Nutrition Risk Manual

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101 Underweight Women

Definition/Cut-Off Value:

Pregnant Women

- Pre-pregnancy Body Mass Index (BMI) < 18.5

Not Breastfeeding woman

- Current or Pre-Pregnancy Body Mass Index (BMI) < 18.5

Breastfeeding Women Who Are < 6 Months Postpartum

- Current or Pre-Pregnancy Body Mass Index (BMI) < 18.5

Breastfeeding Women Who Are > or equal to 6 Months Postpartum

- Current Body Mass Index (BMI) < 18.5

Note: A BMI table is included in this section to assist in determining weight classification. Also, until research supports the use of different BMI cut-offs to determine weight status categories for adolescent pregnancies, the same BMI cut-offs will be used for all women, regardless of age, when determining WIC eligibility.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Auto Assignment

Will be auto assigned if pre-pregnancy BMI is < 18.5
Will be auto assigned for Not Breastfeedingand breastfeeding women < 6 months postpartum if pre-pregnancy BMI is < 18.5
Will be auto assigned for breastfeeding women ≥ 6 months postpartum if current BMI < 18.5

Justification

Underweight women who become pregnant are at a higher risk for delivery of low-birth weight (LBW) infants, retarded fetal growth, and perinatal mortality. Pre-pregnancy underweight is also associated with a higher incidence of various pregnancy complications such as antepartum hemorrhage, premature rupture of membranes, anemia, endometriosis, and cesarean delivery.

The goal in prenatal nutritional counseling provided by WIC is to achieve recommended weight gain by emphasizing food choices of high nutritional quality; and for the underweight woman, by encouraging increased consumption and/or the inclusion of some calorically dense foods.

The 2009 Institute of Medicine (IOM) report: *Weight Gain during Pregnancy: Reexamining the Guidelines* (1) updated the pregnancy weight categories to conform to the categories developed by the World Health Organization and adopted by the National Heart, Lung and Blood Institute in 1998 (3). The reexamination of the guidelines consisted of a review of the determinants of a wide range of short and long term consequences of variation in weight gain during pregnancy for both the mother and her infant. The IOM prenatal weight gain recommendations based on pre-pregnancy weight status categories are associated with improved maternal and child health outcomes (1).

Included in the 2009 IOM guidelines is the recommendation that the BMI weight categories used for adult women be used for pregnant adolescents as well. More research is needed to determine whether special categories are needed for adolescents. It is recognized that both the IOM cut-offs for defining weight categories will classify some adolescents differently than the CDC BMI-for-age charts. For the purpose of WIC eligibility determination, the IOM cut-offs will be used for all women regardless of age. However, due to the lack of research on relevant BMI cut-offs for pregnant and postpartum adolescents, professionals should use all of the tools available to them to assess these applicants' anthropometric status and tailor nutrition counseling accordingly.

Weight during the early postpartum period, when most WIC certifications occur, is very unstable. During the first 4-6 weeks fluid shifts and tissue changes cause fluctuations in weight. After 6 weeks, weight loss varies among women. Pre-pregnancy weight, amount of weight gain during pregnancy, race, age, parity and lactation all influence the rate of postpartum weight loss. By 6 months postpartum, body weight is more stable and should be close to the pre-pregnancy weight. In most cases, therefore, pre-pregnancy weight is a better indicator of weight status than postpartum weight in the first 6 months after delivery. The one exception is the woman with a BMI of < 18.5 during the immediate 6 months after delivery. Underweight at this stage may indicate inadequate weight gain during pregnancy, depression, an eating disorder or disease; any of which need to be addressed.

While being on the lean side of normal weight is generally considered healthy, being underweight can be indicative of poor nutritional status, inadequate food consumption, and/or an underlying medical condition. Underweight women who are breastfeeding may be further impacting their own nutritional status. Should she become pregnant again, an underweight woman is at a higher risk for delivery of low birth weight (LBW) infants, retarded fetal growth, and perinatal mortality. The role of the WIC Program is to assist underweight women in the achievement of a healthy dietary intake and body mass index.

Justification for High Risk

Not applicable

Additional Counseling Guidelines

Pregnant Participants

- Inform of risks to infant, such as:
  - Low-birth weight
  - Fetal growth restriction
  - Perinatal mortality
  - Pre-term delivery
- Inform of risks to mother, such as:
  - Antepartum hemorrhage
  - Premature rupture of membranes
  - Anemia
  - Endometritis
  - Cesarean delivery

BMI Table for Determining Weight Classification for Women (1)				
Height (Inches)	**Underweight BMI <18.5**	**Normal Weight BMI 18.5-24.9**	**Overweight BMI 25.0-29.9**	**Obese BMI > 30.0**
58”	<89 lbs	89-118 lbs	119-142 lbs	>142 lbs
59”	<92 lbs	92-123 lbs	124-147 lbs	>147 lbs
60”	<95 lbs	95-127 lbs	128-152 lbs	>152 lbs
61”	<98 lbs	98-131 lbs	132-157 lbs	>157 lbs
62”	<101 lbs	101-135 lbs	136-163 lbs	>163 lbs
63”	<105 lbs	105-140 lbs	141-168 lbs	>168 lbs
64”	<108 lbs	108-144 lbs	145-173 lbs	>173 lbs
65”	<111 lbs	111-149 lbs	150-179 lbs	>179 lbs
66”	<115 lbs	115-154 lbs	155-185 lbs	>185 lbs
67”	<118 lbs	118-158 lbs	159-190 lbs	>190 lbs
68”	<122 lbs	122-163 lbs	164-196 lbs	>196 lbs
69”	<125 lbs	125-168 lbs	169-202 lbs	>202 lbs
70”	<129 lbs	129-173 lbs	174-208 lbs	>208 lbs
71”	<133 lbs	133-178 lbs	179-214 lbs	>214 lbs
72”	<137 lbs	137-183 lbs	184-220 lbs	>220 lbs
(1) Adapted from the Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults. National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health (NIH). NIH Publication No. 98-4083.				

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6. Siega-Riz AM, Adair LS, Hobel CJ. "Institute of Medicine maternal weight gain recommendations and pregnancy outcomes in a predominately Hispanic population." *Obstet Gynecol*, 1994; 84:565-73.

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103 Underweight or At Risk of Underweight (Infants and Children)

Definition/Cut-Off Value*:*

Underweight and at risk of underweight are defined as follows:

At Risk of Underweight

- Birth to <24 months:
- >2.3rd and ≤ 5th percentile weight-for-length as plotted on the Centers for Disease Control and Prevention (CDC) Birth to 24 months gender specific growth charts (1).*****

- 2-5 years:
- >5th and ≤ 10th percentile Body Mass Index (BMI)-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).******

Underweight

- Birth to <24 months:
- ≤ 2.3rd percentile weight-for-length as plotted on the CDC Birth to 24 months gender specific growth charts (1).*****

- 2-5 years:
- ≤ 5th and percentile Body Mass Index (BMI)-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).******

*****Based on 2006 World Health Organization international growth standards (3). For the birth to < 24 months "underweight" definition, CDC labels the 2.3rd percentile as the 2nd percentile on the birth to 24 months gender specific growth charts. For more information about the percentile cut-off, please see clarification.

****** Based on National Center for Health Statistics/Centers for Disease Control and Prevention (2000) age/sex specific growth charts

Note: The birth to 24 months and the 2000 CDC growth charts are available at: www.cdc.gov/growthcharts.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	≤ 2.3rd %ile
Children	III	N

Parameters for Auto Assignment

At Risk of Underweight

- Will be auto assigned for infants and children < 24 months if weight-for-length is > 2.3rd and ≤ 5th percentile.
- Will be auto assigned for children if BMI-for-age is > 5th and ≤ 10th percentile.

Underweight

- Will be auto assigned for infants and children < 24 months if weight-for-length is ≤ 2.3rd percentile.
- Will be auto assigned for children if BMI-for-age is ≤ 5th percentile.

High Risk Flag

The high risk designation will automatically activate for infants when 103b risk factor is assigned.

Justification

The CDC uses the 2.3rd percentile weight-for-length (for birth to 24 months of age) and the 5th percentile BMI-for-age (for 2-5 years of age), as the cut-offs to define underweight in its Pediatric Nutrition Surveillance System (1, 2). However, CDC does not have a position regarding the cut-off percentile, which should be used to determine at risk of underweight as a nutrition risk in the WIC Program. At risk of underweight is included in this criterion to reflect the preventive emphasis of the WIC Program.

A review of literature on weight-for-length or stature cut-off percentiles indicates that: a) many children at or below the 5th percentile for weight are in need of nutritional intervention, and b) those at or below the 10th percentile may be at nutritional risk and in need of preventive nutritional intervention, or at least further evaluation (4).

Weight-for-length/stature describes body proportionality and is sensitive to acute undernutrition, but can also reflect long-term status (5). Physical growth delay is used as a proxy for the deleterious effects undernutrition can have on immune function, organ development, hormonal function and brain development (6).

Implications for WIC Nutrition Services

Participation in WIC has been associated with improved growth in both weight and height in children (7). An infant or child determined to be underweight at WIC certification should be monitored at

regular intervals during the certification period, as appropriate. Through client-centered counseling, WIC staff can assist families in making nutritionally balanced food choices to promote adequate weight gain. Also, the foods provided by the WIC Program are scientifically-based and intended to address the supplemental nutritional needs of the Program's target population and can be tailored to meet the needs of individual participants.

In addition, WIC staff can greatly assist families by providing referrals to medical providers and other services, if available, in their community. Such resources may provide the recommended medical assessments, to rule out or confirm medical conditions, and offer treatment when necessary and/or in cases where growth improvement is slow to respond to dietary interventions.

Clarification

The cut-off for underweight for infants and children < 24 months is 2.3; however, for ease of use, CDC labels it as the 2nd percentile on the hard copy Birth to 24 months growth charts. Electronic charts should use the 2.3rd percentile as the cut-off.

Justification for High Risk

Early detection of low BMI for age, along with prompt improvement in BMI, is likely to be the most effective intervention for preventing growth stunting. Prevention of stunting is most crucial during the first two years of life as it may be irreversible. Low adult height and lower birth weight may also be associated with stunting occurring within the first two years of a child's life (1). Stunting is found to be the strongest predictor of developmental outcome, specifically predicting the initial developmental status and the speed at which new skills are accomplished. Stunting has such a strong influence on development and is the outcome of chronic under-nutrition (2).

In addition to poor growth from under-nutrition, children are also at greater risk of infection when they don't receive adequate nutrients. Prevalence, severity and frequency of infections depend upon several factors including infant and young child feeding habits, nutritional status of the child and environmental hygiene. Failure to increase nutrients and calories by introducing complementary foods too late can also contribute to under-nutrition and underweight (5).

Under-nutrition is the cause for half of all child deaths worldwide. Insufficient nutrient intake and infection are the main factors which contribute to this statistic, as inadequate nutrient intake leads to deterioration of the immune system. This further results in an exacerbation of the problem since the infection can further interfere with nutrient absorption (3).

A major reduction in undernutrition can be achieved through supportive health programs and nutrition intervention (3). Lower education levels of parents increase the probability that a child will be underweight, which increases the need for sufficient parental nutrient related education (4). The WIC nutritionist can help improve the nutritional status of children by providing individual counseling and food package tailoring.

Additional Counseling Guidelines

- Discuss issues which may affect participant's weight status, such as:
  - parental body composition
  - recent illnesses
  - developmental delays
  - thyroid abnormalities
- Provide ideas for increasing calories if needed such as:
  - Discuss introducing complementary foods at the appropriate times
  - Providing more frequent snacks or meals
  - Increase use of energy dense foods
- Improve primary caregivers overall nutrient related knowledge
  - Assess caregivers' ability to determine child's energy needs and hunger cues
  - Provide nutrition education/materials specific to participant's children

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4. Nahar B, Ahmed T, Brown KH, Hossain MI. "Risk factors associated with severe underweight among young children reporting to a diarrhea treatment facility in Bangladesh." *J Health Popul Nutr*. 2010; 28(5):476-483.

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111 Overweight Women

Definition/Cut-Off Value:

Pregnant Women

- pre-pregnancy Body Mass Index (BMI) ≥ 25

Not Breastfeeding woman

- pre-pregnancy Body Mass Index (BMI) ≥ 25

Breastfeeding Women less than 6 Months Postpartum

- pre-pregnancy Body Mass Index (BMI) ≥ 25

Breastfeeding Women 6 months postpartum or more

- current Body Mass Index (BMI) ≥ 25

Note: A BMI table is attached to assist in determining weight classifications which can be found in risk factor 101, 131, or 133. Also, until research supports the use of different BMI cut-offs for adolescent pregnancies, the same BMI cut-offs will be used for all women, regardless of age, when determining WIC eligibility (1). (See Justification for a more detailed explanation.)

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding Women	I	N
Not Breastfeeding woman	VI	N

Parameters for Auto Assignment

Auto assigned for pregnant women when pre-pregnancy BMI ≥ 25

Auto assigned for Not Breastfeedingand breastfeeding women who are less than 6 months postpartum when the pre-pregnancy BMI is ≥ 25

Auto assigned for breastfeeding women who are ≥ 6 months postpartum when the current BMI is ≥ 25

Justification

Maternal overweight and obesity are associated with higher rates of cesarean delivery, gestational diabetes mellitus, preeclampsia and other pregnancy-induced hypertensive disorders, as well as postpartum anemia (2). Several studies have established an association between obesity and an increased risk for hypertension, dyslipidemia, diabetes mellitus, cholelithiasis, coronary heart disease, osteoarthritis, sleep apnea, stroke and certain cancers (1).

One goal of prenatal nutritional counseling is to achieve recommended weight gain. For the overweight woman, emphasis should be on selecting food choices of high nutritional quality and avoiding calorie rich foods, thereby minimizing further risks associated with increased overweight and obesity.

The 2009 Institute of Medicine (IOM) report: *Weight Gain During Pregnancy: Reexamining the Guidelines* (1) updated the pregnancy weight categories to conform to the categories developed by the World Health Organization and adopted by the National Heart, Lung and Blood Institute in 1998 (3). The reexamination of the guidelines consisted of a review of the determinants of a wide range of short-and long-term consequences of variation in weight gain during pregnancy for both the mother and her infant. The IOM prenatal weight gain recommendations based on pre-pregnancy weight status categories are associated with improved maternal and child health outcomes (1).

Included in the 2009 IOM guidelines is the recommendation that the BMI weight categories used for adult women be used for pregnant adolescents as well. More research is needed to determine whether special categories are needed for adolescents. It is recognized that the IOM cut-offs for defining weight categories will classify some adolescents differently than the CDC BMI-for-age charts. For the purpose of WIC eligibility determination, the IOM cut-offs will be used for all women regardless of age. However, due to the lack of research on relevant BMI cut-offs for pregnant and postpartum adolescents, professionals should use all tools available to them to assess these applicants' anthropometric status and tailor nutrition counseling accordingly.

Weight during the early postpartum period, when most WIC certifications occur, is very unstable. During the first 4-6 weeks fluid shifts and tissue changes cause fluctuations in weight. After 6 weeks, weight loss varies among women. Pre-pregnancy weight, amount of weight gain during pregnancy, race, age, parity and lactation all influence the rate of postpartum weight loss. By 6 months postpartum, body weight is more stable and should be close to the pre-pregnancy weight. In most cases, therefore, pre-pregnancy weight is a better indicator of weight status than postpartum weight in the first 6 months after delivery (4).

The percentage of adolescents who are overweight is increasing rapidly and more than 60% of adults in the US are overweight. Due to the significant impact that overweight and obesity have on morbidity and mortality, it is imperative that every effort be made to identify individuals who are overweight and to assist them in achieving a more healthful weight. The WIC Program is in a position to play an important role in helping to reduce the prevalence of overweight not only by

working with postpartum women on improving their own weight status, but also by helping them to see their role in assisting their children to learn healthful eating and physical activity behaviors.

Justification for High Risk

Not applicable

Additional Counseling Guidelines

Pregnant Participants

- Inform of increased risks, such as:
  - Diabetes Mellitus
  - Hypertension
  - Blood Clots
  - Pre-term Birth
  - Macrosomia
  - Difficult Labor
  - Complications with C-Section
- Explain that weight loss is not recommended during pregnancy
  - However, pregnancy is a good time to focus on healthy dietary and physical activity behaviors.

References

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113 Obese (Children 2-5 Years of Age)

Definition/Cut-Off Value:

Obesity for children 2-5 years of age is defined as follows:

2 to 5 years of age and ≥ 95th percentile Body Mass Index (BMI) or weight-for-stature as plotted on the 2000 Centers for Disease Control and Prevention (CDC) 2-20 years gender specific growth charts (1,2) (available at: www.cdc.gov/growthcharts).*

**The cut off is based on standing height measurements. Therefore, recumbent length measurements may not be used to determine this risk. See Clarification for more information*.

Participant Category and Priority Level

Category	Priority	High Risk
Children (2-5 years of age)	III	N

Parameters for Auto Assignment

Auto assigned if weight-for-length (for children with a recumbent length) or BMI-for-age is ≥ 95th percentile

Justification

One of the most important public health issues in the United States today is the rapid and significant increase in the prevalence of obesity in children and adolescents. The National Health and Nutrition Examination Survey (NHANES) from the mid-1960s to the early 2000s document this significant increase in obesity among children from preschool age through adolescence. These trends parallel a concurrent increase in obesity among adults, suggesting that fundamental shifts occurring in dietary and/or physical activity behaviors are having an adverse effect on overall energy balance (3).

The causes of increased obesity rates in the United States are complex. Both genetic make-up and environmental factors contribute to the obesity risk. Important contributors include a large and growing abundance of calorically dense foods and an increased sedentary lifestyle for all ages. Although obesity tends to run in families, a genetic predisposition does not inevitably result in obesity. Environmental and behavioral factors can influence the development of obesity in genetically at-risk people (3).

BMI is a measure of body weight adjusted for height. While not a direct measure of body fatness, BMI is a useful screening tool to assess adiposity (3). Children >2 years of age, with a BMI-for-age >85th and <95th percentile are considered *overweight* and those at or above the 95th percentile,

obese (4). Research on BMI and body fatness shows that the majority of children with BMI-for-age at or above the 95th percentile have high adiposity and less than one-half of the children in the 85th to <95th percentiles have high adiposity (4). Although an imperfect tool, elevated BMI among children most often indicates increased risk for future adverse health outcomes and/or development of diseases (5). BMI should serve as the initial screen and as the starting point for classification of health risks (3).

Use of the 95th percentile to define obesity identifies those children with a greater likelihood of being obese as adolescents and adults, with increased risk of obesity-related disease and mortality. It is recommended that an obese child (≥95th percentile) undergo a medical assessment and careful evaluation to identify any underlying health risks or secondary complications (3). Obesity can result from excessive energy intake, decreased energy expenditure, or a medical condition that impairs the regulation of energy metabolism. In addition, obesity in early childhood may signify problematic feeding practices or evolving family behaviors that, if continued, may contribute to health risks in adulthood related to diet and inactivity.

Justification for High Risk

Not applicable

Implications for WIC Nutrition Services

The WIC Program plays an important role in public health efforts to reduce the prevalence of obesity by actively identifying and enrolling young children who may be obese or at risk of overweight/obesity in later childhood or adolescence. When identifying this risk, it is important to communicate with parents/caregivers in a way that is supportive and nonjudgmental, and with a careful choice of words that convey an empathetic attitude and minimize embarrassment or harm to a child's self-esteem (4). In recognition of the importance of language, the 2007 American Medical Association Expert Committee Report recommends the use of the terms *overweight* and *obese* for documentation and risk assessment **only** and the use of more neutral terms (e.g., *weight disproportional to height, excess weight, BMI*) when discussing a child's weight with a parent/caregiver (3).

BMI is calculated and plotted on growth charts at each WIC certification. However, growth charts are meant to be used as a screening tool and comprise only one aspect of the overall growth assessment. A clinical assessment to determine if a child is at a healthy weight is more complex. Weight classification (derived from the growth chart) should be integrated with the growth pattern, familial obesity, medical risks, and dietary and physical activity habits to determine the child's obesity risk (1, 5).

The goal in WIC nutrition counseling is to help the child achieve recommended rates of growth and development. WIC staff can frame the discussion to make achieving normal growth a shared goal of the WIC Program and the parent/caregiver and make clear that obesity is a medical condition that can be addressed (4). Parents/caregivers of children may need education on recognition of satiety cues and other physiological needs that lead to crying, and ways to comfort a child (holding, reading,

rocking) other than by feeding. The foods provided by the WIC Program are scientifically-based and intended to address the supplemental nutritional needs of the Program's target population and can be tailored to meet the needs of individual participants. Emphasis can be placed on promoting food choices of high nutritional quality while avoiding unnecessary or excessive amounts of calorie rich foods and beverages and reducing inactivity (like decreasing sedentary TV viewing).

Beliefs about what is an attractive or healthy weight, the importance of physical activity, what foods are desirable or appropriate for parents to provide to children, family mealtime routines, and many other lifestyle habits are influenced by different cultures, and should be considered during the nutrition assessment and counseling (6). The following resources for obesity prevention can be found at:

• Fit WIC Materials: http://www.nal.usda.gov/wicworks/Sharing_Center/gallery/families.html

• MyPryramid for Preschoolers: http://www.mypyramid.gov/preschoolers/index.html

In addition, WIC staff can greatly assist families by providing referrals to medical providers and other services, if available, in their community. Such resources may provide the recommended medical assessments, in order to rule out or confirm medical conditions, and offer treatment when necessary and/or in cases where growth improvement is slow to respond to dietary interventions.

Clarification

The 2000 CDC Birth to 36 months growth charts **cannot** be used as a screening tool for the purpose of assigning this risk because these charts are based on recumbent length rather than standing height data. However, these charts may be used as an assessment tool for evaluating growth in children aged 24-36 months who are not able to be measured for the standing height required for the 2000 CDC 2-20 years growth charts.

Additional Counseling Guidelines

- First step in weight control for most overweight children is not weight loss
  - Goal should be to maintain baseline weight or to gain weight at a slower rate
- Weight goals can be achieved through modest changes in diet and activity
  - Avoid short-term diets or physical activity programs that promote rapid weight loss rather than long-term changes
  - Emphasize the importance of the whole family making changes—not just the participant who is overweight!
  - Help caregivers to teach and model healthy attitudes toward food and physical activity without emphasizing body weight
- Help participant pick one or two goals to work on
  - Start slowly, and help participant monitor changes and progress
  - Suggested Diet Behavior goals could include:
    - healthy eating habits

- eating three meals per day and choosing healthy, low-calorie snacks
- modestly reducing fat in the family's diet (Don't restrict fat in children less than 2 years of age.)
- drinking low fat and nonfat milk after the age of 2
- limiting the consumption of high sugar foods like soda and juice (Do not forbid sweets and desserts. Emphasize moderation.)
- being aware of portion sizes, especially high fat and high sugar foods
- limit the frequency of high calorie fast food meals
- eating a variety of foods by introducing new foods often
- drinking more water
- engaging in physical activities that the whole family enjoys
- reducing the time in front of the TV (Limit TV and computer games to no more than 1 to 2 hours per day)

References

1. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. CDC growth charts: United States. Advance data from vital and health statistics; no. 314. Hyattsville (MD): National Center for Health Statistics. 2000.

2. Grummer-Strawn LM, Reinold C, Krebs NF. Use of World Health Organization and CDC growth charts for children aged 0-59 Months in the United States. CDC Morbidity and Mortality Weekly Report (September 2010); no 59(rr09); 1-15. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5909a1.htm?s_cid=rr5909a1_w. Accessed September 2010.

3. Barlow SE, Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. Pediatrics. 2007; 120; S164-S192.

4. Ogden CL, Flegal KM. Changes in Terminology for Childhood Overweight and Obesity. National health statistics reports; no. 25. Hyattsville (MD): National Center for Health Statistics. 2010.

5. U.S. Department of Health and Human Services. The Surgeon General's vision for a healthy and fit nation. Rockville (MD): U.S. Department of Health and Human Services, Office of the Surgeon General. 2010.

6. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and Adolescent Overweight and Obesity. Pediatrics 2007; 120 Suppl 4: S103-S228.

114 Overweight or At Risk of Overweight (Infants and Children)

Definition/Cut-Off Value:

The risk factors are limited to:

Overweight

- Being 2-5 years of age and ≥ 85th and < 95th percentile Body Mass Index (BMI)-for-age or weight-for-stature as plotted on the 2000 Centers for Disease Control and Prevention (CDC) 2-20 years gender specific growth charts (1,2).*****
- Being < 12 months (infant of obese mother) Biological mother with a BMI ≥ 30 ~~-~~at the time of conception or at any point in the first trimester of the pregnancy.******

At Risk of Overweight

- Being ≥ 12 months (child of obese mother) and having a biological mother with a ~~(~~BMI ≥ 30~~)~~ at the time of the child's certification.** (If the mother is pregnant or has had a baby within the past 6 months, use her preconceptual weight to assess for obesity since her current weight will be influenced by pregnancy-related weight gain.)

- Birth to 5 years (infant or child of obese father) having a biological father with a BMI ≥ 30 at the time of certification.******

****** The cut off is based on standing height measurements. Therefore, recumbent length measurements may not be used to determine this risk. See Clarification for more information.*

******* BMI must be based on self-reported weight and height by the parent in attendance (i.e., one parent may not "self-report" for the other parent) or weight and height measurements taken by staff at the time of certification.*

Note: The 2000 CDC 2 – 20 years growth charts are available at: www.cdc.gov/growthcharts.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	N
Children	III	N

Parameters for Auto Assignment

Auto assigned for children 2-5 years of age when BMI-for-age or weight-for-stature is ≥ 85 and < 95 percentiles.

Auto assigned for infants < 12 months of age when biological mother has a BMI ≥ 30 at time of conception or at any point in the first trimester of the pregnancy.

Auto assigned for children ≥ 12 months of age when biological mother has a BMI ≥ 30 based on the Nutrition Interview.

Auto assigned for infant or child if biological father has a BMI ≥ 30 based on Nutrition Interview.

Justification

The rise in the prevalence of overweight and obesity in children and adolescents is one of the most important public health issues in the United States today. The National Health and Nutrition Examination Survey (NHANES) from the mid-1960s to the early 2000s document a significant increase in overweight among children from preschool age through adolescence. These trends parallel a concurrent increase in obesity among adults, suggesting that fundamental shifts in dietary and/or physical activity behaviors are having an adverse effect on overall energy balance (3).

BMI is a measure of body weight adjusted for height. While not a direct measure of body fatness, BMI is a useful screening tool to assess adiposity (3). Children > 2 years of age, with a BMI-for-age > 85th and < 95th percentile are considered *overweight* and those at or above the 95th percentile, *obese* (4). Research on BMI and body fatness shows that the majority of children with BMI-for-age at or above the 95th percentile have high adiposity and less than one-half of the children in the 85th to < 95th percentiles have high adiposity (4). Although an imperfect tool, elevated BMI among children most often indicates increased risk for future adverse health outcomes and/or development of diseases (5). BMI should serve as the initial screen and as the starting point for classification of health risks (3).

Increasingly, attention is being focused on the need for comprehensive strategies that focus on preventing overweight/obesity and a sedentary lifestyle for all ages. Scientific evidence suggests that the presence of obesity in a parent greatly increases the risk of overweight in preschoolers, even when no other overt signs of increasing body mass are present (6). The presence of parental obesity should lead to greater efforts by nutrition services staff to assist families in establishing or improving healthy behaviors (3).

Justification for High Risk

Not applicable

Implications for WIC Nutrition Services

The WIC Program plays an important role in public health efforts to reduce the prevalence of obesity by actively identifying and enrolling infants and children who may be overweight or at risk of

overweight in childhood or adolescence. When identifying this risk, it is important to communicate it in a way that is supportive, nonjudgmental, and with a careful choice of words to convey an empathetic attitude and to minimize embarrassment or harm to a child's self-esteem (4). In recognition of the importance of language, the 2007 American Medical Association expert committee report recommends the use of the terms *overweight* and *obese* for documentation and risk assessment **only** and the use of more neutral terms (e.g., *weight disproportional to height, excess weight, BMI*) when discussing a child's weight with a parent/caregiver (3).

BMI is calculated and plotted on growth charts at each WIC certification. However, growth charts are meant to be used as a screening tool and comprise only one aspect of the overall growth assessment. A clinical assessment to determine if a child is at a healthy weight is more complex. Weight classification (derived from the growth chart) should be integrated with the growth pattern, familial obesity, medical risks, and dietary and physical activity habits to determine the child's obesity risk (1,5).

The goal in WIC nutrition counseling is to help the child achieve recommended rates of growth and development. WIC staff can frame the discussion to make achieving normal growth a shared goal of the WIC Program and the parent/caregiver. Studies have shown that the early childhood eating environment provides a great opportunity for preventive intervention (7). Parents/caregivers of infants and toddlers may need education on recognition of satiety cues and other physiological needs that lead to crying, and ways to comfort a child (holding, reading, rocking) other than by feeding. Young children look upon their parents as role models for eating behaviors. Through client-centered counseling, WIC staff can emphasize the importance of prevention and can assist families in making changes that improve parenting skills that promote healthy eating, and physical activity behaviors and a healthy weight in children. Also, the foods provided by the WIC Program are scientifically-based and intended to address the supplemental nutritional needs of the Program's target population and can be tailored to meet the needs of individual participants.

Beliefs about what is an attractive or healthy weight, the importance of physical activity, what foods are desirable or appropriate for parents to provide to children, family mealtime routines, and many other lifestyle habits are influenced by different cultures, and should be considered during the nutrition assessment and counseling (8). The following resources for obesity prevention can be found at:

• Fit WIC Materials: http://www.nal.usda.gov/wicworks/Sharing_Center/gallery/foodfunfamilies.htm.

• MyPryramid for Preschoolers: http://www.mypyramid.gov/preschoolers/index.html

In addition, WIC staff can greatly assist families by providing referrals to medical providers and other services, if available, in their community. Such resources may provide the recommended medical assessments, in order to rule out or confirm medical conditions, and offer treatment when necessary and/or in cases where growth improvement is slow to respond to dietary interventions.

Clarification

The 2000 CDC Birth to 36 months growth charts **cannot** be used as a screening tool for the purpose of assigning this risk because these charts are based on recumbent length rather than standing height data. However, these charts may be used as an assessment tool for evaluating growth in children aged 24-36 months who are not able to be measured for the standing height required for the 2000 CDC 2-20 years growth charts.

Additional Counseling Guidelines

- First step in weight control for most overweight children is not weight loss
  - Goal should be to maintain baseline weight or to gain weight at a slower rate
- Weight goals can be achieved through modest changes in diet and activity
  - Avoid short-term diets or physical activity programs that promote rapid weight loss rather than long-term changes
  - Emphasize the importance of the whole family making changes—not just the participant who is overweight!
  - Help caregivers to teach and model healthy attitudes toward food and physical activity without emphasizing body weight
- Help participant pick one or two goals to work on
  - Start slowly, and help participant monitor changes and progress
  - Suggested goals could include:
    - Improving healthy eating habits
    - Eating three meals per day and choosing healthy, low-calorie snacks
    - Modestly reducing fat in the family's diet (Don't restrict fat in children less than 2 years of age.)
    - Drinking low fat and nonfat milk after the age of 2
    - Limiting the consumption of high sugar foods like soda and juice (Do not forbid sweets and desserts. Emphasize moderation.)
    - Being aware of portion sizes, especially high fat and high sugar foods
    - Limit the frequency of high calorie fast food meals
    - Eating a variety of foods by introducing new foods often
    - Drinking more water
    - Engaging in physical activities that the whole family enjoys
    - Reducing the time in front of the TV (Limit TV and computer games to no more than 1 to 2 hours per day.)

References

1. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. CDC growth charts: United States. Advance data from vital and health statistics; no. 314. Hyattsville, Maryland: National Center for Health Statistics. 2000.

2. Grummer-Strawn LM, Reinold C, Krebs NF. Use of World Health Organization and CDC growth charts for children aged 0-59 Months in the United States. CDC Morbidity and Mortality Weekly Report (September 2010); no 59(rr09); 1-15. Available at:

http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5909a1.htm?s_cid=rr5909a1_w. Accessed September 2010.

3. Barlow SE, Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. Pediatrics. 2007; 120; S164-S192.
4. Ogden CL, Flegal KM. Changes in Terminology for childhood overweight and obesity. National health statistics reports; no. 25. Hyattsville (MD): National Center for Health Statistics. 2010.
5. U.S. Department of Health and Human Services. The Surgeon General's vision for a healthy and fit nation. Rockville (MD): U.S. Department of Health and Human Services, Office of the Surgeon General. 2010.
6. Whitaker RC, Wright JA, Pepe MS, Seidel KD, Dietz WH. Predicting obesity in young adulthood from childhood and parental obesity. NEJM, Vol 337, No 13, September 25, 1997. pgs. 869-873.
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8. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. Pediatrics 2007; 120 Suppl 4: S103-S228.

Abbreviated Body Mass Index (BMI) Table

* This table may be used to determine paternal (male or female) obesity (BMI ≥ 30).

Height	Inches	Weight (lbs) equal to BMI 30
4’ 10”	58	143
4’ 11”	59	148
5’ 0”	60	153
5’ 1”	61	158
5 2”	62	164
5’ 3”	63	169
5’ 4”	64	174
5’ 5”	65	180
5’ 6”	66	186
5’ 7”	67	191
5’ 8”	68	197
5’ 9”	69	203
5’ 10”	70	209
5’ 11”	71	215
6’ 0”	72	221
6’ 1”	73	227
6’ 2”	74	233
6’ 3”	75	240

Source: Evidence Report of Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, 1998. National Institutes of Health/National Heart, Lung, and Blood Institute (NHLBI).

Note: A complete BMI table is available on the NHLBI website: www.nhlbi.gov/guidelines/obesity/ob_home/htm

115 High Weight-for-Length (Infants and Children < 24 Months of Age)

Definition/Cut-Off Value:

High weight-for-length for infants and children < 24 months of age is defined as follows:

Birth to < 24 months having ≥ 97.7th percentile weight-for-length as plotted on the Centers for Disease Control and Prevention (CDC), Birth to 24 months gender specific growth charts (1) (available at: www.cdc.gov/growthcharts).*

**Based on the 2006 World Health Organization (WHO) international growth standards (2). CDC labels the 97.7th percentile as the 98th percentile on the Birth to 24 months gender specific growth charts. For more information about the percentile cut-off, please see Clarification.*

Participant Category and Priority Level

Category	Priority	Risk
Infants	I	N
Children (< 24 months of age)	III	N

Justification

In 2006, WHO released international growth standards for infants and children aged 0-59 months (2), similar to the 2000 CDC growth references. Since then, the CDC has developed Birth to 24 months growth charts, based on the WHO growth standards, and recommends their use in the United States (1). For persons 2-20 years, the 2000 CDC growth charts will continue to be used (1).

The WHO and CDC growth charts are similar in that both describe weight-for-age, length (or stature)-for-age, weight-for-length (or stature) and body mass index (BMI) for age. However, they differ in the approach taken to create the growth charts. The WHO growth charts are growth standards that describe how healthy children grow under optimal environmental and health conditions. The 2000 CDC charts are a growth reference, not a standard, and describe how certain children grew in a particular place and time (2).

The WHO growth standards for children < 24 months are based on data collected from 1997-2003 in 6 countries (including the U.S.), from children who were born between 37 and 42 weeks gestation, breastfed for at least 12 months, and introduced to complementary food by at least 6 months but not before 4 months. Infants and children of low-income mothers and/or mothers who smoked were not included in the data sample (2).

The 2000 CDC charts for infants and children < 36 months are based on birth weight (from 1968 to 1980 and from 1985 to 1994) and birth length data (from 1989 to1994) obtained from U.S. birth certificates; National Health and Nutrition Examination Survey (NHANES) data; and measurements

from infants who had been breastfed and formula fed (approximately 50% ever breastfed and approximately 33% who were still breastfeeding at 3 months). Very low birth weight infants were not included in the sample population. This was the only exclusion criterion applied to the sample population (2, 3).

Prior to making its recommendation, CDC convened an Expert Panel with the National Institutes of Health and the American Academy of Pediatrics to review the scientific evidence and discuss the potential use of the WHO growth standards in the U.S. The recommendation to use WHO growth standards for infants and children < 24 months was made on the basis of input from the Expert Panel. In addition, CDC concluded that the WHO growth standards are based on a high-quality study and, since breastfeeding is the recommended infant feeding practice, it is appropriate to use the breastfed infant as the standard against which all other infants are compared (2).

The WHO growth standards use values of 2 standard deviations away from the median to identify children whose growth might be indicative of adverse health conditions (1). The CDC Birth to 24 months growth charts (based on the WHO growth standards) labels 2 standard deviations above the median as the 97.7th percentile. Thus, an infant or child (< 24 months) is categorized as high weight-for-length when plotted at or above the 97.7th percentile, labeled as the 98th percentile on the CDC Birth to 24 months growth charts. The CDC recommends that all infants and children < 24 months be assessed using the CDC Birth to 24 months growth charts regardless of type of feeding (formula or breastfed) (2). (See Clarification for information about standard deviations and the cut-off used to determine high weight-for-length.)

Implications for WIC Nutrition Services

The WIC Program plays an important role in public health efforts to reduce the prevalence of obesity by actively identifying and enrolling infants and young children who may be at risk of overweight/obesity in later childhood or adolescence. When identifying this risk, it is important to communicate with parents/caregivers in a way that is supportive and nonjudgmental, and with a careful choice of words that convey an empathetic attitude and minimize embarrassment or harm to a child's self-esteem (4). In recognition of the importance of language, the 2007 American Medical Association Expert Committee Report recommends the use of more neutral terms such as *weight disproportional to height, excess weight*, and *high weight-for-length* when communicating with a parent/caregiver (5).

Height and weight measurements are plotted on growth charts at each WIC certification. However, growth charts are meant to be used as a screening tool and comprise only one aspect of the overall growth assessment. A clinical assessment to determine if a child is at a healthy weight is more complex. Weight classification (derived from the growth chart) should be integrated with the growth pattern, familial obesity, medical risks, and dietary and physical activity habits to determine the child's obesity risk (3, 6).

The goal in WIC nutrition counseling is to help the child achieve recommended rates of growth and development. WIC staff can frame the discussion to make achieving normal growth a shared goal of the WIC Program and the parent/caregiver. Studies have shown that the early childhood eating environment provides a great opportunity for preventive intervention (7). Parents/caregivers of infants and toddlers may need education on recognition of satiety cues and other physiological needs that lead to crying, and ways to comfort a child (holding, reading, rocking) other than by feeding. Young children look upon their parents as role models for eating behaviors. Through client-centered counseling, WIC staff can emphasize the importance of prevention and can assist families in making changes that improve parenting skills that promote healthy eating, physical activity behaviors and a healthy weight in children. Also, the foods provided by the WIC Program are scientifically-based and intended to address the supplemental nutritional needs of the Program's target population and can be tailored to meet the needs of individual participants.

Beliefs about what is an attractive or healthy weight, the importance of physical activity, what foods are desirable or appropriate for parents to provide to children, family mealtime routines, and many other lifestyle habits are influenced by different cultures, and should be considered during the nutrition assessment and counseling (8). The following resources for obesity prevention can be found at:

Fit WIC Materials: http://www.nal.usda.gov/wicworks/Sharing_Center/gallery/families.html

MyPryramid for Preschoolers: http://www.mypyramid.gov/preschoolers/index.html.

In addition, WIC staff can greatly assist families by providing referrals to medical providers and other services, if available, in their community. Such resources may provide the recommended medical assessments, in order to rule out or confirm medical conditions, and offer treatment when necessary and/or in cases where growth improvement is slow to respond to dietary interventions.

Clarification

Standard deviation is a measurement widely used in statistical analysis. It shows how much variation there is from the median. The WHO growth charts use standard deviations to illustrate the proximity of a given child's growth from that of the average child of the same age and gender. For infants and children < 24 months of age, 2 standard deviations above the median indicates high weight-for-length. A measurement of 2 standard deviations below the median indicates underweight. Since most health care providers in the U.S. are more familiar with percentiles, the CDC developed growth charts based on the WHO growth standards, but converted standard deviations into percentile readings. Two standard deviations above the median is the 97.7th percentile; however, for ease of use, CDC labels it as the 98th percentile on the hard copy Birth to 24 months growth charts. Electronic charts should use the 97.7th percentile as the cut-off.

Justification for High Risk

Not applicable

References

1. Centers for Disease Control and Prevention. Use of World Health Organization and CDC growth charts for children aged 0-59 months in the United States. MMWR 2010; 59(No. RR-9). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5909a1.htm?s_cid=rr5909a1_w. Accessed September 2010.
2. World Health Organization. WHO child growth standards: Length/height-for-age, weight-for-age, weight for height and body mass index-for-age: Methods and development. Geneva, Switzerland: World Health Organization; 2006. Available at http://www.who.int/childgrowth/publications/technical_report_pub/en/index.html. Accessed September 2010.
3. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. CDC growth charts: United States. Advance data from vital and health statistics; no. 314. Hyattsville, Maryland: National Center for Health Statistics. 2000.
4. Ogden CL, Flegal KM. Changes in Terminology for childhood overweight and obesity. National health statistics reports; no. 25. Hyattsville (MD): National Center for Health Statistics. 2010.
5. Barlow SE, Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. Pediatrics. 2007; 120; S164-S192.
6. U.S. Department of Health and Human Services. The Surgeon General's vision for a healthy and fit nation. Rockville (MD): U.S. Department of Health and Human Services, Office of the Surgeon General. 2010.
7. Anzman SL, Rolllins BY, Birch LL. Parental influence on children's early eating environments and obesity risk: implications for prevention. International Journal of Obesity 34, 1116-1124 (July 2010).
8. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. Pediatrics 2007; 120 Suppl 4: S103-S228.

121 Short Stature or At Risk of Short Stature (Infants and Children)

Definition/Cut-Off Value:

At Risk of Short Stature

- Birth to <24 months
  > 2.3rd percentile and ≤ 5th percentile length-for-age as plotted on the CDC Birth to 24 months gender specific growth charts (1).*****

- 2-5 years:
  > 5th percentile and ≤ 10th percentile stature-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).

Short Stature

- Birth to <24 months:
  ≤ 2.3rd percentile length-for-age as plotted on the Centers for Disease Control and Prevention (CDC) Birth to 24 months gender specific growth charts (1).*****

- 2-5 years:
  ≤ 5th percentile stature-for-age age as plotted on the 2000 CDC age/gender specific growth charts (2).

**Based on 2006 World Health Organization international growth standards (3). CDC labels the 2.3rd percentile as the 2nd percentile on the Birth to 24 months gender specific growth charts. For more information about the percentile cut-off, please see Clarification.*

Notes: 1. The Birth to 24 months and the 2000 CDC growth charts are available at: www.cdc.gov/growthcharts.

2. For premature infants and children (with a history of prematurity) up to 2 years of age, assignment of this risk criterion will be based on adjusted gestational age. For information about adjusting for gestational age see: Guidelines for Growth Charts and Gestational Age Adjustment for Low Birth Weight and Very Low Birth Weight Infants.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	N
Children	III	N

Parameters for Auto Assignment

At Risk of Short Stature

- Auto assigned for infants and children < 24 months of age if length-for-age is > 2.3rd percentile and ≤ 5th percentile (for premature infants and children < 24 months of age this is based on adjusted gestational age).

- Auto assigned for children 2-5 years if stature-for-age is > 5th percentile and ≤ 10th percentile.

Short Stature

- Auto assigned for infants and children < 24 months of age if length-for-age is ≤ 2.3rd percentile (for premature infants and children < 24 months of age this is based on adjusted gestational age).

- Auto assigned for children 2-5 years if stature-for-age is ≤ 5th percentile.

Justification

The CDC uses the 2.3rd percentile (for birth to 24 months of age) and the 5th percentile (for 2-5 years of age) stature-for-age, as the cut-offs to define short stature in its Pediatric Nutrition Surveillance System (1, 2). However, CDC does not have a position regarding the cut-off percentile which should be used to determine *at risk of short stature* as a nutritional risk in the WIC Program. *At risk of short stature* is included in this criterion to reflect the preventive emphasis of the WIC Program.

Abnormally short stature in infants and children is widely recognized as a response to an inadequate nutrient supply at the cellular level (4). This indicator can help identify children whose growth is stunted due to prolonged undernutrition or repeated illness (3). Short stature is related to a lack of total dietary energy and to poor dietary quality that provides inadequate protein, particularly animal protein, and inadequate amounts of micronutrients such as zinc, vitamin A, iron, copper, iodine, calcium, and phosphorus (4). In these circumstances, maintenance of basic metabolic functions takes precedence, and thus resources are diverted from linear growth.

Demonstrable differences in stature exist among children of different ethnic and racial groups. However, racial and ethnic differences are relatively minor compared with environmental factors (1). Growth patterns of children of racial groups whose short stature has traditionally been attributed to

genetics have been observed to increase in rate and in final height under conditions of improved nutrition (5, 6).

Short stature may also result from disease conditions such as endocrine disturbances, inborn errors of metabolism, intrinsic bone diseases, chromosomal defects, fetal alcohol syndrome, and chronic systemic diseases (4).

Implications for WIC Nutrition Services

Participation in WIC has been associated with improved growth in both weight and height in children (7). A more in-depth dietary assessment and/or referral to a health care provider may be necessary to determine if short stature is a result of dietary inadequacy or a disease condition. Also, more frequent follow-up to monitor growth is appropriate for children in these categories. Through client-centered counseling WIC staff can assist families in improving dietary intake to promote healthy growth and development. In addition, the foods provided by the WIC Program are scientifically-based and intended to address the supplemental nutritional needs of the Program's target population, and can be tailored to meet the needs of individual participants.

In addition, WIC staff can greatly assist families by providing referrals to medical providers and other services, if available, in their community. Such resources may provide the recommended medical assessments, in order to rule out or confirm medical conditions, and offer treatment when necessary and/or in cases where growth improvement is slow to respond to dietary interventions.

Clarification

The cut-off for short stature for infants and children > 24 months is 2.3; however, for ease of use, CDC labels it as the 2nd percentile on the Birth to 24 months hard copy growth charts. Electronic charts should use the 2.3rd percentile as the cut-off.

Justification for High Risk

Not applicable

Additional Counseling Guidelines

- Discuss issues which may affect participant's growth:
    - caloric intake and quality of the diet
    - poverty and food insecurity
    - inadequate knowledge of appropriate diet
    - child neglect or abuse
    - illnesses or diseases which could affect growth
    - prematurity and birth weight
    - parental stature (mother's height may be best indicator)
    - cultural background (black and possibly Asian)
    - altitude

- Review current dietary intake and meal pattern
    - Look for deficiencies in calories, protein (particularly animal protein), zinc, vitamin A, iron, copper, iodine, calcium, and phosphorus

References

1. Centers for Disease Control and Prevention. Use of World Health Organization and CDC growth charts for children aged 0-59 months in the United States. MMWR 2010; 59(No. RR-9). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5909a1.htm?s_cid=rr5909a1_w. Accessed September 2010.
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7. Disbrow DD. The costs and benefits of nutrition services: a literature review. J Am Diet Assoc. 1989; 89: S3-66.

131 Low Maternal Weight Gain

Definition/Cut-Off Value:

Low weight gain at any point in pregnancy, such that using a National Academies of Sciences, Medicine, and Engineering (NASEM - formerly known as the Institute of Medicine)-based weight gain grid, a pregnant woman's weight plots at any point beneath the bottom line of the appropriate weight gain range for her respective pre-pregnancy weight category as follows (1,2):

Pre-pregnancy Weight Classification	BMI	Total Weight Gain Range (lbs)
Underweight	< 18.5	28-40
Normal Weight	18.5 to 24.9	25-35
Overweight	25.0 to 29.9	15-25
Obese	> 30.0	11-20

Multi-fetal Pregnancies: See Justification for information.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N

Parameters for Manual Assignment

To manually assign risk 131, select the radio button 131 in the Anthropometrics panel or select 131 in the Risk panel.

Justification for High Risk

Not applicable

Justification

The amount of weight gained during pregnancy has both immediate and long-term implications for both mother and infant. In the short term, maternal weight gain during the 2nd and 3rd trimesters is an important determinant of fetal growth. In fact, low maternal weight gain is associated with an increased risk of small for gestational age (SGA) infants especially in underweight and normal-weight women. Moreover, it is associated with preterm birth among underweight women and, to a lesser extent, normal weight women. Low maternal weight gain is also associated with failure to initiate breastfeeding. (1)

In the long term, evidence shows that poor maternal nutrition during pregnancy can have permanent, detrimental effects on the child's health in later years. These effects include an increased risk for obesity, impaired glucose tolerance, and cardiovascular disease. Research suggests that early gestation may be a particularly sensitive period wherein inadequate weight gain can have long term impacts on the cardiometabolic health of the child later in life. This most likely results from suboptimal maternal nutrition that affects developing fetal organs thereby leading to permanent alterations. (3)

Nationally representative data indicates that inadequate gestational weight gain is most prevalent among Asian, Hispanic, and black mothers. Furthermore, a multivariable-adjusted analysis of >52,000 women who participated in the 2004–2005 Pregnancy Risk Assessment Monitoring System confirmed that Hispanic, black, and women who identified as "other" regarding race gain significantly less weight than white women after adjusting for pre-pregnancy BMI, age, parity, and education (4). Reports of multivariable-adjusted analyses of both national studies and smaller cohorts since 1980 confirm that black and Hispanic women compared to white women are more likely to have inadequate weight gain as opposed to excessive gestational weight gain (4). Research shows that black women in the U.S. are more likely to gain less than the recommended amount of weight during pregnancy and more likely to lose weight during pregnancy compared to white women (5). Contributing factors include the decreased access that socioeconomically disadvantaged neighborhoods have to vital resources that help ensure the good health of the mother prior to and during pregnancy. Additionally, place of work and exposure to other harmful environments are also factors (6).

The 2009 NASEM prenatal weight gain recommendations based on pre-pregnancy weight status categories are associated with improved maternal and child health outcomes (1). Included in these guidelines' recommendation that the BMI weight categories used for adult women be used for pregnant adolescents as well. More research is needed to determine whether special categories are needed for adolescents. It is recognized that the NASEM cut-offs for defining weight categories will classify some adolescents differently than the CDC BMI-for-age charts. For the purpose of WIC eligibility determination, the NASEM cut-offs will be used for all women regardless of age. However, due to the lack of research on relevant BMI cut-offs for pregnant and postpartum adolescents, professionals should use all tools available to them to assess an individual's anthropometric status and tailor nutrition counseling accordingly.

Multi-fetal Pregnancies

For twin gestations, the NASEM recommendations provide provisional guidelines as follows: normal weight women should gain 37-54 pounds; overweight women, 31-50 pounds; and obese women, 25-42 pounds. There was insufficient information for the NASEM committee to develop even provisional guidelines for underweight women with multiple fetuses (1). However, a consistent rate of weight gain is advisable. A gain of 1.5 pounds per week during the second and third trimesters has been associated with a reduced risk of preterm and low-birth weight delivery in twin pregnancy (7). In triplet pregnancies, the overall gain should be around 50 pounds with a steady rate of gain of approximately 1.5 pounds per week throughout the pregnancy (7). Education by the WIC

nutritionist should address a steady rate of weight gain that is higher than for singleton pregnancies. For WIC nutrition risk assignment, multi-fetal pregnancies are considered a nutrition risk in and of themselves (see Risk 335 - *Multi-Fetal Gestation*), aside from weight gain.

Weight Loss during Pregnancy

Weight loss during pregnancy can result in SGA infants, stillbirth, and neonatal death (8). In addition, surviving children are at risk for poor growth and infection during infancy. Weight loss during pregnancy may indicate underlying dietary or health practices. It may also indicate underlying health or social conditions associated with poor pregnancy outcomes. Common causes of unintended weight loss during pregnancy include food insecurity, substance misuse, housing insecurity, infection, food-borne illness, and symptoms associated with pregnancy such as hyperemesis gravidarum (9). Please refer to Risk 301 - *Hyperemesis Gravidarum* for additional information.

Weight Loss during Pregnancy in Obese Women

The recommended amount of weight gain in obese women during pregnancy remains controversial (10). Research demonstrates that it may be beneficial for the mother, and not harmful for the infant, to lose weight during pregnancy. The benefits of weight loss among obese pregnant women include decreased rates of caesarian delivery, large-for-gestational-age infants, and postpartum weight retention (11). As a result, some scientists are now suggesting that the NASEM recommendations for weight gain in obese pregnant women be re-evaluated (12).

Although controversy remains regarding weight loss during pregnancy among obese women, if a pregnant woman was obese prior to pregnancy, she should follow the advice of her health care provider regarding weight recommendations. For WIC nutrition risk assignments, WIC staff should follow the NASEM recommendations.

Implications for WIC Nutrition Services

WIC services can improve the birth outcomes for women who experience low maternal weight gain during pregnancy. These outcomes can be improved by the supplemental food, nutrition education, and referrals provided to participants by the WIC Program. The WIC food prescription helps provide pregnant women with foods that reflect their nutritional needs during pregnancy. The tailored nutrition education given to pregnant women helps ensure that they receive nutrition support that is relevant to their concerns and lifestyle factors. Staff can assist pregnant women in the following ways:

- Carefully assessing the health status, dietary intake, and concerns of the woman in a participant- centered manner to find out possible factors contributing to low weight gain.
- Encouraging women to eat smaller, more frequent meals with snacks if they are

struggling with appetite or nausea.

- Discussing healthy, high calorie snack options, if appropriate. To include nutrition tailoring of the food package for higher caloric WIC foods, e.g., peanut butter instead of legumes.
- Educating pregnant women on the importance of appropriate weight gain during pregnancy.
- If allowable, providing pregnant women with medical foods as prescribed by their medical provider to support appropriate weight gain.
- Referring to the health care provider if the pregnant woman has been diagnosed with, or is suspected of having, hyperemesis gravidarum.
- Providing additional referrals to health care providers and/or other services based on interests and concerns of the woman.

Additional Counseling Guidelines

- Discuss issues which may affect participant's weight gain:
  - perception of body weight gain
  - adequacy of food in the home
  - pattern of weight gain and birth outcomes in previous pregnancies
  - excessive exercise
  - environmental stressors
  - breastfeeding energy expenditure
- Counsel on ways to improve dietary intake:
  - eat high calorie/nutrient dense foods
  - frequency of meals and snacks
  - improving pregnancy related symptoms (i.e. nausea, vomiting, discomfort)

Clarification

The Centers for Disease Control and Prevention (CDC) defines a trimester as a term of three months in the prenatal gestation period with specific trimesters defined as follows in weeks:

- First Trimester: 0-13 weeks
- Second Trimester: 14-26 weeks
- Third Trimester: 27-40 weeks

Further, CDC begins the calculation of weeks starting with the first day of the last menstrual period. If that date is not available, CDC estimates that date from the estimated date of confinement (EDC). This definition is used in interpreting CDC's Prenatal Nutrition Surveillance System data, comprised primarily of data on pregnant women participating in the WIC Program.

BMI Table for Determining Weight Classification for Women (1)				
Height (Inches)	**Underweight BMI <18.5**	**Normal Weight BMI 18.5-24.9**	**Overweight BMI 25.0-29.9**	**Obese BMI > 30.0**
58”	<89 lbs	89-118 lbs	119-142 lbs	>142 lbs
59”	<92 lbs	92-123 lbs	124-147 lbs	>147 lbs
60”	<95 lbs	95-127 lbs	128-152 lbs	>152 lbs
61”	<98 lbs	98-131 lbs	132-157 lbs	>157 lbs
62”	<101 lbs	101-135 lbs	136-163 lbs	>163 lbs
63”	<105 lbs	105-140 lbs	141-168 lbs	>168 lbs
64”	<108 lbs	108-144 lbs	145-173 lbs	>173 lbs
65”	<111 lbs	111-149 lbs	150-179 lbs	>179 lbs
66”	<115 lbs	115-154 lbs	155-185 lbs	>185 lbs
67”	<118 lbs	118-158 lbs	159-190 lbs	>190 lbs
68”	<122 lbs	122-163 lbs	164-196 lbs	>196 lbs
69”	<125 lbs	125-168 lbs	169-202 lbs	>202 lbs
70”	<129 lbs	129-173 lbs	174-208 lbs	>208 lbs
71”	<133 lbs	133-178 lbs	179-214 lbs	>214 lbs
72”	<137 lbs	137-183 lbs	184-220 lbs	>220 lbs
(1) Adapted from the Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults. National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health (NIH). NIH Publication No. 98-4083.				

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133 High Maternal Weight Gain

Definition/Cut-Off Value:

High weight gain at any point in pregnancy, such that using an Institute of Medicine (IOM)-based weight gain grid, a pregnant woman's weight plots at any point above the top line of the appropriate weight gain range for her respective pre-pregnancy weight category (see below).

Breastfeeding or Not Breastfeeding woman (most recent pregnancy only): total gestational weight gain exceeding the upper limit of the IOM's recommended range based on Body Mass Index (BMI) for singleton pregnancies, as follows:

Pre-pregnancy Weight Groups	Definition	Total Weight Gain
Underweight	BMI < 18.5	> 40 lbs
Normal Weight	BMI 18.5 to 24.9	> 35 lbs
Overweight	BMI 25.0 to 29.9	> 25 lbs
Obese	BMI $\geq$ 30.0	> 20 lbs

Multi-fetal Pregnancies: See Justification for information

Note: A BMI table is attached to assist in determining weight classification. Also, until research supports the use of different BMI cut-offs to determine weight categories for adolescent pregnancies, the same BMI cut-offs will be used for all women, regardless of age, when determining WIC eligibility. (See Justification for a more detailed explanation.)

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding woman	VI	N

Parameters for Auto Assignment

Auto assigned for breastfeeding and Not Breastfeeding woman if Total Weight Gained (in pregnancy record) during the most recent pregnancy exceeds above amounts for their BMI category.

Parameters for Manual Assignment

To manually assign risk 133 for pregnant women, select the radio button 133 in the Anthropometrics panel or select 133 in the Risk Panel.

Justification for High Risk

Not applicable

Justification

Women with excessive gestational weight gains are at increased risk for cesarean delivery and delivering large for gestational age infants that can secondarily lead to complications during labor and delivery. There is a strong association between higher maternal weight gain and both postpartum weight retention and subsequent maternal obesity. High maternal weight gain may be associated with glucose abnormalities and gestational hypertension disorders, but the evidence is inconclusive (1).

Obesity is one of the most important long-term child outcomes related to high maternal weight gain. A small number of relatively large and recent epidemiologic studies show that higher maternal weight gain is associated with childhood obesity as measured by BMI. (1)

The 2009 Institute of Medicine (IOM) report: *Weight Gain During Pregnancy: Reexamining the Guidelines* (1) updated the pregnancy weight categories to conform to the categories developed by the World Health Organization and adopted by the National Heart, Lung and Blood Institute in 1998 (3). The reexamination of the guidelines consisted of a review of the determinants of a wide range of short-and long-term consequences of variation in weight gain during pregnancy for both the mother and her infant. The IOM prenatal weight gain recommendations based on pre-pregnancy weight status categories are associated with improved maternal and child health outcomes (1).

Included in the 2009 IOM guidelines is the recommendation that the BMI weight categories used for adult women be used for pregnant adolescents as well. More research is needed to determine whether special categories are needed for adolescents. It is recognized that the IOM cut-offs for defining weight categories will classify some adolescents differently than the CDC BMI-for-age charts. For the purpose of WIC eligibility determination, the IOM cut-offs will be used for all women regardless of age. However, due to the lack of research on relevant BMI cut-offs for pregnant and postpartum adolescents, professionals should use all tools available to them to assess these applicants' anthropometric status and tailor nutrition counseling accordingly.

For twin gestations, the 2009 IOM recommendations provide provisional guidelines: normal weight women should gain 37-54 pounds; overweight women, 31-50 pounds; and obese women, 25-42 pounds. There was insufficient information for the IOM committee to develop even provisional guidelines for underweight women with multiple

fetuses (1). A consistent rate of weight gain is advisable. A gain of 1.5 pounds per week during the second and third trimesters has been associated with a reduced risk of preterm and low-birth weight delivery in twin pregnancy (4). In triplet pregnancies the overall gain should be around 50 pounds with a steady rate of gain of approximately 1.5 pounds per week throughout the pregnancy (4). Education by the WIC nutritionist should address a steady rate of weight gain that is higher than for singleton pregnancies For WIC eligibility determinations, multi-fetal pregnancies are considered a nutrition risk in and of themselves (Risk #335, Multi-Fetal Gestation), aside from the weight gain issue.

The supplemental foods, nutrition education, and counseling related to the weight gain guidelines provided by the WIC Program may improve maternal weight status and infant outcomes (1). In addition, WIC nutritionists can play an important role, through nutrition education and physical activity promotion, in assisting postpartum women achieve and maintain a healthy weight.

Additional Counseling Guidelines

- Discuss benefits of appropriate weight gain:
  - healthier birth weight baby
  - decreased risk of subsequent obesity
  - less body fat to lose after delivery
  - easier to do physical activities
  - feel better psychologically
- Discuss risks of excessive weight gain:
  - increased risk for delivering high birth weight babies which can lead to complications (see justification section)
    - infants weighing > 9 lbs are at higher risk; > 9.5 lbs at increased mortality risk
  - increased risk of pregnancy induced hypertension, preeclampsia, toxemia
- Discuss ways to improve nutritional intake, such as:
  - decreasing high calorie/low nutrient-dense foods
  - eating more high fiber fruits and vegetables
  - paying attention to portion sizes
  - decreasing frequency of eating, if appropriate
  - low-fat recipes and cooking
  - cultural cooking choices
  - drinking more water
- Address behavioral factors:
  - eating environment (eating in front of the TV)
  - psychological factors (eating when feeling stressed or emotionally upset)
  - cultural factors (body perceptions)
  - substitution behaviors (leave the kitchen area and go outside)
  - “triggers” that stimulate eating (know them and have a plan)
  - participant’s readiness to change

Clarification

The Centers for Disease Control and Prevention (CDC) defines a trimester as a term of three months in the prenatal gestation period with specific trimesters defined as follows in weeks:

- First Trimester: 0-13 weeks
- Second Trimester: 14-26 weeks
- Third Trimester: 27-40 weeks

Further, CDC begins the calculation of weeks starting with the first day of the last menstrual period. If that date is not available, CDC estimates that date from the estimated date of confinement (EDC). This definition is used in interpreting CDC's Prenatal Nutrition Surveillance System data, comprised primarily of data on pregnant women participating in the WIC Program.

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(1) Adapted from the Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults. National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health (NIH). NIH Publication No. 98-4083.				

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134 Failure to Thrive

Definition/Cut-Off Value:

Presence of failure to thrive (FTT) diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Note: For premature infants with a diagnosis of FTT also see: "Guidelines for Growth Charts and Gestational Age Adjustment for Low Birth Weight and Very Low Birth Weight Infants" (FNS Policy Memorandum 98-9, Revision 7, April 2004).

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	Y
Children	III	Y

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel.

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

Failure to thrive (FTT) is a serious growth problem with an often complex etiology. Some of the indicators that a physician might use to diagnose FTT include:

- Weight consistently below the 3rd percentile for age;
- Weight less than 80% of ideal weight for height/age;
- Progressive fall-off in weight to below the 3rd percentile; or
- A decrease in expected rate of growth along the child's previously defined growth curve irrespective of its relationship to the 3rd percentile (1).

FTT may be a mild form of Protein Energy Malnutrition (PEM) that is manifested by a reduction in rate of somatic growth. Regardless of the etiology of FTT, there is inadequate nutrition to support weight gain (2).

Justification for High Risk

Failure to thrive (FTT) is a serious growth problem and, on occasion, can lead to severe forms of protein energy malnutrition (PEM) or micronutrient deficiency diseases. FTT can lead to developmental delays despite weight gain. This growth problem has multiple causation factors which are often unclear, leaving 80% of all cases without an identifiable medical condition. The single characteristic in FTT is under-nutrition or insufficient energy intake. Suitable nutrition counseling and intervention may help prevent some causes of FTT.

In infants younger than 8 weeks, problems with feeding (poor sucking and swallowing) and breastfeeding difficulties are prominent. For older infants, difficulty transitioning to solid foods, insufficient breast milk or formula consumption, excessive juice consumption, and parental avoidance of high calorie foods often lead to FTT. Long-term effects of FTT include delays of physical growth, psychosocial and motor maturation, subsequent cognitive performance, and decreased immune function.

WIC services of supplemental foods and nutrition counseling can directly impact participants with diagnosed FTT. WIC participation can help restore nutrition status, improve weight gain, and promote rehabilitation and growth/catch-up growth by providing key nutrients and nutrition counseling. Additionally, nutritional counseling, as part of a multidisciplinary approach to treatment, has been shown to improve parent-child relationships and cognitive development. The WIC setting can also provide immediate referral for nutrition and health intervention.

Additional Counseling Guidelines

- Discuss caregiver's understanding of FTT diagnosis
- Discuss factors that may be involved in growth failure, such as:
    - inadequate caloric intake
    - mother-infant interaction
        - Tactfully discuss parent/child interaction
        - Does caregiver respond to child's nutritional and emotional needs (educate on cues)
        - Remember, in many FTT cases, caregiver(s) are very tentative and not neglectful
    - Swallowing problems - organic (CNS, cleft palate, etc.)
    - Too sick or too tired to eat (e.g. cardiac conditions, cancer, etc.)
    - Anorexia
    - Spitting-up/vomiting
    - Gastro esophageal reflux (GER)
    - Diarrhea
        - May need to use lactose-free products after GI episodes
    - Malabsorption
    - Illness or disease (gastrointestinal, endocrine, or other chronic disease)

  - Genetic factors
  - Formula intolerances, food preferences
  - Secondary issues (e.g. medications)
  - Unclear origin
- If appropriate, use disease specific growth charts for counseling (e.g. Down's Syndrome)
  - Explain expected and realistic growth pattern - maintaining or gradually increasing channels
  - Explain that frequent weight, height, OFC checks, are important in following growth
- Recommend rate of weight gain per week/month
- Provide basic dietary recommendations for optimal growth
  - Recommend appropriate calorie level

    < 3 mos. 120 kcal/kg
    3-5 mos. 115 kcal/kg
    6-8 mos. 110 kcal/kg
    9-11 mos. 105 kcal/kg
    (possibly based on IBW for catch-up growth)
- If appropriate, explain standard mixing instructions for formula/medical nutritional products prescribed by health care provider (see Product Guide)
  - Refer participant to MD for any special written instructions for mixing
  - Identify if nutritional products are being tolerated or accepted
    - Refer to MD if not
- If appropriate, discuss meal plans to balance use of nutritional products with solid foods
- Discuss meal scheduling
  - May need to add more snacks and meals OR
  - Offer foods only at mealtimes (Eliminate "grazing" to stimulate appetite.)
- Educate on increasing calorie concentration:
  - Give "calorie booster" or "power packing" idea
- Discuss modification of foods
  - May need to change textures, temperature, presentations
- Encourage physical activity if child is medically able
- For breastfeeding infants, discuss:
  - availability of adequate volume of breast milk
  - fatigue at feeds, good latch/suck
  - pumping, SNS use, bottle supplementation
  - number of feeds, length of time between feeds
  - (could use baby weight scales to measure volume intake)
- For premature infants use adjusted gestational age for solid food introduction

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135 Slowed/Faltering Growth Pattern

Definition/Cut-Off Value:

Slowed/Faltering Growth is defined as:

Age	Cut-Off Value
Infants Birth to 2 Weeks	**Excessive weight loss after birth, defined as ≥ 7% birth weight (1, 2).**
Infants 2 weeks to 6 Months of Age	**Any weight loss. Use two separate weight measurements taken at least eight weeks apart (3).**

Participant Category and Priority Level

Category	Priority	High Risk
Infants ≤ 6 Months of Age	I	Y

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned.

Justification

Growth faltering is defined as a growth rate below that which is appropriate for an infant's age and sex. It can affect length, weight, and head circumferences resulting in values lower than expected. Growth faltering may include weight faltering (a drop in weight-for-age) or slowed growth where both weight and length growth are slower than expected. An example of weight faltering is a drop in weight after a minor illness or a measurement/plotting error (4).

Growth in infants is steady and predictable. It is a reflection of health and nutritional status, and the overwhelming majority of infants have no growth problems (5, 6). Normal growth is also pulsatile, with periods of rapid growth or growth spurts followed by periods of slower or no measurable growth (5-8). Catch-up and catch-down growth during early childhood are normal phenomena that affect large numbers of children, particularly during infancy, and may merely be an adjustment to the genetic potential for growth (9). Growth is also seasonal, with length velocities (the change in growth over time) increased

during the spring and summer months and stagnant other months (10). Weight may vary depending on the time of day and infant feeding schedule. Growth may be increased or slowed by a variety of conditions, with changes in growth as the first sign of a pathological condition. Such conditions include: undernutrition, hypothyroidism, iron deficiency, human immunodeficiency virus (HIV), inborn errors of metabolism, lead toxicity, zinc deficiency, immune deficiency, failure of a major organ system such as the gastrointestinal digestive system, renal, cardiovascular, and pulmonary (11). Infants that do not follow a steady predictable pattern, such as those with short stature or decreased growth rate, should be the focus of concern (11).

The timely detection of poor growth in early life is a way to identify infants who may be at risk for growth faltering, and intervene before undernutrition has detrimental health outcomes, such as growth retardation, when incurred early are irreversible (12). It can help prevent short stature and adverse functional and deleterious long term consequences, such as poor cognition and educational performance, low adult wages, lost productivity, and when accompanied by weight gain later in childhood, an increased risk of nutrition-related chronic diseases (13, 14).

Excessive Weight Loss After Birth

Infant weight loss in the early postpartum period is physiologically normal, and nearly universal but the amount of weight loss varies (15). Weight loss of 5% and 7% of birth weight is not unusual for formula-fed or breastfed infants, respectively (16). Healthy infants are expected to regain their birth weight within 8-10 days after birth (17). However, if a breastfed infant loses 7% of birth weight in the first 72 hours after birth, an evaluation and review of the mother-infant dyad is needed and any problems resolved immediately.

Risk of dehydration and failure to thrive in breastfed newborns can be mitigated by early screening and providing lactation support in the early postpartum period (18).

A weight loss of up to 10% of birth weight is the maximum acceptable weight loss for newborn infants, with any additional loss a potential emergency (17, 19). Contributing factors include (2, 16, 17, 20):

- Hospital practices like epidurals, pacifier use, low or non-nutritive feedings, or strict feeding schedules.
- Maternal factors such as retained placenta, parity, anxiety, and poor maternal knowledge.
- Infant factors such as birth weight, gestational age, gender, and feeding method.
- Breastfed infants with poor positioning, latch and/or milk transfer.

WIC staff should identify and address any potential underlying feeding issues causing newborn weight loss (21). An infant with a weight loss of greater or equal to seven percent signals the need for careful evaluation and intervention, infants with a weight loss of ten percent or more is a marker for a medical referral (22).

Any Weight Loss 2 Weeks to 6 Months

While the 2006 CDC/WHO growth charts show slower growth from 3-18 months of age as a normal growth pattern, weight loss is not expected beyond the first two weeks of life and requires follow-up (23).

After birth, growth faltering is caused by inadequate caloric intake, normal caloric intake in an environment of excessive loss or malabsorption; or increased metabolic needs. In cases of dehydration or acute illnesses like gastroenteritis, fluid loss that exceeds fluid intake may also lead to significant weight loss. Weight loss in young infants is commonly caused by acute infections, feeding problems, allergy to milk protein, lead poisoning, HIV, malnutrition, pyloric stenosis, gastrointestinal reflux, celiac disease, cystic fibrosis, neglect, growth failure, congenital heart disease, and inborn errors of metabolism.

The primary goal of the intervention is to enhance infant health outcomes by addressing causes of slowed growth and keeping vulnerable infants tracking along growth percentiles established in infancy. In some cases, it may be important to intervene quickly, while in other cases a period of frequent growth monitoring would be more appropriate to prevent too rapid refeeding and subsequent increased risk of type 2 diabetes, obesity, and cardiovascular disease later in life (24, 25).

If faltering growth is suspected, maternal neglect and inadequate caloric intake due to inappropriate formula mixing, breastfeeding problems, early introduction of solid food, maternal depression, and emotional deprivation, must be ruled out and addressed (6). Growth monitoring should occur on a monthly basis – utilizing two separate weight measurements taken at least eight weeks apart as data markers. It is imperative that WIC staff involved in measuring infant growth use standardized equipment and receive adequate training prior to conducting infant measurements to increase reliability between measures (26).

If the participant does not respond to nutritional management (i.e. weight continues to falter) or if other markers falter (such as length for age or stagnant head circumference), then the infant should be referred to their health care provider for assessment.

Normal Growth Patterns

Understanding normal growth patterns in infants is important. The pattern of weight gain during infancy varies depending on the method of feeding. Compared to formula-fed infants, breastfed infants gain weight rapidly in the first three to four months of life and relatively slowly thereafter. Although the weights of formula-fed and breastfed infants are similar by one to two years of age, the typical pattern of slowed weight gain after three to four months among breastfed infants may lead to unnecessary early introduction of solid foods or cessation of breastfeeding if the slowed weight gain is perceived as lactational inadequacy. (27, 28, 29)

The table below shows the average mean values for weight gain for healthy exclusively breastfed infants:

Average Of Mean Values for Gains in Weight for Healthy Exclusively Breastfed Infants (30)

Interval (mo)	Girls (g/day)	Boys (g/day)
0-1	30	**33**
1-2	28	**34**
2-3	22	**23**
3-4	19	**20**
4-5	15	**16**
5-6	13	**14**
6-7	**12**	**11**

Screening for Slow or Faltering Growth Patterns

Screening for slow or faltering growth patterns is a preventive health measure which requires careful growth monitoring and critical thinking skills. And while a single measure of weight-for-age may be cause for concern, it cannot be interpreted to show growth faltering. No single measurement on its own is adequate for identifying nutritional growth delay (31). As stated earlier, it is imperative that WIC staff involved in measuring infant growth use standardized equipment and receive adequate training prior to conducting infant measurements to increase reliability between measures (26).

Growth faltering is a reflection of two weight measures, preferably eight weeks (two months) apart, to calculate an increment in growth. It is possible to use four week (one month) intervals for the assessment of slow growth patterns, but since there may be errors in clinical measurement, it is more prudent to use eight weeks as the minimum time interval between measurements. Infant weight will fluctuate over the course of the day, and length growth may occur in discrete periods lasting no more than 24 hours separated by growth-free intervals lasting as long as two months. Thus, growth that seems abnormal may be nothing more than a growth-free period in a child's life (10).

Screening for early growth failure should be done using multiple growth indicators, including risks for underweight (Risk #103), short stature (Risk #121), failure to thrive (Risk #134) and low head circumference (Risk #152) to allow for timely remedial interventions and prevention of further growth failure.

In summary, a three-step approach should be considered for evaluation of infants with suspected abnormal growth. First, growth data should be assessed for accuracy. Second, feeding problems, improper formula preparation, etc. should be assessed to determine if calorie intake is insufficient for growth and development. Third, the infant should be assessed for other medical conditions or developmental delays.

Implications for WIC Services

In most situations, growth may not simply be a factor of undernutrition, but rather a combination of environmental and other factors which will require a broad intervention strategy for successful health outcomes (32). In general, intervention strategies may include screening for environmental health factors such as (25, 32):

- Adequate nutrition and nutrient dense foods, including a history of human milk or formula feeding.
- Appropriate introduction of complementary foods.
- Maternal conditions that impact lactation performance: mastitis, prolonged labor, C-Section, hypo or hyperthyroidism, Diabetes, low birth weight infant, pregravida BMI >27, pregnancy-induced hypertension, flat/inverted nipples, vitamin B12 deficiency.
- Mealtime routine and eating/feeding behavior.
- Growth faltering in light of familial growth patterns.
- Neglect.
- Lack of social support.
- Adverse social and psychological environment.
- Depressed or poor mental abilities of parent/caregiver. It may manifest as dressing inappropriately for the weather; looking disheveled and lacking in hygiene; or making inappropriate faces or reactions like laughing.
- Lack of parental education and nutrition knowledge.

Nutrition counseling for this risk would ideally be provided by staff with specialized education and training to assess growth parameters and identify causative factors accurately. Intervention strategies to address this criterion include:

- Appropriate timing and type of participant intervention.
- Effective participant-centered nutrition counseling.
- Early postpartum breastfeeding support to minimize risk of dehydration and/or failure to thrive.
- Review of baby behavior hunger and satiety cues. (For more information see WIC Baby Behavior Basics, WIC Online Learning Module available on the WIC Works Resource System: https://wicworks.fns.usda.gov/wic-learning-online.)
- Review/adjustment to breastfeeding/formula feeding schedule.
- Review/adjustment of formula mixing technique.
- Referral to lactation specialist for latch and position assistance.
- Tailored food package prescription.

- Review accuracy of weight, length, and head circumference measurements.
- Referral to allied health professionals such as the physician, early childhood intervention, social services, and home visiting program.

A variety of intervention strategies can help infants establish and maintain individual growth patterns. The desired outcome is one where the infant's own growth curve tracks within the channel established in early infancy. Also, because growth monitoring is an intervention that happens largely after the fact, there may be benefit to anticipatory guidance that provides prevention rather than crisis management of this problem (33). It is suggested that when feeding is going well, the baby will eat as much as she needs and grow in the way that is right for her if parents maintain a division of responsibility in feeding (34).

Justification for High Risk

Inappropriately low weight for stature provides a clear indication of recent malnutrition. The WIC environment provides for an excellent opportunity to identify a decline in growth through anthropometric monitoring and prevent deterioration through ongoing nutrition education and supplemental foods. Such intervention promotes catch-up growth in weight and other dimensions of growth. The participant can also benefit from additional nutritional and medical referrals.

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141 Low Birth Weight and Very Low Birth Weight

Definition/ Cut-Off Value

Low Birth Weight (LBW)

- Birth weight defined as ≤2500g (<5 pounds 8 ounces*) for infants and children less than 24 months old

Very Low Birth Weight (VLBW)

- Birth weight defined as ≤1500g (<3 pounds 5 ounces*) for infants and children less than 24 months old

*Metric weight converted to pound and ounces for WIC clinic use.

Note: See Clarification section for information on plotting growth measurements for preterm infants Risk 142 Preterm or Early Term Delivery.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	Y
Children (< 24 months old)	III	N

Parameters for Auto Assignment
Low Birth Weight (LBW)

- Auto assigned for infants and children < 24 months if birth weight was ≤ 5.5 lbs and > 3.3 pounds

Very Low Birth Weight (VLBW)

- Auto assigned for infants and children < 24 months if birth weight was ≤ 3.3 pounds

High Risk Flag

High risk designation will automatically activate when this risk factor is assigned for infants

Justification

Low birth weight (LBW) has been defined by the World Health Organization (WHO) as weight at birth of less than 2500 grams (5 pounds 8 ounces) regardless of gestational age (1, 2, 3, 4). This is based on epidemiological observations that infants weighing less than 2500 grams are at higher risk of neonatal mortality when compared with heavier infants (5, 6). LBW is further categorized into very low birth weight (VLBW, <1500 gm or 3.3 pounds) and extremely low birth weight (ELBW, <1000 gm or 2.2 pounds) (1). LBW is considered the single most important predictor of infant mortality, especially within the first months of life (6). Neonates with LBW have a 20 times greater risk of dying compared to infants of normal birth weight (3, 5). LBW contributes to a range of poor health outcomes including fetal and neonatal mortality and morbidity, and inhibited growth (1, 3, 4).

LBW is usually caused by intrauterine growth restriction (IUGR), preterm birth (PTB) or both (3, 4, 6). Preterm birth (an infant born at fewer than 37 weeks' gestational age) is the most common cause of LBW (1). In the U.S., the rates of preterm births have increased from 10% to 12.5% in the past 25 years likely as a result of higher survival rates due to advances in perinatal medical care (4). LBW is more common in developing than developed countries. However, data on LBW in developing countries is often limited because a significant portion of births occur in homes or small health facilities, where cases of infants with LBW often go unreported leading to an underestimation of the prevalence of LBW (2). It is estimated that 20% of all births worldwide are LBW, representing more than 20 million births a year (7). In the U.S., approximately 1 in 12 infants (8%) is born with LBW (8, 9). The percentage of LBW infants has increased 4% among all racial groups from 2016-2021 in the U.S. (8). Since 2016, LBW rates increased a total of 1% for non-Hispanic White women, 7% for non-Hispanic Black women and 7.3% for Hispanic women (8). The rates of LBW among different racial and ethnic groups in the U.S. are (9):

- 1 in 7 Black infants (14%)
- 1 in 12 Asian infants (8%)
- 1 in 13 Native American or Alaska Native infants (8%)
- 1 in 14 Latinx infants (7%)
- 1 in 14 White infants (7%)

Black infants are more than twice as likely to be born with a LBW or to die in their first year of life as White infants (9). Rates of very low birthweight (VLBW) infants comprise only 1.0% of live births in the U.S. but Black mothers are 2.6 times more likely to have a VLBW infant than White mothers (10, 11). The increased likelihood of LBW in Black infants has been associated with mothers who are unmarried, unemployed, lower income, younger, and receive federal government assistance to pay for rent (10, 12, 13, 14, 15, 16). Yet even with the presence of traditional protective factors such as marriage, education, and being non-smokers, Black women still experience LBW at higher rates than Whites (12, 14, 15, 16). Institutional racism (differences in access to resources by race as well as differences in policies, laws and practices that reinforce racial inequity) may explain racial disparities in LBW between Black and White women (12, 14, 15, 16). Black women are at a higher risk of chronic stress due to adverse social determinants including low socioeconomic status, housing insecurity, and experience racism as a stressor and weathering (discrimination that worsens with age) (12, 14, 15, 16). Black mothers, when compared to other racial or ethnic groups, have the highest rate of LBW babies despite whether they were born in the U.S. or in another country (12, 17, 18). However, multiple studies have shown Black infants born to mothers who are immigrants experience LBW at rates similar to infants born to White mothers, suggesting the presence of other factors affecting birth weight for non-immigrant Black mothers (12, 17, 18). U.S. born Black women have more exposure to racism as a major stressor that negatively impacts maternal health while foreign born Black women do not report perceiving racism in the same way (12, 17). In addition, foreign-born Black women may have more positive social determinants such as higher levels of education and income, and access to better health care (12, 17, 18). This issue is very complex, and continued research is needed focusing on the factors contributing to the inequitable racial gap in LBW.

LBW infants are more likely than infants whose weight is normal to have medical problems that may include (1, 3, 4, 9):

- **Respiratory:** Respiratory Distress Syndrome (RDS). Infants with RDS do not have a protein called surfactant that keeps small air sacs in an infant's lungs from collapsing. Treatment with surfactant helps these infants breathe more easily. Infants who have RDS also may need oxygen and other medical support to help their lungs work.
- **Neurological:** Intraventricular Hemorrhage (IVH). Bleeding in the brain.
- **Cardiovascular:** Patent ductus arteriosus. Patent ductus arteriosus is when an opening between 2 major blood vessels leading from the heart does not close properly. This can cause extra blood to flow to the lungs. In many infants who have patent ductus arteriosus, the opening closes on its own within a few days after birth. Some infants need medicine or a surgery to close the opening.
- **Gastrointestinal:** Necrotizing enterocolitis (NEC) is a gastrointestinal disease that involves infection and inflammation that causes damage and the death of cells in some or all the intestines.
- **Jaundice:** An excess of bilirubin due to the infant's liver not adequately removing it from the bloodstream.
- **Retinopathy of prematurity:** When an infant's retinas do not fully develop in the weeks after birth.
- **Immunological:** Sepsis, pneumonia, or meningitis**.** In an infant who is born prematurely, the immune system may not be fully developed and may not be able to fight off infection.

When LBW infants become children, they tend to have lower neurodevelopmental scores in the areas of language, cognition, and motor skills compared to term normal birth weight infants (19). There is also evidence that LBW infants have a higher risk of developing chronic health conditions later in life including (4, 9):

- Diabetes
- Heart disease
- High blood pressure
- Metabolic syndrome
- Obesity
- Stroke

Nutrition for Infants with LBW and VLBW

The LBW or VLBW infant may begin life with a compromised nutritional status and require a form of nutrition support (human milk fortifier, special infant formula, tube feeding) (1). Some of these infants, especially ones with VLBW, will need supplemental feedings because they have limited nutrient reserves at birth and are subject to physiological and metabolic stresses that increase their nutrient needs (1, 20). Providing breast milk to these infants in the first month of life has been linked to improved growth and development (1). While infant formula can be used to offer higher amounts of macronutrients than breast milk, it can be harder to digest for LBW and VLBW infants (21). Breast milk contains beneficial biological components, including immunoglobulins, cytokines, growth factors, hormones, antimicrobial agents, immune cells, stem cells, prebiotic oligosaccharides, and probiotic bacteria (1). Mother's own milk has been associated with multiple health benefits for LBW and VLBW infants, including lower incidences of necrotizing enterocolitis (NEC), late-onset sepsis, chronic lung disease, retinopathy of prematurity, and neurodevelopmental impairment (20, 21, 22, 23). Pasteurized donor breast milk is recommended when mother's own milk is not available or sufficient (23). LBW infants that are supplemented with fortified pasteurized donor milk have a greater risk of growth failure than those fed mother's own milk (23).

For VLBW infants, breast milk often requires fortification with human milk fortifiers in order to meet their nutritional needs (23). Assistance in early milk expression should be available to mothers within 6 to 8 hours of birth of any VLBW infant because of the need for early and frequent milk expression to maintain milk supply (23). The use of breast milk is lower among VLBW infants with non-Hispanic Black mothers, compared with those with non-Hispanic White mothers. Approaches that have been shown to reduce Black and White disparities in breastfeeding in the NICU setting, include peer counselor programs and support groups, assistance with breast pump acquisition, and transportation for mothers to visit the hospital (23).

Implication for WIC Nutrition Services

WIC services can directly support LBW and VLBW infants and their caregivers, as they may have unique feeding difficulties. LBW and VLBW infants may be born preterm so their delivery is often unexpected, and a mother may not have made decisions about how to feed her infant yet. These infants may require additional calories, extra breastfeeding support, and/or the use of a human milk fortifier or special infant formula. WIC can support LBW and VLBW infants and their caregivers through:

- Providing breastfeeding education to mothers. This has been shown to increase breastfeeding intent and decrease maternal anxiety. Education may include information on the health benefits of mother's own milk, the need for early and frequent milk expression, the role of skin-to-skin contact, nonnutritive suckling, direct breastfeeding when physiologically appropriate, and technical information on proper milk handling, storage, and transport (23).
- Referring to a WIC breastfeeding peer counseling program, if available.
- Promoting and supporting breastfeeding as the normative standard for infant nutrition and providing early and frequent breastfeeding support.
- Recommending the use of a hospital grade electric breast pump for expressing milk if the infant is in the NICU or the infant is unable to breastfeed directly from the breast.
- Providing anticipatory guidance about potential feeding challenges.
- Monitoring the child's growth to ensure healthy weight gain.
- Providing nutrition education for mothers/caregivers and appropriate referrals as necessary for growth, feeding, health, and/or infant developmental issues.
- Discouraging families from direct milk sharing and the purchase of breast milk from Internet-based sources as both practices are associated with risks of bacterial or viral contamination of non-pasteurized milk and the possibility of exposure to medications, other substances, and unsafe handling practices (23).

Justification for High Risk

Low birth weight is associated with poor health, growth and development. It is the most important biological predictor of infant death and deficiencies in physical and mental development. The consequences of low birth weight caused by intrauterine growth restriction (IUGR) and those caused by prematurity differ, however when combined with low birth weight they pose an increased risk. Infants with extreme low birth weight are at a very high risk for long term neurobehavioral dysfunction and poor school performance. Infants must receive an optimal nutrient intake to survive, meet the needs for an extended period of rapid postnatal growth, and complete their growth and development.

Low birth weight increases the probability of mortality and morbidity in infants and can lead to both short and long-term health risks. The chance of health problems increases with lower birth weights. Potential gastrointestinal and/or nutritional risks of low birth weight infants include hyperbilirubinemia, feeding intolerance, growth failure, failure to thrive, short-bowel syndrome, and cholestasis.

One of the major complications in low birth weight infants is necrotizing entercolitis (NEC). Providing low birth weight infants with breast milk reduces the risk of NEC as well as many other diseases and complications. However, the barriers and obstacles mothers face in initiating and establishing a good milk supply for their hospitalized low birth infants often leads to a decreased breast milk production. Consequently, the infant may not receive an adequate amount of breast milk.

There is also controversy whether catch up growth is beneficial or harmful to infants. More and more research states that catch up growth may play a significant role in developing type 2 diabetes, cardiovascular disease, or metabolic syndrome later in life. However, inadequate growth in the early years can also lead to lower cognitive development over time. Thus, it is important to track growth and adjust nutrition care to help low birth weight infants achieve optimal growth while avoiding excessive weight gain. WIC can help monitor growth and educate on proper nutrition care, the importance of breastfeeding, and provide support to breastfeeding mothers.

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142 Preterm or Early Term Delivery

Definition/Cut-off Value--142a and 142b

Preterm and early term delivery are defined as follows (1, 2):

- Preterm: Delivery of an infant born ≤36 6/7 weeks gestation—**142a**
- Early Term: Delivery of an infant born ≥37 0/7 and ≤38 6/7 weeks gestation—**142b**

Note: See Clarification section for information on plotting growth measurements for preterm infants.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	142a
Children (< 24 months old)	III	N

Justification

Preterm birth is a significant cause of newborn morbidity and mortality. Preterm and early term deliveries strain society's healthcare resources due to the longer hospital stays for the infant and the long-term effects on the health of the newborn (3, 4).

Typically, a pregnancy lasts about 40 weeks. Premature or preterm birth, however, is defined as a birth that occurs between 20 and 37 weeks of pregnancy, according to the American College of Obstetricians and Gynecologists (ACOG) (5). In the past, the period from 3 weeks before until 2 weeks after the estimated date of delivery was considered a "term" pregnancy, with the expectation that a baby would have similar health outcomes if they were born any time during this interval. In 2013, ACOG released a committee opinion that the label "term" should be replaced with the designations *early term* (≥37 0/7 weeks and ≤38 6/7 weeks gestation) and *full term* (≥39 0/7 weeks and ≤40 6/7 weeks gestation) to more accurately describe these groups of infants (1).

Preterm Delivery

Prematurity affects about 12% of all live births in the U.S., and about 50% of these preterm births were preceded by preterm labor (6). In 2011, the annual rate of premature births in the United States reached 11.7%, nearly two times the rate in European nations (6). Preterm births also account for approximately 70% of newborn deaths and 36% of infant deaths (5).

Several factors have been found to increase the risk of preterm delivery. Epidemiological studies have consistently reported low socioeconomic status, nonwhite race, maternal age of ≤18 years or ≥40 years, and low pre-pregnancy weight as risk factors. A history of one previous preterm birth is associated with a recurrent risk of 17-37%; the risk increases with the number of prior preterm

births and decreases with the number of term deliveries. Other maternal factors associated with a risk of preterm birth may include low weight gain during pregnancy, maternal obesity, hypertension, diabetes, or sexually transmitted diseases (7). (See risk 311 *History of Preterm or Early Term Delivery* for more details.)

Despite advances in neonatal care, preterm birth remains a leading cause of infant death in the United States (8). Preterm infants may have health problems because their organs did not have enough time to develop in the womb. Babies that are born too early may have a number of health conditions, including:

- Low or very low birth weight (9)
- Increased caloric needs (9)
- Feeding difficulties due to a lack of reflexes for sucking and swallowing (9)
- Immature digestion and impaired absorption of carbohydrates and lipids (10, 11)
- Breathing problems like chronic lung disease/ bronchopulmonary dysplasia and apnea (9, 12, 13)
- Cerebral palsy, an impairment of the brain that controls movement and muscle tone (10, 14)
- Developmental delay and poorer cognitive function(12, 15, 16, 17)
- Vision problems like retinopathy of prematurity (ROP), which may cause blindness (12, 15)
- Hearing problems (12)
- Behavioral problems and psychiatric disorders (16, 17)
- Increased risk for necrotizing enterocolitis (NEC) due to their immature gastrointestinal systems (10, 12)
- Increased risk for Sudden Infant Death Syndrome (SIDS) (10)
- Temperature control problems (9, 10)
- Heart problems like patent ductus arteriosus and low blood pressure (hypotension) (10, 12)
- Blood problems like anemia and jaundice (10, 13)
- Hypoglycemia (9, 10)
- Immature immune systems, which may result in infections (9)

Preterm infants often need special medical care in a neonatal intensive care unit (NICU) and may need to stay there for days or even months. Breastfeeding is recommended as the normative standard for infant feeding and nutrition for all infants, especially preterm babies. Breastfeeding preterm infants has been associated with positive health outcomes for these infants, including:

- Improved motor maturity and cognitive ability (18, 19, 20)
- Reduced risk of NEC (21, 22)
- Reduced risk of ROP and retinal detachment (23)

Additionally, mothers of preterm infants produce milk that is designed to meet the baby's particular nutritional needs during the first few weeks of life. It is higher in protein and minerals, such as salt, and contains different types of fat that are easier to digest and absorb compared to fats in the milk of mothers of full term babies. The fat in human milk also helps to enhance the development of the baby's brain and neurologic tissues, which is especially important for premature infants. Human milk is also easier for babies to digest than infant formula and avoids exposing the baby's immature intestinal lining to the cow's milk proteins found in premature infant formula. Preterm infants who are breastfed are less likely to develop intestinal infections than babies who are

formula fed, and the colostrum produced in the first few days contains high concentrations of antibodies that will help the baby fight infection (22).

Breastfeeding preterm infants, especially if they are in the NICU, may present unique challenges for breastfeeding dyads. These mothers will benefit from extra breastfeeding support due to the delay of direct breastfeeding, reliance on breast pumps, and the stress of having a sick newborn. Even if the baby cannot breastfeed directly from the breast at first, the mother can be encouraged to express her milk to ensure that her supply is maintained. Supportive care for infants in the NICU may include the use of a feeding tube. Expressed human milk can be passed through the tube, therefore, it is important for the mother to discuss her feeding decisions with her baby's doctor. Preterm infants sometimes need additional calories and nutrients to facilitate adequate growth, and in such cases a human milk fortifier may be prescribed by a health care provider (22).

Preterm infants who are not breastfed may require the use of a formula higher in calories and nutrients to support their growth. According to the American Academy of Pediatrics (AAP), soy formulas are typically not recommended for low birth weight preterm infants, as their use may result in less weight gain and lower serum albumin and phosphorus levels than cow's milk-based formulas (24).

In addition to breastfeeding, skin-to-skin care or kangaroo care (holding your baby naked or in just a diaper on your bare chest), can help preterm infants breathe better, gain weight, keep their body at the right temperature, and prepare them for breastfeeding (25). All caregivers can provide skin-to-skin care, not just the mother.

Infants born at 34 0/7 through 36 6/7 weeks gestation, called late preterm infants, are sometimes mistaken for term infants since their size and weight may be similar (10). However, caregivers, healthcare providers, nutritionists, and lactation consultants must be aware that these babies are physiologically and metabolically immature (9). In addition to the health conditions previously mentioned for preterm infants, it is important to be aware that late preterm babies have an increased risk of morbidity and mortality which is often related to feeding problems. Due to their immaturity, late preterm infants may have more challenges with breastfeeding because they tire easily and have less stamina, which results in greater difficulty with latching, sucking, and swallowing. Mothers of late preterm infants will benefit greatly from timely lactation assessment and support since feeding difficulties, slow weight gain, failure to thrive, hypoglycemia, and jaundice are very common in these babies (26).

Preterm infants have different patterns of growth compared to term infants. Plotting the growth of preterm infants using their adjusted gestational age is an essential component of care until they reach 24 to 36 months of age (27). (See the *Clarification* section for more information on how to determine adjusted gestational age.) Most preterm infants, however, show catch-up growth in weight, length, and head circumference after their initial postnatal growth failure. If catch-up growth occurs, it usually starts early in the first months of life and is often achieved within the first years of life (28).

The effects of preterm birth can continue beyond infancy. Children who were born prematurely are at an increased risk for the following:

- Neurodevelopmental problems (29)
- Intellectual/cognitive impairments, which can lead to learning disabilities and the need for special education services (29, 30, 31)
- Motor problems (31)
- Feeding difficulties such as problems with chewing and swallowing, late development of feeding skills, food refusal, eating behavior problems, and poor appetite (32)
- Emotional problems such as anxiety and depression (31)
- Behavioral concerns such as attention problems and hyperactivity (31)

Early Term Delivery

Up to 10% of babies in the United States are scheduled for early term deliveries via labor-inducing medication or cesarean section before 39 weeks of gestation despite neither the mother nor the baby being at risk if the pregnancy continues (4). Elective deliveries like this are sometimes requested for reasons such as wanting to schedule the date of the infant's birth, physician preference, or for relief of symptoms at the end of the pregnancy (4).

Research shows that a fetus will experience a significant amount of development and growth of the lungs, brain, and liver between 37 and 39 weeks of gestation. The brain develops at its fastest rate at the end of the pregnancy, at a rate of up to one third between weeks 35 and 39. Additionally, layers of fat are added under the infant's skin during the last few weeks of pregnancy which helps them keep warm after birth. According to ACOG, non-medically warranted deliveries prior to 39 weeks should be avoided (33). Early term delivery puts an additional strain on society as the early term infant will likely require a longer hospital stay and may have long term healthcare needs (4).

Implications for WIC Nutrition Services

WIC services can directly support preterm and early term infants and their caregivers, as these babies may have unique feeding difficulties. Preterm delivery is often unexpected and a mother may not have made decisions about how to feed her baby yet. These infants may require additional calories, extra breastfeeding support, and/or the use of a human milk fortifier or special infant formula.

WIC can support preterm and early term infants and their caregivers through:

- Promoting and supporting breastfeeding as the normative standard for infant nutrition and providing early and frequent breastfeeding support.
- Recommending the use of a hospital grade electric breast pump for expressing milk if the baby is in the NICU or the baby is unable to breastfeed directly from the breast.
- Providing anticipatory guidance about potential feeding challenges.
- Encouraging caregivers to provide skin-to-skin contact.
- Providing education on safe preparation, handling, and storage of breast milk and/or formula.
- Educating pregnant women about the importance of carrying a baby to term, unless

medically contraindicated.
- Monitoring the child's growth to ensure healthy weight gain.
- Providing nutrition education for mothers/caregivers and appropriate referrals as necessary for growth, feeding, health, and/or infant developmental issues.

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Clarification

All preterm infants and children (up to 2 years of age) who have reached the equivalent age of 40 weeks gestation, shall be assessed for growth using the Centers for Disease Control and Prevention (CDC) Birth to 24 Months gender specific growth charts adjusting for gestational age as follows:

1. Document the infant/child's gestational age (at delivery) in weeks. (Mother/caregiver can self- report, or referral information from the medical provider may be used.)
2. Subtract the child's gestational age in weeks from 40 weeks (gestational age of term infant) to determine the adjustment for prematurity in weeks.
3. Subtract the adjustment for prematurity in weeks from the child's chronological postnatal age in weeks to determine the child's gestation-adjusted age.

Example:

Randy was born prematurely on March 19, 2011. His gestational age at birth was determined to be 30 weeks based on ultrasonographic examination. At the time of the June 11, 2011, clinic visit, his chronological postnatal age is 12 weeks. What is his gestation-adjusted age?

- 30 = gestational age in weeks
- 40 - 30 = 10 weeks adjustment for prematurity
- 12 - 10 = 2 weeks gestation-adjusted age

His measurements would be plotted on a growth chart as a 2-week-old infant.

Note: Preterm infants (≤ 36 6/7 weeks gestation) who have not reached the equivalent age of 40 weeks gestation **may** be assessed for growth using a growth chart for low birth weight (LBW) or very low birth weight (VLBW) infants (e.g., Infant Health and Development Program [IHDP]) consistent with the protocols of the local medical community in which the WIC clinic operates. The CDC does **not** recommend the use of the CDC Growth Charts for preterm infants who have not reached the equivalent age of 40 weeks gestation.

151 Small for Gestational Age

Definition/ Cut-Off Value

For infants and children < 24 months old:

Presence of small for gestational age diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Note: See “Guidelines for Growth Charts and Gestational Age Adjustment for Low Birth Weight and Very Low Birth Weight Infants” (FNS Policy Memorandum 98-9, Revision 7, April 2004) for more discussion on the anthropometric assessment and nutritional care of SGA infants.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	Y
Children (< 24 months old)	III	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel.

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned for infants.

Justification

Impairment of fetal growth can have adverse effects on the nutrition and health of children during infancy and childhood, including higher mortality and morbidity, slower physical growth, and possibly slower mental development. Infants who are small for gestational age (SGA) are also more likely to have congenital abnormalities. Severely growth-retarded infants are at markedly increased risk for fetal and neonatal death, hypoglycemia, hypocalcemia, polycythemia, and neurocognitive complications of pre- and intrapartum hypoxia. Over the long term, growth-retarded infants may have permanent mild deficits in growth and neurocognitive development (1).

WIC staff should routinely complete anthropometric assessments and follow-up (to include coordination with and referral to, other health care providers and services) for infants/children with a diagnosis/history of SGA who have not yet demonstrated normal growth patterns.

Justification for High Risk

Infants born small for gestational age (SGA) have a greater risk for developing health problems later in life such as cardiovascular disease and metabolic syndrome. While the association's cause is unknown, there are two strong hypotheses. The thrifty gene hypothesis explains that a nutritionally deprived fetus will divert nutrients to the brain at the expense of body growth and pancreas, liver and muscle development. Research investigating the relationship between insulin sensitivity and premature or term SGA infants shows that by age one-year, insulin sensitivity is reduced and they may become insulin resistant. This association was more evident in those who had a rapid weight gain after birth.

The second hypothesis explaining disease occurrence later in life for infants born SGA is the catch-up growth hypothesis. Catch-up growth is a common method of treatment for SGA infants aimed at achieving adequate growth in height and weight as well as fat mass. However, research has found that quickly increasing weight gain early in life for a low birth weight infant is associated with increased risk of obesity, insulin resistance, type-2 diabetes and CVD. In relation to this finding, consumption of a nutrient-enriched formula was associated with increased blood pressure in SGA infants, affecting them up to 8 years later. As adults, SGA infants have a greater percentage of body fat than infants born appropriate for gestational age and are more likely to have a higher abdominal fat distribution, which are risk factors for CVD, type-2 diabetes and metabolic syndrome. The exact timing of rapid weight gain which contributes to the poor health outcomes is still being debated. WIC provides growth assessment as well as breastfeeding and nutrition counseling that can benefit children who were born SGA.

Additional Counseling Guidelines

- Explain potential risks of SGA:
  - Higher mortality and morbidity rates
  - Slower physical growth
  - Possibly slower mental development
  - Congenital abnormalities
  - Long term deficit growth and neurocognitive development
- If premature, HMF, or supplements of premature formula are recommended with the continuation of long term breastfeeding
- If breastfeeding is not possible or feasible, work with medical provider to provide formula tailored to meet infant's needs
- Explain appropriate calorie level and nutrient intake to encourage appropriate growth
- Delay solids until the infant is developmentally ready

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152 Low Head Circumference (Infants and Children < 24 Months of Age)

Definition/ Cut-Off Value

Low head circumference for infants and children < 24 months of age is defined as follows:

Birth to < 24 months having ≤ 2.3rd percentile head circumference-for-age as plotted on the Centers for Disease Control and Prevention (CDC) Birth to 24 months gender specific growth charts (1) (available at: www.cdc.gov/growthcharts).*

** Based on 2006 World Health Organization international growth standards (2). CDC labels the 2.3rd percentile as the 2nd percentile on the Birth to 24 months gender specific growth charts. For more information about the percentile cut-off, please see Clarification.*

Note: For premature infants and children (with a history of prematurity) up to 2 years of age, assignment of this risk criterion will be based on adjusted gestational age. For information about adjusting for gestational age see: Guidelines for Growth Charts and Gestational Age Adjustment for Low Birth Weight and Very Low Birth Weight Infants.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	N
Children	III	N

Parameters for Auto Assignment

Auto assigned for infants if head circumference is ≤ 2.3rd percentile (assignment based on adjusted gestational age if applicable).

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel for children.

Justification

The American Academy of Pediatrics recommends that all children have a head-circumference measurement at each well-child visit until 2 years of age (3). It is recommended that the measurements be plotted on gender specific growth charts to identify children with a head size or growth pattern that warrants further evaluation (3). Low head circumference (LHC) is associated

with pre-term birth and very low birth weight (VLBW) as well as a variety of genetic, nutrition, and health factors (4). Head size is also related to socioeconomic status and the relationship is mediated in part by nutrition factors (4). LHC is indicative of future nutrition and health risk, particularly poor neurocognitive abilities (4). LHC among VLBW children is associated with lower IQ and poorer academic achievement (5). Some studies suggest that interventions to improve antenatal and postnatal head circumference growth may contribute to better scholastic outcomes (5).

Implications for WIC Nutrition Services

LHC alone does not necessarily indicate an abnormal head size. The diagnosis of LHC must also be based on the presence of other evidence and knowledge of the causes of LHC (5). Although WIC agencies may choose not to take head circumference measurements, referral data that indicates LHC may be used to assign this risk.

Through client-centered counseling, WIC staff can assist families in making nutritionally balanced food choices to promote adequate growth. Also, the foods provided by the WIC Program are scientifically-based and intended to address the supplemental nutritional needs of the Program's target population, and can be tailored to meet the needs of individual participants.

In addition, WIC staff can greatly assist families by providing referrals to medical providers and other services, if available, in their community. Such resources may provide the recommended medical assessments, in order to rule out or confirm medical conditions, and offer treatment when necessary and/or in cases where growth improvement is slow to respond to dietary interventions.

Clarification

The cut-off for LHC is 2.3; however, for ease of use, CDC labels it as the 2nd percentile on the hard copy Birth to 24 months growth charts. Electronic charts should use the 2.3rd percentile as the cut-off.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Explore potential causes of low head circumference, such as:
    - Malnutrition during critical stages of brain development (from early fetal life through approximately 3 months past delivery). Mother's pre-pregnancy weight, fat stores, and weight gain during pregnancy are correlated with head size.
    - Genetic disorders such as autosomal and sex chromosome abnormalities

    - Health factors including: PKU, exposure to neurotoxic substances, cocaine and alcohol use during pregnancy, intracranial hemorrhages, perinatal asphyxia, ischemic brain injury, and other major congenital CNS abnormalities
- Explain risks associated with low OFC:
    - Poor neurocognitive abilities
    - Lower IQ
    - Growth or developmental retardation
    - Increased morbidity
- Poor nutrition affects weight first, then height, then head circumference; thus a small head circumference may indicate advanced malnutrition
- Preterm, black, and Asian children may be smaller, but should not fall < 10th percentile

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153 Large for Gestational Age

Definition/ Cut-Off Value

Birth weight ≥ 9 pounds (≥ 4000 g); or presence of large for gestational age diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	N

Parameters for Manual Assignment

Must be manually selected by designating LGA on the birth measurement Anthropometric record.

Justification

Infant mortality rates are higher among full-term infants who weigh > 4,000 g (> 9 lbs) than for infants weighing between 3,000 and 4,000 g (6.6 and 8.8 lbs). Oversized infants are usually born at term; however, preterm infants with weights high for gestational age also have significantly higher mortality rates than infants with comparable weights born at term. When large for gestational age occurs with pre-term birth, the mortality risk is higher than when either condition exists alone (1). Very large infants regardless of their gestational age, have a higher incidence of birth injuries and congenital anomalies (especially congenital heart disease) and developmental and intellectual retardation (2).

Large for Gestational Age may be a result of maternal diabetes (which may or may not have been diagnosed before or during pregnancy) and may result in obesity in childhood that may extend into adult life (1).

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Explain potential risks of LGA, such as:
  - Childhood/adult obesity
  - Developmental or intellectual retardation
  - If also premature, higher mortality and morbidity rates

References

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201 Low Hematocrit/Low Hemoglobin

Definition/Cut-off Value

Low Hemoglobin (Hb) or hematocrit (Hct) is defined as less than the 5th percentile of the distribution of Hb concentration or Hct in a healthy reference population based on age, sex, and stage of pregnancy (1).

Cut-off values are provided in the attached Tables 201-A and 201-B, based on the levels established by the Centers for Disease Control and Prevention (CDC). Adjustments for smoking and/or altitude are optional for State agencies. In addition, Table 201-C includes a table of rounded hematocrit values adapted from CDC for those WIC agencies that obtain hematocrits only in whole numeric values.

Participant Category and Priority Level

Participant Category and Priority Level		
Category	**Priority**	**High Risk**
Pregnant	I	Hematocrit >3%ile OR Hemoglobin > 1 g/dl below cut-off
Breastfeeding	I	Hematocrit >3%ile OR Hemoglobin > 1 g/dl below cut-off
Postpartum	III, IV, V, or VI	Hematocrit >3%ile OR Hemoglobin > 1 g/dl below cut-off
Infant	I	Hematocrit >3%ile OR Hemoglobin > 1 g/dl below cut-off
Children	III	Hematocrit >3%ile OR Hemoglobin > 1 g/dl below cut-off

Justification

Hemoglobin (Hb) is the iron-containing, oxygen-carrying protein in blood. Hematocrit (Hct) is the percentage of blood that consists of packed red blood cells. Hb and Hct tests are used as an initial screen for anemia (2). There are many types of anemia, determining the specific type and cause of an individual's anemia requires additional evaluation by a health care provider. Iron deficiency anemia (IDA), caused by inadequate iron, is the most common type of anemia (2). Megaloblastic anemia is a group of anemias usually caused by deficiency of folic acid or vitamin B-12 (3). Sickle cell and thalassemia are inherited types of anemia caused by abnormal red blood cells (4, 5). These are just a few of the types of anemia. Hb and Hct results allow WIC staff to identify participants who would benefit from further follow-up by their health care provider. Given that IDA is the most common type of anemia in children and women of childbearing age this write-up focuses on IDA. While neither a Hb nor Hct test are direct measures of iron status and do not distinguish among different types of anemia, these tests are useful screening tools for IDA (2).

Iron is present in all cells in the body and serves several vital functions. Iron is an essential component of Hb, a red blood cell protein that carries oxygen from the lungs to the rest of the body (2). Iron is involved in the synthesis of hormones as well as normal growth and development. Iron deficiency (ID) occurs when the body's iron stores are depleted. ID may be caused by a diet low in iron, insufficient absorption of iron from the diet, increased iron requirements due to growth or pregnancy, or blood loss. Groups at risk of ID include: pregnant women, infants and young children, women with heavy menstrual bleeding, frequent blood donors, and people with cancer, gastrointestinal disorders or heart failure (2). ID progresses to IDA when iron stores become so low that hemoglobin production is disrupted. Changes in Hb concentration and Hct occur at the late stages of ID. IDA is associated with gastrointestinal disturbances, diminished physical work capacity, impaired thermoregulation, immune dysfunction, and Helicobacter pylori infection (6). There are additional risks associated with IDA in infants, children and pregnant women detailed below.

Iron in the Diet

Dietary sources of iron come in two major forms: heme and nonheme iron. Heme iron is well absorbed and found primarily in animal food sources, including red meat, liver, poultry, and fish. Nonheme iron is not as well absorbed and is found in foods from plants. Dietary sources of nonheme iron include iron-fortified grain products, legumes, fruits, and green leafy vegetables. Because nonheme iron is less bioavailable, the iron requirement for vegetarians is 1.8 times higher (7). Additional factors can also affect iron absorption. Consumption of vitamin C-rich foods and meat, fish or poultry increase the absorption of nonheme iron.
Phytates, found in grains and beans, and some polyphenols, such as those found in cereals and legumes, can inhibit nonheme iron absorption (8). Calcium is linked to a reduction in the absorption of both heme and nonheme iron. The effects of enhancers and inhibitors on iron absorption are diminished by a typical mixed western diet and do not significantly impact most people's iron status (2). Iron absorption, namely nonheme iron, is also dependent on an individual's iron status. In a state of iron sufficiency iron absorption decreases, while absorption increases in a state of ID (8, 9).

Iron Deficiency Anemia in Women

Women of childbearing age require additional iron, when compared to male counterparts, to make up for blood loss during menstruation, increased needs during pregnancy and blood loss at delivery and postpartum. In addition to high iron needs, women often under consume iron putting this group further at risk for IDA (2). Additional risk factors for the development of IDA in pregnant women include: adolescent pregnancy, gestational diabetes and multiparity (10, 11). (For more information on adolescent pregnancy, gestational diabetes and multiparity see risk #331 Pregnancy at a Young Age, risk #302 Gestational Diabetes, risk #303 History of Gestational Diabetes and risk #335 Multi-fetal Gestation). The strongest predictors of IDA in postpartum women are IDA during pregnancy and high blood loss during delivery (12).

Pregnant women are at particular risk due to their increased iron needs. Pregnant women need almost twice as much iron as those who are not pregnant to support increased red blood

cell production and the development of the fetus and placenta (13). The Recommended Dietary Allowance (RDA), the average daily level of intake sufficient to meet the nutrient requirements of nearly all (97%–98%) healthy individuals, for iron in pregnant women is 27 mg per day; the RDA for iron in non-pregnant women 14-18 years old and 19- 50 years old is 15 mg and 18 mg respectively (7). Based on data from the National Health and Nutrition Examination Survey (NHANES), 2001-2014, the average iron intake from food for pregnant women aged 20 to 40 years was 17.2 mg, well below the RDA (14). Given the high iron requirements during pregnancy and insufficient intake from foods, iron supplementation is often recommended during pregnancy (2). Based on data from NHANES, 1999-2010, 16.3% of pregnant women 12-49 years old in the United States had ID, including 2.6 with IDA (15). Data also showed that ID was more prevalent in women in the second or third trimester, Mexican American pregnant women, non-Hispanic black pregnant women, and women with parity greater than or equal to 2.

In addition to the effects of IDA mentioned above, IDA during pregnancy is associated with several negative fetal and maternal outcomes. Maternal IDA increases an infant's risk for low birth weight, premature birth, death, and impaired cognitive and behavioral development (2, 16, 17). IDA during pregnancy also increases the risk of maternal death (17). A long history of studies supported the belief that the fetus is protected from any impact of maternal iron status, however, a better understanding of regulation of iron physiology and neonatal iron status is challenging this assumption. Newer literature indicates fetal iron stores may be compromised when maternal iron stores are suboptimal, linking IDA during pregnancy with IDA in infants (16, 18, 19, 20, 21).

While the negative outcomes associated with IDA during pregnancy are well documented, additional research is needed to establish a clear causal relationship. IDA can also be a marker for food insecurity or lack of prenatal care, which can have similar effects (16). In a review of published reports, maternal iron supplementation has been shown to improve maternal iron status, however, the evidence is unclear on whether this increase leads to improvement in maternal and fetal health outcomes (17).

Iron Deficiency Anemia in Infants and Children

Infants and children are at risk for ID and IDA given their high iron requirements to support their rapid growth. The prevalence of anemia and possibly ID and IDA in infants and children has declined since the 1970s in the United States, and many attribute this decline to the fortification of infant formula and cereal and the establishment of the WIC program (22, 23). Based on data from the 2007–2010 NHANES 7.1% of children aged 1-5 were iron deficient and 1.1% had IDA (24). The rates of ID and IDA were higher in 1 to 2-year-olds at 13.5% and 2.7% respectively. There are no current national statistics regarding the prevalence of ID and IDA in infants before 12 months of age. Based on CDC recommendations, WIC regulations require a hematological test to screen for anemia during the following timeframes for infants and children (25):

- Infants: 9 to 12 months of age.
- Children 1-2 years: One blood test is required between 12 to 24 months of age, ideally 6 months after the infant screen (around 15 to 18 months

of age).

- Children 2-5 years: Once every 12 months for children 2-5 years of age whose blood test results were within the normal range at their last certification.

Iron is essential for normal neurodevelopment of infants and children. Numerous studies have linked IDA in infants and children to later adverse cognitive, motor and behavior effects (22). Cognitive deficits and the impact of IDA can be long lasting and may be irreversible, even with treatment (19, 26). It has been difficult to establish a causal relationship between IDA and these deficits due to confounding variables and difficulty in designing and executing the large-scale studies needed to demonstrate a direct link (22, 27). IDA can also increase susceptibility to lead poisoning by increasing intestinal lead absorption (22). (For more information on lead poisoning see Risk #211 Elevated Blood Levels).

While all infants and children are at risk of IDA due to their rapid growth, additional factors can place infants and children at higher risk. The table below outlines risk factors for IDA in infants and children:

Risk Factor	Additional Information
History of Prematurity*	Preterm infants miss out on the rapid accumulation of iron that occurs in the last trimester of pregnancy, are born with lower iron stores and are at risk of depleting their iron stores earlier than full term infants (22, 18, 26).
History of low birth weight or small for gestational age †	Low birth weight and small for gestational age infants are more likely to have lower iron stores that are unable to support the catch-up growth often seen in these infants (11, 18, 22).
Exclusive breastfeeding beyond 4 months of age without supplemental iron	While the iron breast milk contains is highly bioavailable, it is very limited. Full-term infants usually have adequate iron stores for 4 to 6 months but become at risk of developing iron deficiency at 6 to 9 months, unless they obtain adequate iron from complementary foods, iron-fortified formula or iron supplementation (11, 22).
Dietary habits linked with inadequate iron intake	The following dietary habits may increase an infant or child's risk for inadequate iron intake: use of non-iron fortified formula, introduction of cow's milk in the first year of life, weaning to whole milk or complementary foods that do not include iron-fortified cereals or foods naturally rich in iron (11, 22).
Maternal IDA	Infants born to mothers with IDA during pregnancy may be born with lower iron stores and are more likely to develop IDA as infants and children (22).
Feeding problems, poor growth, and inadequate nutrition‡	These challenges, which are often seen in infants with special care needs, are considered risk factors (22).

Demographic factors	Low socioeconomic status and having parents who are migrant workers or recent immigrants are also associated with increased risk (27).

* For more information on prematurity see Risk #142 *Preterm or Early Term Delivery.*

† For more information on low birth weight or small for gestation see Risk #141 *Low Birth Weight and Very Low Birth Weight* and Risk #151 *Small for Gestational Age.*

‡ For more information on special care needs see Risk #362 *Developmental, Sensory or Motor Disabilities Interfering with the Ability to Eat.*

Implications for WIC Nutrition Services

The WIC food package is designed to include foods that contain specific nutrients to improve the health status of program participants, address inadequate intakes, and, ultimately, prevent nutrient deficiencies such as ID and IDA. Nutrition education combined with the WIC food package can help decrease the likelihood that an individual would develop IDA.

For individuals who currently have low Hb or Hct, WIC staff can:

- Refer participants to their health care provider for more thorough testing as appropriate. Only a health care provider can diagnose anemia and determine the specific type and cause.
- Reinforce treatment plans, such as iron supplementation, provided by the health care provider, and refer participants to health care providers for medical follow-up care.
- Per State policy, provide follow up testing/referrals at future appointments.
- Discuss lead testing with participant or parent/caregiver and refer to appropriate resources if needed.
- Reiterate infant feeding guidance such as providing iron-fortified infant formula for infants not breastfed or partially breastfed for the first year of life and offering iron-rich or iron fortified complementary foods around 6 months of age.
- For breastfed infants, refer to healthcare provider to determine if iron supplementation is needed before 6 months of age, see:
    - to https://www.cdc.gov/breastfeeding/breastfeeding-special-circumstances/diet- and-micronutrients/iron.html
- Encourage consumption of iron-rich foods (with an emphasis on the foods in the WIC food package): Lentils and beans, fortified cereals, red meat, fish, and poultry, for more information, see:
    - https://ods.od.nih.gov/factsheets/Iron-HealthProfessional/#h3
- Encourage consumption of foods rich in Vitamin C to aid in iron absorption: Citrus fruits, tomatoes, and other fruits and vegetables, for more information see:
    - http://ods.od.nih.gov/factsheets/VitaminC-HealthProfessional/

Clarification

Basis for blood work assessment: For pregnant women being assessed for iron deficiency anemia, blood work must be evaluated using trimester values established by CDC. Thus, the blood test result for a pregnant woman would be assessed based on the trimester in which her blood work was taken.

Definition of Trimester: CDC defines a trimester as a term of three months in the prenatal gestation period with the specific trimesters defined as follows in weeks:

- First Trimester: 0-13 weeks
- Second Trimester: 14-26 weeks
- Third Trimester: 27-40 weeks

Further, CDC begins the calculation of weeks starting with the first day of the last menstrual period. If that date is not available, CDC estimates that date from the estimated date of confinement (EDC). This definition is used in interpreting CDC's Prenatal Nutrition Surveillance System data, comprised primarily of data on pregnant women participating in the WIC Program.

Adjustments for smoking: A State agency may elect to use only one cutoff for all smokers rather than making specific adjustments based on the individual applicant's smoking frequency. If the State chooses to use only one category for this issue, the "up to <1 pack/day" cutoff values category as shown on Tables 201- A and 201-B is the only one that may be used.

Parameters for Auto Assignment
Auto assigned for all categories if hemoglobin is below specified value on table "Hemoglobin Levels Indicating Risk."

High Risk Flag
Must be manually selected

Justification for High Risk

Anemia is one of the most preventable and treatable nutritional deficiencies and is also one of the most common. Anemia during the first trimester is a risk factor for LBW and preterm birth. The greater the severity is of anemia in the pregnant woman, the higher the risk of preeclampsia, preterm delivery, LBW, or miscarriage. Maternal morbidities and LBW are also negatively associated with high hemoglobin levels >13.9 g/dL, which thicken the blood and slow oxygen delivery to tissues, causing cerebrovascular complications.

Iron deficiency and iron deficiency anemia (IDA) both have adverse effects on childhood cognitive and behavioral development. IDA in children occurs mostly between 6 months to 3 yrs of age when most repeated infections occur. Low hemoglobin levels are also a result from IDA and are a risk

factor for lower respiratory tract infections (LRTI). Children younger than 5 years of age suffer about an average of 5-6 episodes of LRTI every year. Anemia has been found to cause more episodes of pneumonia than bronchiolitis symptoms.

It is especially important to prevent an iron deficiency in infants and toddlers as this is a crucial time for growth and development. Anemia is known to have adverse effects on cognitive and behavioral development, which may be irreversible. Preventing anemia is a modifiable risk factor that can be treated with appropriate nutritional intervention. The WIC nutritionist can play an important role in decreasing the prevalence of this condition in women and children by:

- Providing a high iron food package
- Counseling
- Follow-up hematocrit/hemoglobin testing

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Altitude Levels: Use the altitude level for the clinic area where the applicant lives. Altitude levels of Utah's WIC clinics are summarized in the table below.

District	County/Clinic	Altitude
Bear River	Logan	4000-4999
Bear River	Brigham City	4000-4999
Bear River	Tremonton	4000-4999
Bear River	Randolph	6000-6999
Bear River	Garden City	5000-5999
Central	Nephi	5119
Central	Delta	4650
Central	Fillmore	5061
Central	Junction	5000-5999
Central	Loa	7020
Central	Manti	5800
Central	Richfield	5303
Davis	all clinics	4000-4999
Salt Lake	all clinics	4000-4999
San Juan	Blanding	6000-6999
San Juan	Monticello	7000-7999
San Juan	Montezuma Creek	4000-4999
San Juan	Monument Valley	5000-5999
Southeast	Moab	4000-4999
Southeast	Price	5000-5999
Southeast	Green River	4000-4999
Southeast	East Carbon	6000-6999
Southeast	Castle Dale	5000-5999
Southwest	St. George	2880
Southwest	Beaver	5895
Southwest	Panguitch	6670
Southwest	Cedar City	5800
Southwest	Kanab	4925
Summit	*Coalville	5000-5999
Summit	Park City	7000-7999
Summit	Kamas	5000-5999
Tooele	Wendover	4000-4999
Tooele	Tooele	5000-5999
TriCounty	Vernal	5000-5999
TriCounty	Roosevelt	5000-5999
Utah County	all clinics	4000-4999
Wasatch	Heber City	5000-5999
Weber-Morgan	Ogden	4000-4999

*Note: The community is at a different altitude level than the WIC clinic. Assign nutrition risk based on the participant's community of residence.

Hematocrit/hemoglobin Cut-Off Values

Use the hematocrit/hemoglobin value listed in the table below for the clinic area where the applicant lives (adjusted for trimester of pregnancy (for pregnant women), smoking (for women), and age (for children)). Each value in the table is the cutoff below which is considered low iron. The high risk low iron value is described on page 85.

201- A Hematocrit Values

Altitude	Smoking	1st trimester Hct <	2nd trimester Hct <	3rd trimester Hct <	Postpartum 12 - <15 years Hct <	Postpartum 15 - <18 years Hct <	Postpartum ≥ 18 years Hct <	Infant 6- < 12 mo Hct <	Child 1-2 yrs Hct <	Child 2-< 5 yrs Hct <
0-2999 ft	Nonsmoker	33.0	32.0	33.0	35.7	35.9	35.7	33.0	32.9	33.0
	< 1 pack/day	34.0	33.0	34.0	36.7	36.9	36.7			
	1-2 pks/day	34.5	33.5	34.5	37.2	37.4	37.2			
	> 2 pks/day	35.0	34.0	35.0	37.7	37.9	37.7			
3000-3999 ft	Nonsmoker	33.5	32.5	33.5	36.2	36.4	36.2	33.5	33.4	33.5
	< 1 pack/day	34.5	33.5	34.5	37.2	37.4	37.2			
	1-2 pks/day	35.0	34.0	35.0	37.7	39.7	37.7			
	> 2 pks/day	35.5	34.5	35.5	38.2	38.4	38.2			
4000-4999 ft	Nonsmoker	34.0	33.0	34.0	36.7	36.9	36.7	34.0	33.9	34.0
	< 1 pack/day	35.0	34.0	35.0	37.7	37.9	37.7			

	1-2 pks/day	35.5	34.5	35.5	38.2	38.4	38.2			
	> 2 pks/day	36.0	35.0	36.0	38.7	38.9	38.7			
5000-5999 ft	Nonsmoker	34.5	33.5	34.5	37.2	37.4	37.2	34.5	34.4	34.5
	< 1 pack/day	35.5	34.5	35.5	38.2	38.4	38.2			
	1-2 pks/day	36.0	35.0	36.0	38.7	38.9	38.7			
	> 2 pks/day	36.5	35.5	36.5	39.2	39.4	39.2			
6000-6999 ft	Nonsmoker	35.0	34.0	35.0	37.7	37.9	37.7	35	34.9	35.0
	< 1 pack/day	36.0	35.0	36.0	38.7	38.9	38.7			
	1-2 pks/day	36.5	35.5	36.5	39.2	39.4	39.2			
	> 2 pks/day	37.0	36.0	37.0	39.7	39.9	39.7			
7000-7999 ft	Nonsmoker	36.0	35.0	36.0	38.7	38.9	38.7	36.0	35.9	36.0
	< 1 pack/day	37.0	36.0	37.0	39.7	39.9	39.7			
	1-2 pks/day	37.5	36.5	37.5	40.2	40.4	40.2			
	> 2 pks/day	38.0	37.0	38.0	40.7	40.9	40.7			

6-B Hemoglobin Values

Altitude	Smoking	1st trimester Hgb <	2nd trimester Hgb <	3rd trimester Hgb <	Postpartum 12 - <15 years Hgb <	Postpartum 15 - <18 years Hgb <	Postpartum ≥18 years Hgb <	Infant 7- < 12 mo Hgb <	Child 1-2 yrs Hgb <	Child 2-< 5 yrs Hgb <
0-2999 ft	Nonsmoker	11.0	10.5	11.0	11.8	12.0	12.0	11.0	11.0	11.1
	< 1 pack/day	11.3	10.8	11.3	12.1	12.3	12.3			
	1-2 pks/day	11.5	11.0	11.5	12.3	12.5	12.5			
	> 2 pks/day	11.7	11.2	11.7	12.5	12.7	12.7			
3000-3999 ft	Nonsmoker	11.2	10.7	11.2	12.0	12.2	12.2	11.2	11.2	11.3
	< 1 pack/day	11.5	11.0	11.5	12.3	12.5	12.5			
	1-2 pks/day	11.7	11.2	11.7	12.5	12.7	12.7			
	> 2 pks/day	11.9	11.4	11.9	12.7	12.9	12.9			
4000-4999 ft	Nonsmoker	11.3	10.8	11.3	12.1	12.3	12.3	11.3	11.3	11.4
	< 1 pack/day	11.6	11.1	11.6	12.4	12.6	12.6			
	1-2 pks/day	11.8	11.3	11.8	12.6	12.8	12.8			

	> 2 pks/day	12.0	11.5	12.0	12.8	13.0	13.0			
5000- 5999 ft	Nonsmoker	11.5	11.0	11.5	12.3	12.5	12.5	11.5	11.5	11.6
	< 1 pack/day	11.8	11.3	11.8	12.6	12.8	12.8			
	1-2 pks/day	12.0	11.5	12.0	12.8	13.0	13.0			
	> 2 pks/day	12.2	11.7	12.2	13.0	13.2	13.2			
6000- 6999 ft	Nonsmoker	11.7	11.2	11.7	12.5	12.7	12.7	11.7	11.7	11.8
	< 1 pack/day	12.0	11.5	12.0	12.8	13.0	13.0			
	1-2 pks/day	12.2	11.7	12.2	13.0	13.2	13.2			
	> 2 pks/day	12.4	11.9	12.4	13.2	13.4	13.4			
7000- 7999 ft	Nonsmoker	12.0	11.5	12.0	12.8	13.0	13.0	12.0	12.0	12.1
	< 1 pack/day	12.3	11.8	12.3	13.1	13.3	13.3			
	1-2 pks/day	12.5	12.0	12.5	13.3	13.5	13.5			
	> 2 pks/day	12.5	12.2	12.7	13.5	13.7	13.7			

6-C Rounded Hematocrit Values

Altitude	Smoking	1st trimester Hct <	2nd trimester Hct <	3rd trimester Hct <	Postpartum 12 - <15 years Hct <	Postpartum 15 - <18 years Hct <	Postpartum ≥ 18 years Hct <	Infant 7- < 12 mo Hct <	Child 1-2 yrs Hct <	Child 2-< 5 yrs Hct <
0-2999 ft	Nonsmoker	33	32	33	36	36	36	33	33	33
	< 1 pack/day	34	33	34	37	37	37			
	1-2 pks/day	35	34	35	38	38	38			
	> 2 pks/day	35	34	35	38	38	38			
3000- 3999 ft	Nonsmoker	34	33	34	37	37	37	34	34	34
	< 1 pack/day	35	34	35	38	38	38			
	1-2 pks/day	35	34	35	38	38	38			
	> 2 pks/day	36	38	36	39	39	39			
4000- 4999 ft	Nonsmoker	34	33	34	37	37	37	34	34	34
	< 1 pack/day	35	34	35	38	38	38			
	1-2 pks/day	36	38	36	39	39	39			
	> 2 pks/day	36	35	36	39	39	39			
5000-	Nonsmoker	35	34	35	38	38	38	35	35	35

5999 ft	1-2 pks/day	36	35	36	39	39	39			
	> 2 pks/day	37	36	37	40	40	40			
	≥ 2 pks/day	37	36	37	40	40	40			
6000-	Nonsmoker	35	34	35	38	38	38	35	35	35
6999 ft	< 1 pack/day	36	35	36	39	39	39			
	1-2 pks/day	37	36	37	40	40	40			
	> 2 pks/day	37	36	37	40	40	40			
7000-	Nonsmoker	36	35	36	39	39	39	36	36	36
7999 ft	< 1 pack/day	37	36	37	40	40	40			
	1-2 pks/day	38	37	38	41	41	41			
	> 2 pks/day	38	37	38	41	41	41			

211 Elevated Blood Lead Levels

Definition/Cut-Off Value

Elevated blood lead level (BLL) is the amount of lead in the blood, measured in micrograms of lead per deciliter of blood (µg/dL), at which follow-up action should be taken for an individual. Elevated BLL is specific to each WIC participant category as follows (1, 2):

Category	Elevated Blood Lead Level (µg/dL) (within the past 12 months)
Women (all categories)	≥5
Infants	≥5
Children	≥3.5

* See Clarification section for more information about category specific elevated BLLs.
** See the Nutrition and Lead Exposure section below for recommendations on the initiation and continuation of breastfeeding.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	III, IV, V, or VI	N
Infant	I	N
Children	III	N

Parameters for Auto Assignment

Auto assigned for all categories if blood lead level was tested in the last year and was ≥ 3.5 µg/dl (children) or ≥5 µg/dl (women and infants) as designated in the Blood panel.

Justification

Lead exposure is a persistent public health problem in the U.S. and worldwide. A naturally occurring element that has been mined and used by humans for centuries, lead is toxic to humans with impacts ranging from changes in organ function to death. The toxic effects of lead have been observed in every organ system and there is no known safe level of exposure. Even low levels of lead exposure can have harmful and irreversible neurological, renal, cardiovascular, hematological, immunological, reproductive, and developmental effects. In addition to these most extensively studied outcomes, scientific evidence also suggests that lead exposure can have detrimental respiratory, hepatic, endocrine, gastrointestinal, musculoskeletal, and ocular effects, and increase risk of all cancers. (3)

Lead exposure during pregnancy or postpartum can adversely impact the mother as well as the developing fetus and breastfeeding infant during critical stages of development. Lead readily crosses the placenta, and lead exposure during pregnancy is associated with increased risk of miscarriage, preterm birth, and decreased birth size (weight, length and head circumference); fetal brain, kidney, and nervous system damage; and lifelong learning and behavior problems (2, 3). Lead can also transfer from maternal blood to breastmilk, and ultimately to the breastfeeding infant (2).

Lead exposure is most common in young children because they have greater contact with lead sources and higher gastrointestinal absorption of ingested lead. Additionally, children's developing nervous systems are more vulnerable to the effects of lead exposure. Elevated BLL in children has been associated with adverse neurological and behavioral outcomes including cognitive deficits (e.g., learning and memory), altered behavior and mood (e.g., attention, hyperactivity, impulsivity, irritably, delinquency), and altered neuromotor and neurosensory function (e.g., visual-motor integration, dexterity, postural sway, changes in hearing and visual thresholds). (3)

Prevalence of Lead Exposure

Over the four decades from 1976 to 2016, BLLs decreased significantly among children ages 1 to 5 years and among women of childbearing age (15 to 49 years) in the U.S. (4, 5). Specifically, during this timeframe, population average BLLs decreased from 15.2 to 0.83 µg/dL and 10.37 to 0.61 µg/dL for these groups, respectively. Correspondingly, the prevalence of BLL >5 µg/dL decreased from 99.8 to 1.3 percent among children ages 1 to 5 and from 98.3 to 0.7 percent among women of childbearing age. These favorable trends reflect the implementation of federal policies regulating the use of lead in gasoline, paint, plumbing, and other consumer products, among other public health interventions (6).

Despite this progress, sociodemographic disparities have persisted. Low-income and certain racial/ethnic minority populations continue to be disproportionately affected by lead exposure as a result of these groups more commonly living in communities and housing with greater lead contamination (4, 5).

Sociodemographic disparities in lead exposure vary by WIC participant category and are discussed further as follows.

Disparities among Women

According to the most recent NHANES data, over 500,000 women of childbearing age (15 to 49 years) in the U.S. have BLL ≥5 µg/dL. Lead exposure is more prevalent among certain subpopulations, including women with low-income, of older age, born outside the U.S., of "other" race/ethnicity (i.e., other than black, white, Hispanic, or Mexican American), previous pregnancies, and a higher number of live births. (5)

In particular, recent immigrants, migrants, and refugee women are at increased risk of lead exposure since they have commonly lived in areas where ambient lead exposure is relatively high. These groups may also be more likely to consume products contaminated with lead such as traditional remedies, herbal supplements, spices, candies, cosmetics, and jewelries or amulets. (7)

Disparities among Children

Between 2011 to 2016, an estimated 262,235 children aged 1 to 5 years had BLLs >5 µg/dL (note: the studies summarized here were conducted prior to October 2021, when the BLRV was >5 µg/dL). Subpopulations with greater prevalence of lead exposure include children of younger ages (i.e., 1 to 2 years old), non-Hispanic Black race/ethnicity, low-income (including children participating in WIC), and children born in Mexico, living in older housing, and living in the Northeast or Midwest regions of the U.S. compared to West and South regions. (4)

Between 1999 and 2016, population mean BLL was greatest for non-Hispanic Black children at all ages under 5 years compared to other racial/ethnic groups (non-Hispanic White, Hispanic, and Other) as was the proportion of non-Hispanic Black children ages 1 to 5 with BLL ≥5 µg/dL. Further, greater proportions of non-Hispanic Black children had higher BLLs, with Black children accounting for all children with BLL ≥40 µg/dL. (8)

Lead exposure is also more common among refugee children in the U.S., particularly among children from certain countries of origin and country of last residence (e.g., India, Afghanistan, Burma, and Nepal). Children, as well as adults, may also be at risk for elevated BLL after arrival due to continued use of lead-contaminated spices, candies, traditional cosmetics, and cookware. (7)

Sources of Lead Exposure

Lead exposure among the general population may occur through contact with soil, dust, drinking water, food, and air (3). The most common sources of lead exposure in the U.S. are lead-based paint chips and dust, lead-contaminated soil, and lead in drinking water (1). These exposures generally result from living in housing built before 1978, prior to when lead-based paint was banned, or with lead pipes or plumbing. An estimated 83 percent of privately owned homes and 86 percent of public housing family units built before 1980 contain lead-based paint (3). Additionally, up to 10 million households and 400,000 schools and childcare facilities connect to water through lead pipes and service lines (6, 9). Living near a highway, airport, powerplant, smelter, or hazardous waste site may also cause lead exposure through contaminated soil or air (2, 3).
Other sources of lead exposure include:

- Occupations that involve working with lead-based products, most commonly in the manufacturing, construction, services, and mining industries (10).
- Hobbies or activities that involve working with lead-based products such as casting, stained glass, pottery, painting, glassblowing and screen printing (3).
- Smoking cigarettes or e-cigarettes, chewing tobacco, and exposure to second-hand smoke (3).
- A variety of consumer products such as storage batteries, solders, tire weights, pottery glazes, leaded crystal glassware, cosmetics, hair dyes, jewelry, antiques, gunshot and ammunition, relic fishing sinkers, and imported children's toys (3).
- Imported foods, candies, and spices, including:
    - Candy with ingredients such as chili powder and tamarind (lead can get into the candy when drying, storing, and grinding the ingredients are done improperly). Ink

from plastic or paper candy wrappers may also contain lead that leaches or seeps into the imported candy (11).
    - Certain commonly used spices, particularly those purchased abroad in Georgia, Bangladesh, Pakistan, Nepal, and Morocco (12).
- Cultural and traditional medicines, including (7):
    - Ba-baw-san: a Chinese herbal remedy used to treat colic pain or to pacify young children.
    - Daw Tway: a digestive aid used in Thailand and Myanmar (Burma).
    - Greta and Azarcon (also known as alarcon, coral, luiga, maria luisa, or rueda): Hispanic traditional medicines used for an upset stomach, constipation, diarrhea, and vomiting. They are also used on teething babies.
- For additional examples, refer to the CDC's table of Examples of regional or culture-specific exposures associated with elevated blood lead levels in children (7).

Among pregnant and lactating women, the most common sources of lead exposure include (3):

- Working in certain occupations.
- Practicing pica (ingesting non-nutritive substances such as soil or paint chips).
- Using herbal or traditional remedies or imported cosmetics.
- Using traditional lead-glazed ceramic pottery for cooking and storing food.
- Living in an older home during a renovation.
- History of lead exposure since bone lead stores persist for decades and are mobilized into the blood during periods of increased bone turnover including pregnancy and lactation.

The primary source of lead exposure among children ages 1 to 5 in the U.S. is soil and surface dust contaminated with lead. Young children are particularly susceptible to lead exposure due to their increased contact with dust, dirt, and surfaces potentially contaminated with lead and frequent hand-to mouth-activity. Children living in older housing with lead-based paint (especially deteriorated paint), are at higher risk for lead exposure. Among children with lower BLL or living in certain communities, other exposure sources such as lead in drinking water and food may be more significant. (3)

Lead Screening and Testing

Lead exposure prevention and reduction are possible, and such primary prevention strategies are critical to preventing long-term damage that can result from even low-level lead exposure. However, because lead is ubiquitous in the environment, secondary prevention is necessary to identify and follow children who are exposed to lead. CDC recommends that public health and clinical professionals focus screening efforts on neighborhoods and children at high risk based on age of housing and sociodemographic risk factors and work together to develop screening plans responsive to local conditions using local data. CDC supports these efforts through cooperative agreements with state and local health departments that fund lead exposure prevention activities including blood lead testing (13). Where state or local screening plans do not exist, CDC recommends universal BLL testing (1).
For pregnant women, CDC recommends against universal blood lead testing of all pregnant women in the U.S. Instead, state or local public health departments should identify populations at

increased risk for lead exposure and provide guidance about community-specific risk factors to assist clinicians in determining the need for blood lead testing for identified populations or individuals at risk. Follow-up blood lead testing is recommended for pregnant women with BLL ≥5 µg/dL and their newborn infants. Pregnant women identified with blood lead levels ≥5 µg/dL should be tested at the time of birth to establish a baseline to guide postnatal care for the mother and infant. Lactating women with BLL ≥5 µg/dL should be referred for follow-up testing at an interval according to the BLL. (2)

For children, CDC recommends blood lead screening for those at high risk for elevated BLL with follow-up screening within 12 months and specific follow-up actions depending on an individual's BLL. For additional information, refer to the CDC's Recommended Actions Based on Blood Lead Levels. (14)

All Medicaid-enrolled children are required to be tested at ages 12 and 24 months, or at age 24–72 months if they have not previously been screened (15).

For infants, the American Academy of Pediatrics recommends a risk assessment at 6 and 9 months, and if positive, appropriate follow up action. Risk assessment questions appropriate to local lead hazards should be developed by local health care professionals in collaboration with state, county, or local health authorities (16).

CDC's specific screening guidelines for newly arrived refugees recommend that all refugee infants and children <16 years old and pregnant and breastfeeding women be screened for lead exposure with a blood test. Refugee adolescents > 16 years of age should be screened if there is a high index of suspicion, or clinical signs/symptoms of lead exposure. Follow up screening should occur 3 to 6 months later for all children under 6 years old, children and adolescents 7 to 16 years of age who had BLLs ≥3.5 µg/dL or who has a risk factor, and pregnant or lactating adolescents (<18 years of age) who had BLLs at or ≥3.5 µg/dL at initial screening. In addition, all newly arrived pregnant or breastfeeding women should be prescribed a prenatal or multivitamin with adequate iron and calcium. (7)

Note: Venous blood samples are the most accurate method of blood lead testing. Elevated BLLs obtained using capillary (finger stick) samples should be confirmed using a venous blood test (2).

Nutrition and Lead Exposure

Adequate intake of certain vitamins and minerals may mediate the absorption of lead and thereby the impacts of lead exposure. Specifically, adequate consumption of both calcium and iron, which compete with lead for intestinal absorption, have been found to decrease lead absorption (2). During pregnancy, adequate calcium intake may reduce maternal bone resorption and thereby reduce the mobilization of lead stored in the bone into the blood (17). Iron deficiency can be an indicator of lead poisoning as they often co-occur (see risk #201 for more information about iron deficiency anemia). Participants with elevated BLL should be provided with nutritional advice emphasizing adequate calcium and iron intake and pregnant participants should be encouraged to take a prenatal vitamin as prescribed by their healthcare provider (7).

While lead can be passed to breastfeeding infants through human milk, research suggests that the amount of blood lead transferred into breastmilk is minimal and hence breastmilk has a relatively small impact on infant BLL (7). CDC has developed breastfeeding recommendations specific to maternal BLL based on the available science.

For breastfeeding women, CDC recommends the following (2):

- Initiation of Breastfeeding:
  - Mothers with BLL <40 µg/dL should breastfeed.
  - Mothers with confirmed BLL >40 µg/dL should begin breastfeeding when their blood lead levels drop below 40 µg/dL. Until then, they should pump and discard their breastmilk.
- Continuation of Breastfeeding:
  - Breastfeeding should continue for all infants with BLL <5 µg/dL.
  - Infants born to mothers with BLL >5 µg/dL and <40 µg/dL can continue to breastfeed unless there are indications that the breast milk is contributing to elevated BLL.

Justification for High Risk

Not Applicable

Implications for WIC Nutrition Services

WIC nutrition services may benefit participants with elevated BLL by:

- Making recommendations for primary prevention of lead exposure, which may include (18):
  - Avoiding relevant risk factors (e.g., certain traditional medicines and cosmetics, imported or antique children's toys, imported or pottery dishes, and imported spices and candies).
  - Referring the participant to a licensed lead inspector to have their home tested for lead.
  - Referring the participant to the local water authority for testing for lead in tap water.
  - Washing children's hands after playing outside, regularly washing pacifiers, toys, etc., and removing shoes when entering the house.
- Encouraging consumption of foods (with an emphasis on the foods available in their WIC food package) with nutrients that help minimize absorption of ingested lead and assist in preventing adverse consequences, including:
  - Calcium: Low-fat dairy, bone-in canned fish, and fortified fruit and vegetable juices (19). For more information see: http://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/
  - Iron: Lentils and beans, fortified cereals, red meats, fish, and poultry (20). For more information see: http://ods.od.nih.gov/factsheets/Iron-HealthProfessional/
- Helping to determine source(s) of lead exposure and counseling participants on avoiding exposure, including by:
  - Assessing pica behavior (for more information, see Risk #427 Inappropriate Nutrition Practices for Women and Risk #425 Inappropriate Nutrition Practices for Children).
  - Working with local lead programs to determine source(s) of lead exposure and to support their recommendations for reducing further exposure.

    - Information about State and local childhood lead poisoning prevention and surveillance programs can be found here (13): Lead Funding Information | CDC
- Referring participants to lead screening/testing: WIC agencies must ask parents/caretakers if the child they are enrolling in WIC has had a blood lead screening test; any child who has not had a test must be referred to a program where they can obtain one.
- Providing a referral to a lead treatment program via the local health departments.
- Working with healthcare providers to support breastfeeding according to CDC guidelines. This may include providing breastfeeding support to mothers with elevated BLLs who need to temporarily pump and discard their milk.

Clarification

The Definition/ Cut-off Value for each WIC participant category is based on current CDC guidelines. It is important to note that these values are not a health standard or toxicity threshold, but a guide to help determine when medical or environmental follow-up actions should be taken for an individual.

For women and infants, the values are adopted from CDC's Guidelines for the identification and management of lead exposure in pregnant and lactating women (cdc.gov) (2).

For more information, refer to the following tables in this guidance:

- For infants, Tables 5-1 and 5-2 for Infants (pages 58-59). For simplicity and consistency, WIC is applying BLL ≥5 for all infants (CDC guidance varies by infant <1 month vs <6 month and does not address infants 6-12 months).
- For women, Tables 5-3 (page) and 9-1 (page 103).

For children, the value is the current Blood Lead Reference Value (BLRV), a population measure developed by the Centers for Disease Control and prevention (CDC) to identify children ages 1 to 5 years old with higher levels of lead in their blood compared to 97.5 percent of children in the United States (U.S.). The CDC established the BLRV in 2012 and updated it in 2021 (from 5 to 3.5 µg/dL) based on current national BLL data from the National Health and Nutrition Examination Survey (NHANES). (1)

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301 Hyperemesis Gravidarum

Definition/Cut-Off Value

Hyperemesis Gravidarum (HG) is defined as severe and persistent nausea and vomiting during pregnancy which may cause more than 5% weight loss and fluid and electrolyte imbalances (1). This nutrition risk is based on a chronic condition, not single episodes. HG is a clinical diagnosis, made after other causes of nausea and vomiting have been excluded.

Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel.

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned.

Justification

Nausea and vomiting are common early in gestation; 50-80% or more of pregnant women experience some vomiting. However, pregnant women diagnosed with HG are at risk of weight loss, dehydration, ketonuria, and electrolyte imbalances such as hypokalemia. HG affects approximately 0.3-3.0% of pregnancies and may lead to adverse fetal consequences and hospitalization in some cases. HG is the second most common reason for hospitalization for pregnant women, with preterm labor being the most common (2).

Risk Factors for HG

Biological, physiological, psychological and sociocultural factors are thought to be influential in HG (3). The various risk factors for HG include maternal underweight, multiple pregnancy, nulliparity, previous history of HG and trophoblastic disorders (see clarification). A history of eating disorders, such as anorexia nervosa or bulimia, is also a risk factor associated with HG (4, 5). Helicobacter pylori infection may be a contributing factor for HG

(6). Studies indicate that offspring or siblings of women with HG, and/or women pregnant with a female fetus, have increased chances of having HG. A history of motion sickness and/or migraine headaches are also risk factors for HG (7).

Various hormones such as estrogen, progesterone, adrenocorticotropic hormone, cortisol, growth hormone, prolactin and human chorionic gonadotropin (HcG) play an influential role in HG. Increased levels of HcG, which may occur in molar (see clarification) or multi fetal pregnancies may be associated with HG. Studies indicate that HG increases when HcG level reaches its peak at 9 weeks of gestation (8). It should be noted that thyroid function is affected in pregnancy. For pregnant women with hyperthyroidism, decreased levels of thyroid stimulating hormone may be implicated for HG (9, 10).

HG and Adverse Maternal Outcomes

HG can adversely affect maternal outcomes and, if inadequately managed, can lead to malnutrition, dehydration, electrolyte imbalances, thrombosis, and Wernicke's encephalopathy (a very rare but potentially life-threatening complication of HG, caused by thiamine deficiency) (11). Vitamin K deficiency has also been reported with HG and may be implicated in neonatal hemorrhage (12). Other serious complications include esophageal rupture (caused by severe vomiting), peripheral neuropathy, coagulopathy and Mallory-Weiss syndrome (acute increase in esophageal pressure due to vomiting) (8).

Studies indicate that pregnant women with HG in the second trimester are also at an increased risk for placental disorders, such as placental abruption (13). Pregnant women with HG are at an increased risk for any autoimmune disorder, and in extreme cases this may lead to organ damage manifesting as oliguria and abnormal liver function tests (14). In addition, pregnant women with HG are at increased risk for psychological distress therefore leading to an increased risk for depression and anxiety (15). Other concerns associated with HG include severe distress, social dysfunction and loss of time from work (16, 17).

Malnourishment may develop over a period of time in women suffering with HG, which may lead to refeeding syndrome (RFS). RFS includes severe metabolic abnormalities and electrolyte disturbances due to the change from catabolic to anabolic metabolism that occurs when refeeding (orally, parentally, or enterally) occurs too quickly after severe malnourishment. RFS requires multidisciplinary nutrition team management as it is a life-threatening condition (18).

HG and Adverse Birth Outcomes

Systematic review and meta-analysis indicate that HG is frequently associated with adverse birth outcomes (19). Women with HG have an increased risk of giving birth to low birth weight, small for gestational age, and premature infants (20). Infants born to mothers suffering from HG have increased risk of colic, irritability, and growth restrictions (21). There is a scarcity of data examining the long-term effect on fetuses exposed to HG in utero. However, some studies indicate that there is an increased risk of psychological disorders and reduced insulin sensitivity for infants born to women with HG (22, 23).

Implications for WIC Nutrition Services

WIC nutrition staff can provide the following nutrition services to women with HG:

- Refer to a health care provider for appropriate monitoring and treatments as necessary.
- Provide education on how to recognize symptoms of dehydration such as: Increased thirst, dry mouth, low urine output or urine that is darker in color than normal.
- Offer suggestions to help with nausea such as:
  - Avoid foods and smells that seem to trigger nausea (e.g., fried or greasy foods, spicy foods, foods of a certain texture).
  - Eat crackers or dry cereal before getting out of bed to curb nausea in the morning.
  - Avoid large fluid intakes in the morning. Drink liquids between meals instead of with meals.
  - Choose foods carefully. Select foods that are high in carbohydrates or protein, low in fat, and easy to digest.
  - Salty foods are sometimes helpful, as are foods that contain ginger, such as ginger lollipops.
  - Avoid greasy, spicy and fatty foods.
  - Consume foods that settle the stomach and calm the nausea. (24)
  - Eat several small meals throughout the day instead of three large meals. Meals should contain more carbohydrate than fat and acid. Protein-rich meals also decrease symptoms. Lighter snacks, including nuts, dairy products, and beans, are recommended. (25)
  - Take prenatal supplements at night or before bedtime.
- Review weight gain goal and weight gain pattern. If weight loss is a problem, discuss nutrient and calorie-dense food choices and refer to the health care provider.
- Encourage women to take prenatal vitamins if considering becoming pregnant again. Studies indicate that taking prenatal vitamins a month before conception may help alleviate the symptoms of HG during pregnancy (26).

Clarification

Self-reporting of a diagnosis by a health care provider should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

Gestational Trophoblastic Disease (GTD) may be defined as a condition in which a tumor develops in the uterus that would normally develop as a placenta. Molar pregnancy or a hydatidiform mole may be classified as a form of noninvasive tumor under GTD. A molar pregnancy results from an abnormal fertilization of the egg lacking in maternal tissues. It should be noted that although the tumor is considered benign, they have potential to become malignant. The symptoms include vaginal bleeding, hyperemesis, preeclampsia, and hyperthyroidism. (27)

Justification for High Risk

Women who are experiencing hyperemesis gravidarum are at risk for weight loss, dehydration, and metabolic imbalances. Women with this condition may also be plagued with insomnia, extreme fatigue and nausea for most or all of the pregnancy.

Extreme weight loss (> 15% of pre-pregnancy weight) can be common among women with this condition and is labeled as a form of “prolonged starvation”. This state can have dire long-term effects that can be avoided with initial management of symptoms through diet and supportive counseling.

Women who are diagnosed with hyperemesis gravidarum are more likely to give premature birth and have LBW and SGA children. There is also a higher incidence of spontaneous preterm birth. Aside from physical symptoms, women may also experience cognitive, behavioral and emotional dysfunction associated with hypermesis gravidarum.

The WIC nutritionist can play a vital role in helping pregnant women identify triggers for nausea and develop their own techniques and diet for relief and ultimately help them experience the joys of pregnancy. WIC services can also help prevent further weight loss and provide education on how to avoid dehydration.

Additional Counseling Guidelines

- Encourage participant to keep a diary to identify triggers for nausea - include time of day, foods eaten, smells, activities, and stimuli like lights and noise.
- Recommend appropriate calorie and fluid intake.
- Recommend small, frequent meals.
- Encourage eating foods that are craved.
- Experiment with different types of foods such as salty, bitter or sour.
- Encourage foods that are rich in carbohydrates and low in fat and acid.
- Electrolyte-replacement drinks and oral nutritional supplements may be advisable to maintain electrolyte balance.
- Protein-predominant meals may help reduce nausea.
- Counsel women to discuss possibility of calcium supplementation with their health care provider.

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302 Gestational Diabetes

Definition/Cut-Off Value

Gestational diabetes mellitus (GDM) is defined as any degree of glucose/carbohydrate intolerance with onset or first recognition during pregnancy (1, 2).

Presence of gestational diabetes diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel.

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned.

Justification

The definition of GDM applies regardless of whether insulin or only diet modification is used for treatment, or whether the condition persists after pregnancy. Included in this classification are women who may have had undiagnosed diabetes prior to pregnancy, but who are first diagnosed during pregnancy (1, 2). Pregnant women requiring the use of exogenous steroids, tocolytics, or other medications, or who have medical conditions that alter glucose tolerance, may develop GDM (2). GDM represents nearly 90% of all pregnancies complicated by diabetes (1). The criteria for the diagnosis of GDM (3) are shown in Table 1 (see Clarification).

Pregnancy is an insulin-resistant and diabetogenic state (2). Deterioration of glucose tolerance occurs normally during pregnancy, particularly in the 3rd trimester (1, 2). Untreated or poorly treated GDM results in a higher risk of morbidity and mortality for both the mother and the fetus (2).

Established risk factors for GDM are advanced maternal age, obesity, and family history of diabetes (4). Risk assessment for GDM should be undertaken at the first prenatal visit. Women with clinical characteristics consistent with a high risk for GDM (e.g., those with marked obesity,

personal history of GDM or delivery of a previous large-for-gestation-age infant, glycosuria, polycystic ovary syndrome, or a strong family history of diabetes) should undergo glucose testing as soon as possible (5). Unquestionably, there are also ethnic differences in the prevalence of GDM. In the U.S., Native Americans, Asians, Hispanics, and African American women are at a higher risk for GDM than non-Hispanic White women. Besides obesity, there is a suggestion that physical inactivity, diets high in saturated fat and smoking are associated with increasing risk for GDM or recurrent GDM (4).

Infants of women with GDM are at an increased risk of developing obesity, impaired glucose tolerance or diabetes as children or young adults (4). GDM is associated with a higher incidence of maternal and fetal complications. Maternal complications include polycythemia, respiratory distress syndrome, and increased rate of stillbirth (6). Although rarely seen in GDM, congenital anomalies, neural tube defects, cardiac abnormalities and/or caudal regression may occur if a woman has GDM in the early first trimester (6, 7).

Since GDM is a risk factor for subsequent type 2 diabetes after delivery, lifestyle modifications aimed at reducing weight and increasing physical activity are recommended (8). The National Diabetes Education Program (NDEP) is currently promoting a GDM Prevention Initiative, targeting both providers and women with a GDM history (9). Key messages are illustrated in Table 2 (see Clarification).

Medical Nutrition Therapy (MNT) is the primary treatment for the management of GDM (7). MNT for GDM primarily involves a carbohydrate-controlled meal plan that promotes optimal nutrition for maternal and fetal health with adequate energy for appropriate gestational weight gain, achievement and maintenance of normoglycemia, and absence of ketosis (7, 8). Breastfeeding should be strongly encouraged as it is associated with maternal weight loss and reduced insulin resistance for both mother and offspring (10). WIC nutrition services can reinforce and support the medical and diet therapies (such as MNT) that participants with GDM receive from their health care providers.

Justification for High Risk

Data suggests that even minor abnormalities in maternal glucose metabolism will cause increases in infant birth weight and put mother and infant at risk for complications. These complications include birth weight above 90th percentile, cesarean delivery, hypoglycemia, premature delivery, preeclampsia, birth injury, NICU admission and hyperbilirubinemia. Increased maternal blood glucose levels at 24-28 weeks increases these risks associated with GDM and adiposity. Even if levels are below the threshold of diabetes; it is important to monitor blood glucose during pregnancy. Mothers with GDM are also at an increased risk of developing type-2 diabetes later in life when compared to women who did not have gestational diabetes (4).

Women who had mild gestational diabetes reduced the risk of fetal overgrowth, caesarean delivery and hypertensive disorders, when treated with nutritional counseling, diet therapy and insulin injections (if required). The WIC nutritionist can play a vital role in assuring the participant receives comprehensive counseling and follow-up by appropriate health care providers outside of WIC.

Additional Counseling Guidelines

- Remember, women with gestational diabetes often feel well and are in their last trimester of pregnancy; therefore, they may be casual about their treatment
- Emphasize the positive outcomes for treatment with gestational diabetes
- Explain potential risks to mother, such as:
    - Fatigue
    - Difficult labor and cesarean delivery
    - Increased risk of infection
    - Toxemia and preeclampsia
    - Diabetes after the pregnancy ends
- Inform participant of potential risks to infants, such as:
    - Large birth size (macrosomia)
    - Low blood sugar after birth
    - Jaundice
    - Respiratory distress syndrome
    - Cardiovascular problems
    - Kidney dysfunction
    - Hypocalcemia
    - Fetal death in extreme cases
- Explain relationship between diet, insulin and exercise
- Provide basic counseling on diet which provides nutrient needs for pregnancy and facilitates normal blood glucose levels:
    - Encourage participants to consume calories adequate for recommended weight gain but not excessive weight gain
    - Recommend diet which contains approximately 40-50% carbohydrate, 20-25% protein and 30-35% fat
    - Activity Factor - Add 40-60% of basal needs for light activity
- Keep timing of meals consistent from day to day with calorie and carbohydrate content fairly evenly divided from meal to meal
- Recommend increased intake of high fiber foods and complex carbohydrates
- Counsel on importance of not consuming foods high in refined sugar and juice
- Plan for food to be taken to correct hypoglycemic episodes
- Plan for food and fluids to be taken for periods of increased physical activity and illness
- Plan for a bedtime snack to prevent nocturnal hypoglycemia
- Eat mid-morning and mid-afternoon snacks, if needed
- Encourage moderate regular exercise
    - Exercise after snack or meal
    - Don’t exercise if blood glucose is < 80 mg/dL or higher than 250 mg/dL
    - Eat carbohydrates in case of hypoglycemia
    - Always exercise with a partner in case blood sugar drops
- Stress importance of maternal follow-up during prenatal period, postpartum period and annually
- Stress importance of maintaining healthy body weight

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

Women at high risk for GDM who have tested negative at the initial screening, and women at average risk for GDM should be tested by a licensed medical provider, between 24 and 28 weeks of gestation. Women of average risk should be tested at 24-28 weeks of gestation. Testing should follow one of two approaches:

One-step approach:

- Perform a diagnostic 100-g OGTT (Oral Glucose Tolerance Test)

Two-step approach:

- A screening test (glucose challenge test) that measures plasma or serum glucose is done 1 hour after a 50-g oral glucose load without regard for time of day or time of last meal. If a plasma or serum glucose level meets or exceeds the threshold (>130 mg/dl [7.2 mmol/L] or >140 mg/dl [7.8 mmol/L], respectively), an OGTT is performed (3).

- A diagnosis of GDM is made with a 100-g oral glucose load after an overnight fast. Using a 3-hour test, if two or more plasma or serum glucose levels meet or exceed the threshold, a diagnosis of GDM is made. Alternatively, the diagnosis can be made using a 75-g oral glucose load. The glucose threshold values for both tests are listed in Table 1 (10). The 75-g glucose load test is not as well validated as the 100-g OGTT.

With either the 75-g OGTT or the 100-g OGTT, it is recommended that the test be performed after an overnight fast of at least 8 hours but no longer than 14 hours. For 3 days prior to the test the woman should consume an unrestricted diet (>150 g carbohydrate per day) and maintain unrestricted physical activity. Women need to remain seated and not smoke during the test. (1, 2).

Table 1. Diagnosis of Gestational Diabetes Mellitus with a 100-g or 75-g Oral Glucose Load

Time (h)	100-g Oral Glucose Load	75-g Oral Glucose Load
Fasting	95 mg/dL (5.3 mmol/L)	95 mg/dL (5.3 mmol/L)
1	180 mg/dL (10.0 mmol/L)	180 mg/dL (10.0 mmol/L)
2	155 mg/dL (8.6 mmol/L)	155 mg/dL (8.6 mmol/L)
3	140 mg/dL (7.8 mmol/L)	

Two or more of the venous plasma concentrations must be met or exceeded for a positive diagnosis.
Source: American Diabetes Association (3).

Table 2. Gestational Diabetes Mellitus (GDM) Prevention Initiative from the National Diabetes Education Program

- GDM imparts lifelong risk for diabetes, mostly type 2
- Modest weight loss and physical activity can delay or prevent type 2 diabetes.
- Offspring can lower risk of diabetes by eating healthy foods, being active, and not becoming overweight.

Conservative recommendations to patients include:

- Let health care practitioners know of any history of GDM.
- Get glucose testing at 6 to 12 weeks postpartum, then every 1-2 years.
- Reach pre-pregnancy weight 6 to 12 months postpartum.
- If still overweight, lose at least 5 to 7% of weight slowly, over time, and keep it off.

Adapted from the National Diabetes Education Program (9).

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303 History of Gestational Diabetes

Definition/Cut-Off Value

History of diagnosed gestational diabetes mellitus (GDM).

Presence of condition diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification

Women who have had a pregnancy complicated by GDM are 40-60% more likely to develop diabetes within 15-20 years (1), usually type 2 (2). This risk of subsequent diabetes is greatest in women with GDM who are diagnosed early in the pregnancy, exhibit the highest rates of hyperglycemia during the pregnancy, and are obese.

Approximately 30-50% of the women with a history of GDM will develop GDM in a subsequent pregnancy. Studies have found that the risk factors for subsequent GDM include insulin use in the index pregnancy, obesity, diet composition*, physical inactivity, failure to maintain a healthy BMI and weight gain between pregnancies (2, 3). In addition, if a woman's lipid levels are elevated, a history of GDM is also a risk factor for cardiovascular disorders (3).

There is evidence to suggest that some women with a history of GDM show relative beta-cell dysfunction during and after pregnancy (3). Most women with a history of GDM are insulin resistant. Changes in lifestyle (dietary and physical activity) may improve postpartum insulin sensitivity and could possibly preserve B-cell function to slow the progression to type 2 diabetes (2, 3).

During WIC nutrition education and counseling, obese women with a history of GDM should be encouraged to lose weight before a subsequent pregnancy. Breastfeeding has been shown to lower the blood glucose level and to decrease the incidence of type 2 diabetes in women with a history of GDM (2, 3). Exercise also has a beneficial effect on insulin action by enhancing peripheral tissue glucose uptake (3). Medical Nutrition Therapy (MNT) is an essential component in the care of women with a history of GDM.

Women with a history of GDM but without immediate subsequent postpartum diagnosis of diabetes should be advised to discuss with their medical provider the importance of having a Glucose Tolerance Testing (GTT) at 6 to 12 weeks postpartum (see Clarification, Table 1); to have a pre-pregnancy consultation before the next pregnancy, and to request early glucose screening in the next pregnancy (4). The National Diabetes Education Program (NDEP) is currently promoting a GDM Diabetes Prevention Initiative, targeting both providers and women with a history of GDM (5). Key messages are illustrated in Table 2. (See Clarification).

WIC nutrition services can support and reinforce the MNT and physical activity recommendations that participants receive from the health care providers. In addition, WIC nutritionists can play an important role in providing women with counseling to help manage their weight after delivery. Also, children of women with a history of GDM should be encouraged to establish and maintain healthy dietary and lifestyle behaviors to avoid excess weight gain and reduce their risk for type 2 diabetes (1).

Diet Composition

Carbohydrate is the main nutrient that affects postprandial glucose elevations. During pregnancy complicated with GDM, carbohydrate intake can be manipulated by controlling the total amount of carbohydrate, the distribution of carbohydrate over several meals and snacks, and the type of carbohydrate. These modifications need not affect the total caloric intake level/prescription (6).

Because there is wide inter-individual variability in the glycemic index each women needs to determine, with the guidance of the dietitian, which foods to avoid or use in smaller portions at all meals or during specific times of the day, for the duration of her pregnancy. Practice guidelines have avoided labeling foods as “good” or “bad” (6).

Meal plans should be culturally appropriate and individualized to take into account the patient’s body habitus, weight gain and physical activity; and should be modified as needed throughout pregnancy to achieve treatment goals (6).

Clarification

Self-reporting of “History of…” conditions should be treated in the same manner as self-reporting of current conditions requiring a physician’s diagnosis, i.e., the applicant may report to the CPA that s/he was diagnosed by a physician with a given condition at some point in the past. As with current conditions, self-diagnosis of a past condition should never be confused with self-reporting.

Table 1. Reasons for Delayed Postpartum Glucose Testing of Women with Prior Gestational Diabetes Mellitus (GDM)

1. The substantial prevalence of glucose abnormalities detected by 3 months postpartum.

2. Abnormal test results identify women at high risk of developing diabetes over the next 5 to 10 years.

3. Ample clinical trial evidence in women with glucose intolerance that type 2 diabetes can be delayed or prevented by lifestyle interventions or modest and perhaps intermittent drug therapy.

4. Women with prior GDM and impaired glucose tolerance (IGT) have cardiovascular disease (CVD) risk factors. Interventions may reduce subsequent CVD, which is the leading cause of death in both types of diabetes.

5. Identification, treatment, and planning of pregnancy in women developing diabetes after GDM should reduce subsequent early fetal loss and major congenital malformations.

Kitzmiller JL, Dang-Kilduff L, Taslimi MM

Table 2. Gestational Diabetes Mellitus (GDM) Prevention Initiative from the National Diabetes Education Program

- GDM imparts lifelong risk for diabetes, mostly type 2.
- Modest weight loss and physical activity can delay or prevent type 2 diabetes.
- Offspring can lower risk by eating healthy foods, being active, and not becoming overweight.

Conservative recommendations to patients include:

- Let health care practitioners know of any history of GDM.
- Get glucose testing at 6 to 12 weeks postpartum, then every 1-2 years.
- Reach prepregnancy weight 6 to 12 months postpartum.
- If still overweight, lose at least 5 to 7% of weight slowly, over time, and keep it off.

Adapted from the National Diabetes Education Program.

Justification for High Risk

Not applicable

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304 History of Preeclampsia

Definition/Cut-Off Value

History of diagnosed preeclampsia

Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	III, VI, V or VI	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification

Please see risk #345 Hypertension and Prehypertension, for a thorough overview of preeclampsia, including incidence, risk factors, signs and symptoms, prevention, and treatment.

Preeclampsia is defined as hypertension with onset during pregnancy, usually after 20 weeks gestation, and typically with proteinuria (high levels of protein found in urine). For some women, proteinuria does not occur; for these women, preeclampsia is diagnosed as hypertension with thrombocytopenia (low platelet count), impaired liver function, renal insufficiency (poor kidney function), pulmonary edema (excess fluid in the lungs), and/or cerebral or visual disturbances (brain and vision problems) (1). The most common type of hypertensive disorder during pregnancy, preeclampsia occurs in 3.4% of pregnancies in the United States and is associated with one maternal death per 100,000 live births in developed countries (1, 2). Worldwide, it leads to the death of over 60,000 women annually (3).

It is important to note that postpartum preeclampsia can also occur, regardless of whether it was present during pregnancy. It is usually diagnosed within 48 hours of delivery but can occur up to 6 weeks postpartum. Thus, women during this period should monitor for preeclampsia symptoms and contact their healthcare provider immediately if they occur. (1, 4)

Women with a history of preeclampsia are at greater risk for future hypertension (HTN), heart attack, stroke, congestive heart failure, metabolic disease, and postpartum depression; these risks increase with repeated incidence of preeclampsia and with preterm delivery (1, 2, 5, 6). Because women with a history of preeclampsia are at increased risk for HTN and related conditions, implementing lifestyle changes after delivery to help prevent HTN is crucial. Lifestyle measures to reduce the risk of HTN for women who are not pregnant include the following:

• Have blood pressure checked at least yearly or as recommended by one's healthcare provider. For those at risk of HTN, regularly monitoring blood pressure is crucial. Blood pressure levels greater than 180/120 mmHg are extremely dangerous and require immediate medical attention (7).

• Consume a diet consistent with the Dietary Guidelines for Americans or follow the Dietary Approaches to Stop Hypertension (DASH) eating plan. Details regarding the DASH eating plan can be found on the National Heart, Lung, and Blood Institute's website: www.nhlbi.nih.gov/healthtopics/dash-eating-plan.

• Engage in regular physical activity.

• Achieve and maintain a healthy weight.

• Limit alcohol and avoid any use of tobacco, marijuana or illegal substances. (See risk #371 Maternal Smoking and risk #372 Alcohol and Substance Use.)

Currently, there is inconclusive scientific evidence on preventative measures for preeclampsia in future pregnancies. However, when dietary calcium is inadequate, research indicates adequate dietary calcium or supplementation (1.5-2 grams/day) may help prevent preeclampsia (1, 2, 3, 8). Dietary folate and folic acid supplementation during pregnancy has also been associated with lower risk of preeclampsia (6, 9).

Breastfeeding

Women who had preeclampsia face a greater risk of HTN later in life; however, longer breastfeeding duration has been found to reduce this risk. (10, 11). Unfortunately, women who had preeclampsia during pregnancy are more likely to not initiate breastfeeding or to stop breastfeeding earlier than women with normal blood pressure (10, 12). Some potential causes for this include greater incidence of preterm birth, low birth weight, caesarean delivery, exposure to medications not compatible with breastfeeding, and mother/infant separation (12).
Women with history of preeclampsia should be encouraged to breastfeed, unless contraindicated. If postpartum women require antihypertensive medications, medications should be chosen that are compatible with breastfeeding, if possible. It is thus very important for the mother to discuss her breastfeeding status and goals with her healthcare provider to determine the best infant feeding and medication plan.

Implications for WIC Nutrition Services

The WIC Program provides support to participants with a history of preeclampsia by offering nutritious food that are important components of a diet to help prevent HTN. WIC nutrition staff also offer nutrition education, counseling, and referrals. In addition, WIC staff can assist participants by:

Pregnant Women with History of Preeclampsia:

• Encouraging prenatal care as soon as possible and to attend all health care appointments.

• Providing information about the symptoms of preeclampsia (sudden weight gain, swelling of face or hands, upper abdominal pain, difficulty breathing, changes in vision (including seeing spots), severe headache, nausea, and/or vomiting) and of the importance of contacting their healthcare provider immediately if they occur. Also, inform them that preeclampsia can occur postpartum.

• Counseling them on healthy weight gain, prenatal vitamin use, and a nutritious diet, including adequate calcium intake. For women with low calcium intake, refer them to their healthcare provider to discuss whether a calcium supplement is appropriate. Please note that a low-sodium diet and/or weight loss is not recommended as treatment for HTN during pregnancy.

• Encouraging them to discuss individualized physical activity recommendations with their healthcare provider.

• Providing information on avoiding any use of alcohol, tobacco, marijuana or illegal substances, as well as offering substance use referrals. The WIC Substance Use Prevention Manual is available for additional guidance and referral resources (https://wicworks.fns.usda.gov/resources/wicsubstance-use-prevention-guide).

• Referring to local home visiting programs for health monitoring and support, if available.

Postpartum Women with History of Preeclampsia:

• Informing them of the symptoms of postpartum preeclampsia and of the importance of contacting their healthcare provider immediately if they occur.

• Providing breastfeeding promotion and support, unless contraindicated. Encourage women to discuss their breastfeeding status and goals with their healthcare provider, especially if medications are prescribed.

• Encouraging them to attend all health care appointments, including their 4-6 week postpartum visit; to develop a plan for future pregnancies; to discuss health conditions and medication needs with their healthcare provider; and to have their BMI, blood pressure, lipids, and fasting glucose assessed yearly (3).

• Counseling them on achieving and maintaining a healthy weight, physical activity, following a diet consistent with the Dietary Guidelines for Americans or the DASH diet.

• Informing them that history of preeclampsia increases their risk of future HTN, cardiovascular disease, and stroke.

• Providing information on avoiding any use of alcohol, tobacco, marijuana or illegal substances, as well as offering substance use referrals. The WIC Substance Use Prevention Manual is available for additional guidance and referral resources (https://wicworks.fns.usda.gov/resources/wicsubstance-use-prevention-guide).

• Referring them to their provider to discuss whether a calcium or folic acid supplement is appropriate, if intake of these nutrients seems inadequate.

• Referring to local home visiting programs, if available, for health monitoring and support.

Clarification

Self-reporting of “History of…” conditions should be treated in the same manner as self-reporting of current conditions requiring a physician’s diagnosis, i.e., the applicant may report to the CPA that s/he was diagnosed by a physician with a given condition at some point in the past. As with current conditions, self-diagnosis of a past condition should never be confused with self-reporting.

Justification for High Risk

Not Applicable

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311 History of Preterm or Early Term Delivery

Definition/Cut-Off Value

History of preterm and/or early term delivery is defined as follows (1, 2):

- Preterm: Delivery of an infant born <36 6/7 weeks.
- Early Term: Delivery of an infant born >37 0/7 and <38 6/7 weeks.

Category	Pregnancy
Pregnant	Any history of preterm or early term delivery
Breastfeeding/ Not Breastfeeding	Most recent pregnancy

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification

Women with a history of preterm delivery have an increased risk of spontaneous preterm delivery in a subsequent pregnancy compared to women with no history of prior spontaneous preterm delivery (3). Prior spontaneous preterm delivery is highly associated with recurrence in subsequent pregnancies. A history of one previous preterm birth is associated with a recurrent risk of 17-37%; the risk increases with the number of prior preterm births and decreases with the number of term deliveries (4).

Typically, a pregnancy lasts about 40 weeks. Premature or preterm birth, however, is defined as a birth that occurs between 20 and 37 weeks of pregnancy, according to the American College of Obstetricians and Gynecologists (ACOG) (5). In the past, the period from 3 weeks before until 2 weeks after the estimated date of delivery was considered a “term” pregnancy, with the expectation that a baby would have similar health outcomes if they were born any time during this interval. In 2013, ACOG released a committee opinion that the label “term” should be replaced with the designations *early term* (≥37 0/7 weeks and ≤38 6/7 weeks gestation) and *full term* (≥39 0/7 weeks and ≤40 6/7 weeks gestation) to more accurately describe these groups of infants (1).

Preterm Delivery

Prematurity affects about 12% of all live births in the U.S., and about 50% of these preterm births were preceded by preterm labor (6). In 2011, the annual rate of premature births in the United States reached 11.7%, nearly two times the rate in European nations (6). Preterm births also account for approximately 70% of newborn deaths and 36% of infant deaths (5).

Despite advances in neonatal care, preterm birth remains a leading cause of infant death in the United States (7). More infants die from pre-term related problems than any other single cause (6). Preterm birth strains society's healthcare resources due to its long-term effects on the health of the newborn (6).

Premature infants may have physical problems that have nutritional implications, including immature sucking, swallowing and immature digestion and absorption of carbohydrates and lipids (7). Preterm infants are at risk for a number of illnesses/health conditions that range from minor to severe complications depending on the circumstances. (See risk 142 *Preterm or Early Term Delivery* for more details.)

Several factors have been found to increase the risk of preterm delivery. Epidemiologic studies have consistently reported low socioeconomic status, nonwhite race, maternal age of ≤18 years or ≥40 years, and low pre-pregnancy underweight as risk factors (4). Studies suggest even modest restrictions in maternal nutrition around the time of conception can lead to premature births and long-term adverse health effects for offspring (8). Other factors associated with a risk of preterm birth may be identified before pregnancy, at conception, or during pregnancy include (8, 9):

- Low maternal weight gain during pregnancy
- Maternal infections
- Maternal hypertension
- Gestational diabetes
- Smoking
- Indoor pollution
- Maternal stress
- Poor housing quality
- Teen pregnancy
- Sexually transmitted diseases
- Low psychosocial health status
- Previous or present pregnancy complications
- Multiple fetuses
- Lack of perceived social support

A recent study indicated that maternal obesity is also an independent risk factor for preterm delivery (10). Complications associated with obesity (BMI ≥ 30) prior to conception that increase the risk for preterm delivery include (11):

- Gestational Diabetes Mellitus
- Hypertension
- Preeclampsia
- Cesarean Delivery
- Postpartum weight retention

Additional concerns related to obesity include potential intrapartum, operative, and postoperative complications and difficulties related to anesthesia management. Obese women are also less likely to initiate and sustain breastfeeding (11).

Breastfeeding is recommended as the normative standard for infant feeding and nutrition for all infants, especially preterm babies. Breastfeeding preterm infants has been associated with positive health outcomes for these infants, including:

- Improved motor maturity and cognitive ability (12, 13, 14)
- Reduced risk of necrotizing enterocolitis (15, 16)
- Reduced risk of retinopathy of prematurity and retinal detachment (17)

Additionally, mothers of preterm infants produce milk that is designed to meet the baby's particular needs during the first few weeks of breastfeeding. It is higher in protein and minerals, such as salt, and contains different types of fat that the baby will be able to digest and absorb more easily compared to the milk of mothers of full term babies. The fat in human milk also helps to enhance the development of the baby's brain and neurologic tissues, which is especially important for premature infants. Human milk is also easier for babies to digest than formula and avoids exposing the baby's immature intestinal lining to the cow's milk proteins found in premature infant formula. Preterm infants who are breastfed are less likely to develop intestinal infections than babies who are formula fed, and the colostrum produced in the first few days contains high concentrations of antibodies that will also help the baby fight infection. (16)

Breastfeeding preterm infants, especially if they are in the NICU, may present unique challenges for breastfeeding dyads. These mothers will benefit from extra breastfeeding support due to the delay of direct breastfeeding, reliance on breast pumps, and the stress of having a sick newborn. Even if the baby cannot breastfeed directly from the breast at first, the mother can be encouraged to express her milk to ensure that her supply is maintained. Supportive care for infants in the NICU may include the use of a feeding tube. Expressed human milk can be passed through the tube, so it is important for the mother to discuss her feeding decisions with her baby's doctor.

Early Term

Up to 10% of babies in the United States are scheduled for early term deliveries via labor-inducing medication or cesarean section before 39 weeks of gestation despite neither the mother nor the baby being at risk if the pregnancy continues (18). Elective deliveries like this are sometimes requested for reasons such as wanting to schedule the date of the infant's birth, physician preference, or for relief of symptoms at the end of the pregnancy (18).

Research shows that a fetus will experience a significant amount of development and growth of the lungs, brain, and liver between 37 and 39 weeks of gestation. The brain develops at its fastest rate at the end of the pregnancy, at a rate of up to one third between weeks 35 and 39. Additionally, layers of fat are added under the infant's skin during the last few weeks of pregnancy which helps them keep warm after birth.
According to ACOG, non-medically warranted deliveries prior to 39 weeks should be avoided (19). Early term delivery puts an additional strain on society as the early term infant will likely require a

longer hospital stay and may have long term healthcare needs (18). Factors that can increase the risk of a woman delivering an early term infant are the same and are stated above for preterm birth.

When a woman delivers an early term infant or chooses an early elective delivery, she is at increased risk for postpartum depression, cesarean delivery, and other complications requiring longer hospital stays (18). Steps pregnant women can take in order to decrease the prevalence of pre-term births include (18):

- Seek regular prenatal care throughout pregnancy.
- Maintain a healthy diet, including daily prenatal vitamins.
- Cease consumption of alcohol, drugs, or other dangerous toxins during pregnancy.
- Avoid stress.
- Contact their health care provider with all questions or concerns.

Implications for WIC Nutrition Services

Pregnant women who come from low or inadequate income households are at a greater risk for poor physical and mental health due to poor eating habits. WIC services may assist women at risk of preterm and early term births by providing them with proper nutrition.

Early prevention is the primary way to stop preterm labors. WIC can assist in reducing preterm deliveries by increasing prevention strategies. WIC can improve outcomes through:

- Recommending healthy maternal weight gain and providing nutrition education that addresses the WIC food package and other healthy foods that contribute to a balanced diet.
- Promoting early and regular prenatal care.
- Encouraging use of prenatal vitamins, as prescribed by the health care provider.
- Recommending adherence to Dietary Guidelines for Americans.

WIC staff may find the below listed resources helpful in providing nutrition counseling**:**

- *Additional Considerations for Some Adults-Physical Activity for Women During Pregnancy and the Postpartum Period*: http://health.gov/paguidelines/guidelines/chapter7.aspx.
- *Women, Infants, and Children-About WIC, How WIC Helps*: http://www.fns.usda.gov/wic/about- wic-how-wic-helps.
- *WIC Works Resource Systems*: https://wicworks.fns.usda.gov/.

Justification for High Risk

Not Applicable

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321 History of Spontaneous Abortion, Fetal or Neonatal Loss

Definition/Cut-Off Value

A spontaneous abortion (SAB) is the spontaneous termination of a gestation at < 20 weeks gestation or < 500 grams. Fetal death is the spontaneous termination of a gestation at ≥ 20 weeks. Neonatal death is the death of an infant within 0-28 days of life.

Pregnant Women:

Any history of fetal or neonatal loss or two or more spontaneous abortions.

Breastfeeding Women:

Most recent pregnancy in which there was a multifetal gestation with one or more fetal or neonatal deaths but with one or more infants still living.

Not Breastfeeding woman:

Most recent pregnancy

Presence of condition diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant category and priority level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification

Pregnancy:

Previous fetal and neonatal deaths are strongly associated with preterm low birth weight (LBW) and the risk increases as the number of previous poor fetal outcomes goes up.

Spinnillo et al found that the risk for future small for gestational age outcomes increased two-fold if a woman had 2 or more spontaneous abortions. Adverse outcomes related to history of

spontaneous abortion include recurrent spontaneous abortions, low birth weight (including preterm and small for gestational age infants), premature rupture of membranes, neural tube defects and major congenital malformations. Nutrients implicated in human and animal studies include energy, protein, folate, zinc, and vitamin A.

Postpartum women:

A spontaneous abortion has been implicated as an indicator of a possible neural tube defect in a subsequent pregnancy. Women who have just had a spontaneous abortion or a fetal or neonatal death should be counseled to increase their folic acid intake and delay a subsequent pregnancy until nutrient stores can be replenished.

The extent to which nutritional interventions (dietary supplementation and counseling) can decrease the risk for repeat poor pregnancy outcomes, depends upon the relative degree to which poor nutrition was implicated in each woman's previous poor pregnancy outcome. WIC Program clients receive foods and services that are relevant and related to ameliorating adverse pregnancy outcomes. Specifically, WIC food packages include good sources of implicated nutrients. Research confirms that dietary intake of nutrients provided by WIC foods improve indicators of nutrient status and/or fetal survival in humans and/or animals.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Acknowledge participant's loss, and provide sensitive, compassionate counseling
- Explain importance of maintaining health and nutritional status

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331 Pregnancy at a Young Age

Definition/Cut-Off Value

Pregnancy at a young age is defined as conception at ≤ 20 years of age for the following:

Pregnant Women:

Current pregnancy

Breastfeeding/ Not Breastfeeding:

Most recent pregnancy

Last menstrual period (LMP) minus Birth Date is < 16 years – **331a**

LMP minus Birth Date is ≥ 16 and ≤ 20 years (up to the 21st birthday) – **331b**

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Auto Assignment

Pregnant Women:

Auto assigned if LMP minus birth date is ≤ 20 years

Breastfeeding/ Not Breastfeeding:

Auto assigned if LMP minus birth date is ≤ 20 years

High Risk Flag

The high risk designation will automatically activate for pregnant women assigned this risk factor.

Justification

Pregnancy before growth is complete, is a nutritional risk because of the potential for competition for nutrients for the pregnancy needs and the woman's growth.

The pregnant teenager is confronted with many special stresses that are superimposed on the nutritional needs associated with continued growth and maturation.

Younger pregnant women of low socioeconomic status tend to consume less than recommended amounts of protein, iron, and calcium, and are more likely to come into pregnancy already underweight. Pregnant teens who participate in WIC have been shown to have an associated increase in mean birth weight and a decrease in LBW outcomes.

Adolescent mothers frequently come into pregnancy underweight, have extra growth related nutritional needs, and because they often have concerns about weight and body image, are in need of realistic, health promoting nutrition advice and support during lactation. Diets of adolescents with low family incomes typically contain less iron, and less vitamin A than are recommended during lactation.

The adolescent mother is also confronted with many special stresses superimposed on the normal nutritional needs associated with continued growth. Nutrition status and risk during the postpartum period follow from the nutritional stresses of the past pregnancy, and in turn have an impact on nutrition related risks in subsequent pregnancies.

Poor weight gain and low intakes of a variety of nutrients are more common in pregnant adolescents. Therefore, participation in the WIC Program should be of substantial benefit.

Justification for High Risk

Pregnant teens are at risk for poor birth outcomes and can benefit from individualized follow-up, support, and encouragement to meet dietary and weight gain goals.

Infants of teen pregnancies are at a higher risk for abnormalities of the central nervous system, the gastrointestinal system and musculoskeletal anomalies, including cleft lip and missing or extra fingers and toes. A shorter interval between menarche and the first pregnancy leads to an increased risk, leading researchers to suggest that these congenital defects may be from young mothers being biologically immature. Poor outcomes are more prevalent in teen pregnancies when they engage in high risk behaviors such as smoking, illegal drug use, and poor diet. Another possible explanation is the fact that this population has low vitamin supplementation and is more likely to receive late prenatal care (4).

Postnatal adolescent girls have higher weight retention when compared to older postnatal women, even if lean body mass is similar. The extra weight consists mostly of fat mass which increases the teens' risk for obesity later in life (5). Pregnant teens are also twice as likely to develop hypertensive problems and to deliver preterm and LBW babies.

Although there are existing studies that suggest teenage pregnancies are not high risk, an extremely large study comprised of 3.8 million women found that teenage pregnancy does in fact increase the risk of adverse birth outcomes. These risks include pre-term delivery, SGA, LBW, and infant mortality independent of inadequate prenatal care, low socioeconomic status (SES) and poor weight gain during pregnancy. This study specifically found that poor pregnancy outcomes increased as maternal age decreased, where these outcomes were less likely to be attributed to low SES and poor prenatal care.

Additional Counseling Guidelines

- Support weight gain as normal part of pregnancy process
- Explain need for the body to change to support pregnancy
- Explain potential risk of low weight gain:
    - Low birth weight infant
    - Premature infant
- Encourage adequate prenatal care
- Encourage prenatal vitamin supplementation
- Promote overall healthy eating
- Counsel on avoidance of alcohol, drugs, and smoke exposure

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332 Short Interpregnancy Interval

Definition/Cut-Off Value

Short Interpregnancy Interval (IPI), formerly known as *Closely Spaced Pregnancies*, is defined as an interpregnancy interval of less than 18 months from the date of a live birth to the conception of the subsequent pregnancy for the following:

Pregnant Women:

Current pregnancy

Breastfeeding/ Not Breastfeeding:

Most recent pregnancy

Note: The evidence-based information supporting this criterion is specific to live births and did not include women who had miscarriages or stillbirths. Thus, the definition for this criterion is specific only to women who experienced live births. Women whose pregnancies did not result in a live birth may be assigned, as appropriate, Risk #321 *History of Spontaneous Abortions, Fetal or Neonatal Loss*.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	IPI* < 6 months
Breastfeeding	I	N
Not Breastfeeding	VI	N

*IPI refers to interpregnancy interval

Parameters for Auto Assignment

Auto assigned if last pregnancy ended < 18 months before LMP.
(26 months - 9 month pregnancy = 18 month interpregnancy interval)

Note: The 332 risk is based on the presence of two pregnancy records. This risk is assigned when there is less than 18 months between the current pregnancy Last Menstrual Period and the previous pregnancy Actual Delivery Date.

High Risk Flag

Must be manually selected for pregnant women with an IPI < 6 months

Justification

Adverse maternal and infant health outcomes have been associated with short Interpregnancy Intervals (IPIs). While there is no standard definition for short IPI, an IPI less than 18 months has been associated with increased risk for adverse outcomes (1, 2). An interval of 18 to 24 months has been associated with the lowest relative risk (2). Evidence associated with the lowest relative risk for an IPI following a miscarriage or abortion is still unclear (see Clarification Section for more information) therefore only health effects associated with a short IPI following a live birth were reviewed for this criterion.

Historically, the World Health Organization (WHO) and other international authorities had recommended at least 2-3 years between pregnancies and the United States Agency for International Development (USAID) had suggested an interval of 3-5 years. Given the inconsistency, various countries and regional programs requested the WHO to further review the research and provide recommendations. As a result, the report from the 2005 WHO Technical Consultation and Scientific Review of Birth Spacing recommended an interval of at least 24 months after a live birth to reduce the risk of adverse maternal, perinatal, and infant outcomes. (3). A more recent review of data suggests that there are increased risks for adverse perinatal and maternal outcomes with an IPI less than 18 months (1, 2 ,4) and increased risks for perinatal (1, 4) and maternal (4, 5, 6) outcomes longer than 59 months while 18 to 24 months was associated with the lowest relative risk (2). Parallel to recent findings, Healthy People 2020 has proposed a 10% improvement in reducing the proportion of pregnancies conceived within 18 months of a previous birth (7).

Outcomes associated with short IPI have included maternal complications such as uterine rupture in women attempting a vaginal birth after a previous cesarean delivery (also referred to as VBAC) (8, 9); and perinatal and neonatal complications such as preterm birth (1, 2, 10), low birth weight (1, 2), small for gestational age (1, 2), birth defects (11), and autism (12, 13).

Short interpregnancy interval has been identified as a risk for increasing uterine rupture in women attempting a VBAC delivery (8, 9, 14). Yet when comparing short interpregnancy interval to labor type – induced labor and spontaneous, there was a decrease rate in VBAC success in women who were induced, and no difference with spontaneous labor (15). Given the lack of a specific IPI recommendation for women with a previous cesarean delivery and the inconsistencies in study designs there appears to be no specific guidelines for interval length after a cesarean delivery (16). The short interpregnancy interval definition cut- off of 18 months, however, appears to be inclusive of women who delivered by cesarean with their previous pregnancy.

Factors contributing to adverse outcomes and short IPI remain controversial. It was thought that socioeconomic factors contributed to adverse outcomes. However, when controlled for possible cofounders, short IPI remained an independent risk factor (1, 2). Nutrition-related hypothetical causal mechanisms have been proposed to explain the effects short IPIs have on health, yet research remains inconclusive (4). The Maternal Depletion Syndrome hypothesized that mothers who have a short IPI often do not have adequate time to replenish macro- and micro-nutrients which may lead to the mother and fetus competing for nutrients (17). However, a recent systematic review of the literature found no evidence to support this hypothesis (4). Studies to support the

folate depletion theory have had differing results (11, 18). When folate intake is inadequate, concentrations begin to decrease in the fifth month of pregnancy and for several weeks after birth (19). Women who did not take folic acid supplementation during pregnancy, compared to women who did, were at greater risk of fetal growth restriction with a short (less than six months) IPI and, this risk was found to decrease as IPI increased (18). Of interest, a retrospective Canadian study of 46,243 women found an association between IPI (less than six months) and folate-independent anomalies, however not for folate-dependent anomalies such as neural tube defects, cleft lip and palate, and cardiovascular defects (11). In addition, the association between short IPI and anemia was found inconclusive (2).

Justification for High Risk

Women with interpregnancy intervals (IPI) of less than 6 months are at greater risk for early spontaneous preterm birth (<34 weeks) (1). It has also been shown that these women are at much greater risk for delivering a low birth weight or small for gestational age infant when compared to women with an IPI greater than 6 months. While the causality has not yet been determined, it has been suggested that the mother has had inadequate time to replete nutrient stores. The lack of nutritional reserves may not be adequate to support proper fetal growth and development. Lack of folate in particular has been shown to increase risk of growth restriction (2).

Additional Counseling Guidelines

- Explain that closely spaced pregnancies leave less time to replenish nutrient stores; therefore, good nutrition is very important during this pregnancy
- Explain benefits of spacing pregnancies
    - Less risk for preterm birth, low birth weight, and infant mortality
    - More time for mother's body to replenish nutrient stores
    - More time for mom and baby to strengthen their nurturing relationship
    - More time to enjoy breastfeeding
- Encourage early initiation of prenatal vitamin
- Encourage talking to doctor about additional folate supplementation

Implications for WIC Nutrition Service

Findings from a small pilot study found coordination of primary health care and social support services reduced adverse pregnancy outcomes and the average number of pregnancies conceived within 18 months among low-income African-American who previously delivered a very low birth weight baby (20). Results from a 2007 U.S. survey found that among women of childbearing age, those aged 18-24 years were the least aware of the need for folic acid prior to pregnancy and least likely to report daily use of supplements containing folic acid. Of equal concern, only 17% of women aged 18-24 years were likely to hear about folic acid from their healthcare provider. (21)

Initiations of healthcare referrals for family planning, early prenatal care, and folic acid supplementation have the potential to improve health outcomes for women, infants, and

children. Given that half of all pregnancies nationwide are unintended (22), WIC can help to reduce the risk of adverse pregnancy outcomes by:

- Encouraging postpartum women and their partner to meet with their healthcare provider to discuss developing a reproductive plan and birth spacing, as appropriate. http://www.cdc.gov/preconception/documents/rlphealthproviders.pdf
- Encouraging folic acid supplementation. http://www.cdc.gov/features/folicacidbenefits/
- Encouraging healthful eating patterns consistent with the Dietary Guidelines for Americans. http://www.cnpp.usda.gov/DietaryGuidelines

Clarification

Study results for an optimal Interpregnancy Interval (IPI) following a termination or miscarriage have been inconsistent (3, 10, 23, 24). The WHO Technical Consultation on Birth Spacing Report recommended a minimum interval of at least six months between a miscarriage or induced abortion and the next pregnancy. This recommendation was based on a large retrospective cross-sectional study, a review of 258,108 hospital records from several Latin American countries between 1985-2002, that found women whose previous pregnancy resulted in a spontaneous or induced abortion and had an IPI shorter than 6 months had an increased risk for adverse maternal and perinatal outcomes (21). Given several limitations in the study the WHO cautioned against generalizing the results to other regions or even within the Latin American region since service operations and conditions may differ from the study sample (3). However, more recently a review of approximately a million California births found a decreased risk for preterm birth for women with an IPI of less than six months after a terminated pregnancy (10). An overview of the research found that there may be little benefit from delaying pregnancy after an uncomplicated miscarriage, and to that end pregnancy spacing recommendations following a miscarriage should be individually tailored to the person. (25)

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334 Lack of Prenatal Care

Definition/Cut-Off Value

Prenatal care beginning after the 1st trimester (after 13th week) of pregnancy or based on an Inadequate Prenatal Care Index published in a peer reviewed article such as the one by Kessner et al. (4).

Weeks Gestation	Inadequate # of Prenatal Visits
14-21	0 or unknown
22-29	1 or less
30-31	2 or less
32-33	3 or less
34 or more	4 or less

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y

Parameters for Auto Assignment

Auto assigned if Nutrition Interview states prenatal care began after the 13th week of pregnancy.

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned for pregnant women.

Justification

Women who do not receive early and adequate prenatal care are more likely to deliver premature, growth retarded, or low birth weight infants (2). Women with medical or obstetric problems, as well as younger adolescents, may need closer management; the frequency of prenatal visits should be determined by the severity of identified problems (1). Several studies have reported significant health and nutrition benefits for pregnant women enrolled in the WIC Program (2).

Justification for High Risk

The scientific literature indicates that prenatal care initiated in the third trimester has been associated with increased risk of:

- Neonatal death
- Stillborn infant

- Prematurity
- Low birth weight

Prenatal care is a primary component of preventive care for pregnant women. Early and regular prenatal care provides an opportunity for maternal and fetal screening, diagnosis, and treatment of complications. Women who reported not receiving all recommended advice (i.e., breastfeeding, taking vitamins, eating a proper diet, avoiding alcohol, tobacco, and drugs, maintaining proper weight gain) were more likely to deliver a low birth weight infant than women who reported receiving this advice (1). Lack of prenatal care has also been associated with birth of a small for gestational age (SGA) infant (3).

Studies have also shown that most women who do not receive early and adequate prenatal care are often in a demographic category that is already at risk for poor pregnancy outcomes (4).

Additional Counseling Guidelines

- Explain importance of receiving early and adequate prenatal care

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335 Multifetal Gestation

Definition/Cut-Off Value

More than one (>1) fetus in a current pregnancy (Pregnant Women) or the most recent pregnancy (Breastfeeding and Not Breastfeeding Women).

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	Y
Not Breastfeeding	VI	N

Parameters for Auto Assignment

Auto assigned if “Multifetal Gestation” is marked on the pregnancy panel.

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned for pregnant and breastfeeding women.

Justification

Multifetal gestations are associated with low birth weight, fetal growth restriction, placental and cord abnormalities, preeclampsia, anemia, shorter gestation and an increased risk of infant mortality. Twin births account for 16% of all low birth weight infants. The risk of pregnancy complications is greater in women carrying twins and increases markedly as the number of fetuses increases (1,2).

For twin gestations, the 2009 IOM recommendations provide provisional guidelines: normal weight women should gain 37-54 pounds; overweight women, 31-50 pounds; and obese women, 25-42 pounds (3). There was insufficient information for the IOM committee to develop even provisional guidelines for underweight women with multiple fetuses. A consistent rate of weight gain is advisable. A gain of 1.5 pounds per week during the second and third trimesters has been associated with a reduced risk of preterm and low-birth weight delivery in twin pregnancy (2). In triplet pregnancies the overall gain should be around 50 pounds with a steady rate of gain of approximately 1.5 pounds per week throughout the pregnancy (2). Education by the WIC nutritionist should address a steady rate of weight gain that is higher than for singleton pregnancies.

Pregnant or breastfeeding women with twins have greater requirements for all nutrients than women with only one infant. Postpartum, Not Breastfeeding women delivering twins are at greater nutritional risk than similar women delivering only one infant. All three groups of women would benefit greatly from the nutritional supplementation provided by the WIC Program.

Justification for High Risk

Multiple fetal gestations are associated with low birth weight, fetal growth restriction, placental and cord abnormalities, preeclampsia, anemia, shorter gestation, and increased risk of infant mortality. Multifetal gestations are at greater risk for having a shortened pregnancy which increases risk of preterm delivery and risk for infants developing neurological abnormalities. Complications are not only restricted to gestation, as these infants typically have poor neonatal outcomes and a prolonged hospital stay.

These mothers also have greater risk for intrauterine growth restriction and developing gestational diabetes contributed to by the mother's nutritional status and higher levels of hormones. Cesarean deliveries, prolonged hospital stay and early hospital admissions are more common for mothers of multiple births. Other adverse outcomes include miscarriage, premature rupture of membranes and polyhydramnios. Triplets and quadruplet pregnancies specifically have a greater risk for mothers to experience pre-eclampsia, anemia, and postpartum hemorrhage. Mortality is also increased in multifetal gestations not only for infants but also for mothers. Maternal mortality is three times greater in multiple pregnancies than a singleton pregnancy.

A woman meeting this risk criterion can benefit from assessment of her weight gain and individual nutrition counseling through WIC.

Additional Counseling Guidelines

Pregnant participants:

- For twin gestations, the recommended range of maternal weight gain is 37-54 pounds with a gain of 1.5 pounds per week during the second and third trimesters
    - Underweight women should gain at the higher end of the range and overweight women should gain at the lower end of the range
    - Four to six pounds should be gained in the first trimester
- In triplet pregnancies, the overall gain should be around 50 pounds with a steady rate of gain of approximately 1.5 pounds per week throughout pregnancy.
- Generally accepted dietary recommendations include:
    - Increased needs for calories, protein, iron, calcium, folate, vitamin B6, and zinc (table of food guidelines to follow)
    - A need for increased weight gain (table of guidelines follow) during pregnancy, especially for those women who are of low or normal pre-pregnancy weight
- Encourage early weight gain due to reduced stomach capacity as pregnancy progresses
- Encourage small, frequent energy-dense meals every 2-3 hours at first, then every hour or two as the pregnancy proceeds

  - A liberal fat intake (40% calories) may be needed due to volume restrictions
- Encourage an extra serving of milk for each fetus to meet calcium needs
- Recommend iron supplements beginning in the second trimester
- Recommend limiting caffeinated beverages to 3 servings/day

The Daily Food Guide listed below represents the minimum number of servings recommended for a singleton pregnancy. However, for women pregnant with multiples 300 calories more a day, compared to women pregnant with one baby, are needed. Women pregnant with multiples should discuss the number of extra calories they should eat with their health care providers.

Reference: "Multiples: Twins, Triplets, and Beyond," March of Dimes Website

Daily Food Guide	Provides:	Servings
Meat	protein, iron, zinc, B vitamins	2
Milk Products	protein, calcium	2
Grains & Cereals (select whole grains whenever possible)	carbohydrates, B vitamins, iron	6
Fruit	vitamins A & C	2-4
Vegetables	vitamins A & C	3-5

- Each of the "Healthy Choices" listed below has about 300 calories
  - 1 slice of bread with 2 tablespoons of peanut butter
  - 3 oz. of meat with ½ cup of sweet potatoes
  - 1 flour tortilla with ½ cup of refried beans, ½ cup of cooked broccoli and ½ cup of cooked red peppers

Breastfeeding participants:

- Assess:
  - Dietary adequacy of mother
  - Growth of infants (including test weighing)
- Reassure mother that she can provide adequate milk
- Encourage simultaneous breastfeeding to increase prolactin levels
  - Teach positions for simultaneous breastfeeding (double clutch, parallel, double cradle)
- Verify proper latch-on and positioning
- Could refer to support group for multiples

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336 Fetal Growth Restriction

Definition/Cut-Off Value

Fetal Growth Restriction (FGR) replaces the term Intrauterine Growth Retardation (IUGR), may be diagnosed by a physician with serial measurements of fundal height, abdominal girth and can be confirmed with ultrasonography. FGR is usually defined as a fetal weight < 10th percentile for gestational age.

Presence of condition diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

High Risk Flag

High risk designation will automatically activate when this risk factor is assigned

Justification

Fetal Growth Restriction (FGR) usually leads to low birth weight (LBW), which is the strongest possible indicator of perinatal mortality risk. Severely growth restricted infants are at increased risk of fetal and neonatal death, hypoglycemia, polycythemia, cerebral palsy, anemia, bone disease, birth asphyxia, and long-term neurocognitive complications. FGR may also lead to increased risk of ischemic heart disease, hypertension, obstructive lung disease, diabetes mellitus, and death from cardiovascular disease in adulthood. FGR may be caused by conditions affecting the fetus such as infections and chromosomal and congenital anomalies. Restricted growth is also associated with maternal height, pre-pregnancy weight, birth interval, and maternal smoking. WIC's emphasis on preventive strategies to combat smoking, improve nutrition, and increase birth interval, may provide the guidance needed to improve fetal growth.

Justification for High Risk

Fetal Growth Restriction (FGR) usually leads to low birth weight which is the strongest possible indicator for prenatal mortality risk. Severely growth restricted infants are at increased risk of: fetal

and neonatal death, hypoglycemia, polycythemia, SGA, cerebral palsy, anemia, bone disease, birth asphyxia, and long-term neurocognitive delays.

Some maternal risk factors which contribute to FGR include lupus, cardiac disease, high blood pressure, diabetes with vascular disease, smoking, use of illegal drugs, malnutrition, low socioeconomic status, history of FGR, and extreme ages. Pregnant mothers who have been diagnosed with FGR have a greater risk of developing pre-eclampsia later in the pregnancy. Low birth weight caused by FGR is associated with renal and cardiovascular disease in the infant's adult life. Additionally, a recent study found that FGR increases rates of stillbirths and perinatal mortality.

Although few causes of FGR can be prevented, there are some interventions that have proven effective in prevention. This would include addressing and changing modifiable risk factors such as smoking cessation, eating a balanced diet with protein supplementation (especially pregnant teens), avoiding alcohol and uncooked meat, and reducing contact with animals. Mothers who quit smoking before 16 weeks gestation are no longer at risk for FGR.

Early detection of FGR is related to a reduction in infant morbidity and mortality rates. WIC services can benefit these mothers and assist them in addressing the modifiable risk factors.

Additional Counseling Guidelines

- Assess nutritional status with emphasis on well-balanced intake
- Assess and promote healthy weight gain
    - food supplementation during pregnancy to improve weight gain reduces the risk of FGR

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337 History of Birth of a Large for Gestational Age Infant

Definition/Cut-Off Value

Pregnant Women:

Any history of giving birth to an infant weighing ≥ 9 pounds (4000 grams)

Breastfeeding/Not Breastfeeding Women:

Most recent pregnancy, or history of giving birth to an infant weighing ≥ 9 lbs. (4000 grams)

Presence of condition diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Auto Assignment

Auto assigned for breastfeeding and Not Breastfeeding woman if associated infant is marked as LGA on Anthropometric screen.

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel for pregnant women

Justification

Women with a previous delivery of an infant weighing > 9 lbs. (4000 grams) are at an increased risk of giving birth to a large for gestational age infant (1). Macrosomia may be an indicator of maternal diabetes (current or gestational) or a predictor of future diabetes (2).

The incidence of maternal, fetal, and neonatal complications is high with neonates weighing > 9 lbs. (4000 grams). Risks for the infant include dystocia, meconium aspiration, clavicular fracture, brachia plexus injury, and asphyxia (3).

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Maternal obesity, high pre-pregnancy weight, and large gestational weight gain contribute significantly to LGA
- Counsel on recommended weight gain based on pre-pregnancy BMI
- Review weight gain pattern from previous pregnancies
- If woman is diabetic see NRF #302 for counseling tips

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338 Pregnant Woman Currently Breastfeeding

Definition/Cut-Off Value

Pregnant woman who is currently breastfeeding.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Generally, it is considered safe for most women to continue breastfeeding while pregnant and can be sustained for as long as mutually desired by the mother and child (1). The assignment of this risk is not intended to discourage women from continuing breastfeeding during pregnancy, but rather to highlight the need to review the mother's medical history and diet along with her breastfeeding goals.

Incidence rates of breastfeeding while pregnant among U.S. mothers have not been reported recently. The National Health and Nutrition Examination Survey (NHANES) III indicated that between 1988 and 1994 only 5% of North American breastfeeding women were pregnant (2).

Research on breastfeeding during pregnancy, especially among U.S. populations, is very limited; however, some studies have examined the relationship that this practice has on birth outcomes, such as preterm delivery, miscarriage, and birth weight. During breastfeeding, stimulation of the nipples causes the secretion of the hormone oxytocin, which can result in contractions of the uterus (3). It has been suggested that these contractions may induce labor and therefore increase the risk of delivering prematurely in some women; however, this is not a concern for the typical low risk pregnancy (1, 4, 5). In a small retrospective study of 57 U.S. mothers with an unknown previous pregnancy outcome, most did not notice any uterine contractions specific to breastfeeding. The women that did notice uterine contractions specific to breastfeeding gave birth to healthy babies (6).

Studies of pregnancy-breastfeeding overlap among women with a history of preterm delivery or miscarriage are presently lacking in the scientific literature. As a result, these women should be encouraged to talk with their health care provider about their breastfeeding goals and report any uterine contractions (1). For more information on premature delivery, see risk #142 Preterm or Early Term Delivery or risk #311 History of Preterm or Early Term Delivery.

Several studies of pregnancy-breastfeeding overlap have been conducted with women without a history of preterm labor or miscarriage, and no statistically significant increased risk of premature delivery were reported (7, 8). One retrospective study compared the outcomes of pregnancies in mothers with no history of premature delivery or miscarriage that had one full-term infant and continued breastfeeding during pregnancy to a control group of comparable age and pregnancy history that stopped breastfeeding at least three months before becoming pregnant. Fewer pregnancies (7.3%) in the breastfeeding group resulted in spontaneous abortion than the control group (8.4%) (7). In a systematic review of all of the relevant literature published between 1990 and 2015, none of the studies reviewed reported significant differences in the numbers of premature births between pregnant mothers who breastfed and Not Breastfeeding pregnant mothers, even when breastfeeding duration, the number of feedings, or birth interval were controlled for (9). These results provide evidence for continued support of breastfeeding during pregnancy for mothers with no previous history of preterm labor or miscarriage.

Several studies have also examined the effect of breastfeeding during pregnancy on the birth weight of the infant. These studies reported similar mean birth weights between infants born to mothers who breastfed during pregnancy and those who did not. (5, 8, 10, 11)

When a woman is pregnant or breastfeeding, she has a higher need for certain vitamins and minerals and may have greater caloric needs as well. The same is true for a woman who is pregnant while breastfeeding. It is important to note that caloric needs must be individualized based on current weight, physical activity, and recommended maternal weight gain for weight status (i.e., underweight, normal weight, overweight, or obese). For more information about maternal weight gain, see risk #131 Low Maternal Weight Gain or risk #133 High Maternal Weight Gain.

Justification for High Risk

Not Applicable

Implications for WIC Nutrition Services

WIC staff can support pregnant women who are breastfeeding by:

• Considering personal feelings about breastfeeding while pregnant as well as personal breastfeeding goals with the currently breastfed child.

• Referring mothers who have a history of premature labor or miscarriage and those who are concerned about uterine contractions to their health care providers.

• Providing nutrition education that supports an overall healthy diet, including:

  o Limiting calories from added sugars and saturated fats.

  o Choosing a variety of fruits and vegetables, whole grains, and fat-free or low-fat dairy products.

  - o Eating protein-rich foods such as poultry, fish, beans, eggs, nuts, and lean meats. Pregnant women, including those who are breastfeeding, should avoid eating shark, swordfish, king mackerel, or tilefish due to concern for high levels of mercury. White (albacore) tuna should be limited to no more than 6 ounces per week (12).

- Drinking plenty of fluids. During breastfeeding, fluid needs may increase, and mothers may notice that they are thirstier than usual. Women should drink enough water and other fluids to quench their thirst. A common suggestion is to drink a glass of water with every breastfeeding session (13).

- Monitoring weight status throughout the pregnancy to ensure appropriate weight gain.

- Providing tips for reducing nipple soreness or breast tenderness if women report these concerns. Hormonal changes during pregnancy lead to nipple soreness and breast tenderness in some women (3).

• Informing women that the older child that is breastfeeding may notice some changes in the human milk and wean on his/her own. Although human milk continues to be nutritionally sound throughout pregnancy, the composition of it may change, which might change the way the milk tastes. For some women, their milk production may also decrease as their pregnancy progresses. These factors can lead the breastfeeding child to wean on his/her own before the baby is born. (1)

• Issuing Food Package VII to the mother until her older infant turns one, as long as she is partially (mostly) breastfeeding.

• Providing anticipatory guidance on tandem nursing, which is the practice of breastfeeding two or more children of different ages at the same time. This may ease the older child's adjustment to the new baby, address the mother's own desire to maintain closeness with the older child, and even make childcare easier in some cases as both children are fed and comforted on the breast. This may also allow the mother and children to fulfill the American Academy of Pediatrics' recommendation to continue breastfeeding for as long as mutually desired by the mother and child (14).

Additional Counseling Guidelines

- Ensure that WIC's advice is consistent with MD's recommendations
- Encourage adequate rest.
- Monitor stress level
- Other important considerations include:
  - The age of the nursing child
  - The natural decrease in milk supply that occurs during pregnancy (usually in the last 4 months) could compromise the infant's nutritional needs, if the baby is less than a year old
  - Suggest that mother keep track of the baby's weight gain and offer supplemental feedings if they are needed
  - The child's need to nurse (physically and emotionally)
  - Some babies wean on their own during pregnancy

    - Other babies who weaned during pregnancy may want to breastfeed again once the new baby is born
    - Whether the mother is experiencing any breastfeeding related discomforts (such as sore nipples caused by hormonal changes) and the degree of her discomfort
    - The mother's past nursing experience(s)
    - Health concerns related to the pregnancy (which may be medical reasons to consider weaning)
        - Uterine pain or bleeding while breastfeeding (uterine contractions stimulated by breastfeeding usually pose no danger to the unborn baby and do not increase the risk of premature delivery, but refer participant to physician immediately)
        - History of premature birth
        - Continued loss of weight by mother during pregnancy
- Hormones of pregnancy will not be harmful to breastfeeding infant or toddler
- During last few months of pregnancy milk changes to colostrum in preparation for birth
- Nursing child cannot "use up" the colostrum -- no matter how much he nurses; the colostrum will still be available at birth for the newborn
- If mother chooses to nurse both after baby's birth ("tandem nursing"), follow-up with Dietitian/Lactation Educator is appropriate
- Remember that newborn is priority of the two children

Listen to the mother's feelings, as it is an individual decision whether or not to continue breastfeeding through a pregnancy (and after)

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339 History of Birth with Nutrition Related Congenital or Birth Defect

Definition/Cut-Off Value

Pregnant Women:

Any history of giving birth to an infant who has a congenital or birth defect linked to inappropriate nutritional intake, e.g., inadequate zin, folic acid, excess vitamin A.

Breastfeeding/Not Breastfeeding woman:

Most recent pregnancy, or history of giving birth to an infant who has a congenital or birth defect linked to inappropriate nutritional intake, e.g., inadequate zin, folic acid, excess vitamin A.

Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel for pregnant women

Justification

The single greatest risk factor for a pregnancy with a neural tube defect is a personal or family history of such a defect. More than 50% of recurrences can be prevented by taking folic acid before conception. Recent studies suggest that intake of folic acid may also be inversely related to the occurrence of cleft lip and palate. The WIC Program provides nutrition education and folic acid-rich foods to women to help prevent future birth defects.

Recurrent birth defects can also be linked to other inappropriate nutritional intake prior to conception or during pregnancy, such as inadequate zinc (LBW) or excess vitamin A (cleft palate or lip). The food package and nutrition education provided to WIC participants help women at risk make food choices that provide appropriate nutrient levels.

Justification for High Risk

Not Applicable

Clarification

Self-reporting of “History of …” conditions should be treated in the same manner as self-reporting of current conditions requiring a physician’s diagnosis, i.e., the applicant may report to the CPA that s/he was diagnosed by a physician with a given condition at some point in the past. As with current conditions, self-diagnosis of a past condition should never be confused with self-reporting.

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341 Nutrient Deficiency or Disease

Definition/Cut-Off Value

- Any currently treated or untreated nutrient deficiency or disease. These include, but are not limited to, Protein Energy Malnutrition, Scurvy, Rickets, Beriberi, Hypocalcemia, Osteomalacia, Vitamin K Deficiency, Pellagra, Xerophthalmia, and Iron Deficiency.
- Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	Y
Not Breastfeeding	VI	Y
Infants	I	Y
Children	III	Y

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

Nutrient deficiencies or diseases can be the result of poor nutritional intake, chronic health conditions, acute health conditions, medications, altered nutrient metabolism, or a combination of these factors, and can impact the levels of both macronutrients and micronutrients in the body. They can lead to alterations in energy metabolism, immune function, cognitive function, bone formation, and/or muscle function, as well as growth and development if the deficiency is present during fetal development and early childhood.

The Centers for Disease Control and Prevention (CDC) estimates that less than 10% of the United States population has nutrient deficiencies; however, nutrient deficiencies vary

by age, gender, and/or race and ethnicity (1). For certain segments of the population, nutrient deficiencies may be as high as one third of the population (1).

Intake patterns of individuals can lead to nutrient inadequacy or nutrient deficiencies among the general population. Intakes of nutrients that are routinely below the Dietary Reference Intakes (DRI) can lead to a decrease in how much of the nutrient is stored in the body and how much is available for biological functions. DRIs are based on age and sex and include Recommended Dietary Allowance (RDA), Adequate Intake (AI), Estimated Average Requirement (EAR) and Tolerable Upper Intake Level (UL). DRIs are established by the National Academies of Science, Engineering and Medicine and include the following definitions:

- RDA - Indicates the average daily intake of particular nutrients to meet the requirements of 97- 98% of healthy people.
- AI - Established to assume adequate intake when there is insufficient evidence to develop an RDA.
- EAR - The average daily intake of a nutrient that is thought to meet the needs of 50% of healthy individuals. EARs are used to assess the adequacy of nutrient intakes among populations rather than the individual.
- UL - The highest nutrient intake that is considered to be safe and does not lead to adverse health effects in the general population (2).

Macronutrient deficiencies include deficiencies in protein, fat, and/or calories, and can lead to stunting, pronounced wasting (marasmus) or a disproportionately large abdomen (a sign of kwashiorkor). Marasmus is a disease of severe wasting due to a prolonged inadequate intake of protein, carbohydrate, and fat. Kwashiorkor is a disease that results from a prolonged inadequate intake of protein. Essential fatty acid deficiencies, which would include omega-3 fatty acid deficiency, are thought to be rare among the general population (3, 4). Signs of an essential fatty acid deficiency may include a dry scaly rash, decreased growth in infants and children, lowered immune response, and impaired wound healing (3).

Micronutrient deficiencies would include deficiencies in vitamins and minerals in the body. According to National Health and Nutrition Examination Survey (NHANES) data, the most common nutrient deficiencies from 2003-2006 in the general United States population were vitamin B6, iron, vitamin D, vitamin C, and vitamin B12 (1). Because NHANES does not assess the status of all vitamins and minerals, there may be other micronutrient deficiencies that are present in the population without an estimated prevalence.

According to NHANES data from 2005-2012, a significant proportion of women who participate in WIC have inadequate nutrient intakes of vitamin E (96-100%). Additionally, greater than 50% of pregnant women participants reported inadequate intakes of iron and between 10-50% reported inadequate intakes of magnesium, folate, zinc, vitamin A, vitamin C, and vitamin B6 (5). Micronutrient deficiencies during pregnancy are not only a concern for the mother, but are of great concern to the developing fetus that is at risk of certain birth defects related to inadequate levels of certain nutrients including B vitamins, vitamin K, magnesium, copper, and zinc (6). Iodine deficiency during pregnancy can lead to irreversible adverse effects on fetal growth and development. Iodine deficiency is the leading cause of intellectual disability worldwide. According to NHANES data from 2005-2008, 56.9% of the pregnant women surveyed had urinary iodine

concentrations below the established threshold of 150mcg/L. This finding suggests that greater than half of pregnant women have insufficient intakes of iodine (7). Because intake patterns of pregnant women can exclude or limit specific food groups, it is not uncommon to have multiple nutrient deficiencies during pregnancy (8). For example, iron deficiency usually does not occur alone, but it often occurs in conjunction with other vitamin and mineral deficiencies (9).

Intakes of nutrients were also found to be low among postpartum and breastfeeding women participating in WIC. Among women who were breastfeeding and participating in WIC, more than 50% had inadequate intakes of vitamin A, and 10-50% had inadequate intakes of magnesium, zinc, vitamin C, vitamin B6, folate, copper, and calcium (5). Greater than 50% of postpartum women who were not breastfeeding were found to have inadequate intakes of magnesium, vitamin A, and calcium, while 10-50% had inadequate intakes of vitamin C, folate, copper, zinc, thiamin, vitamin B6, vitamin B12, iron, and riboflavin (5).

According to NHANES data from 2011-2012, formula fed infants had an average usual intake of choline that was below the AI for that nutrient; however, intakes of other vitamins and minerals were estimated to be adequate (5). Intakes of vitamin D, iron, and zinc among breastfed infants can be of concern if appropriate and timely complementary foods and/or vitamin and mineral supplements are not provided to the infant. According to NHANES data from 2009-2012, at least 10% of infants receiving human milk between 6 and 12 months of age had inadequate intakes of iron and zinc (5). Concentrations of vitamin D in human milk have been found to be low. Therefore, it has been recommended by the American Academy of Pediatrics (AAP) to provide all infants who are taking less than 32 ounces of formula a day a vitamin D supplement of 400 IU daily (10, 11). Additionally, infants who are born to mothers who are vitamin D deficient are more likely to be deficient themselves. (For more information see risk 411 *Inappropriate Nutrition Practices for Infants*.)

For children participating in the WIC program, the prevalence of inadequate intakes of nutrients was found to be less than 5% for each nutrient, except vitamin E, which was found to be inadequate in the diets of 34.9% of children between 2 and 5 years of age (5). Additionally, it has been estimated that one in four children does not meet the RDA for iron, and one in ten does not meet the RDA for calcium (12).

In addition to health risks associated with low nutrient status, some micronutrients pose a health risk at levels higher than the established UL. For this reason, individuals with nutrient deficiency diseases, or who are concerned that they may have a nutrient deficiency disease, should be followed by their medical provider (especially if supplements are required for treatment).

Populations who may be at greater risk of nutrient deficiencies or diseases include:

- Individuals who have intakes below the established RDA, AI, or EAR for the nutrient.
- Individuals who experience food insecurity.
- Individuals who are experiencing homelessness.
- Women who have a short interpregnancy interval.
- Individuals who have recently left their previous country of residence.

- People with a gastrointestinal disease that can limit absorption of nutrients (i.e. celiac disease or Crohn's disease) or individuals with a history of gastrointestinal surgery (including gastric bypass). For example, individuals who have had a portion of their stomach removed or their distal ileum removed during a weight-loss or other surgery are at a greater risk of developing a vitamin B12 deficiency (13).
- Individuals with other medical conditions that influence nutrient status (i.e. cystic fibrosis, renal disease, genetic disorders).
- Individuals on medications that are known to interact with the absorption or excretion of certain vitamins and minerals.
- People with substance use disorders (including alcohol) may be more likely to have deficiencies due to poor intake and/or the effects of the substance. People who have high intakes of alcohol are at greater risk of developing a magnesium deficiency (14, 15).
- People who smoke are more likely to have a vitamin C deficiency due to the increase in oxidative stress.

Nutrient deficiencies or diseases can be subclinical or clinical. Subclinical deficiencies involve changes to the concentrations of the micronutrient in the blood or tissues. Clinical deficiencies involve noticeable changes to the appearance of skin, nails, hair, oral cavity, and bone formation as well as major disturbances in the function of cells and tissues in the body. At either stage of a nutrient deficiency, blood work is often taken to confirm a deficiency. Blood work to detect nutrient deficiencies can be misleading, as some nutrients, such as magnesium, may have an overall deficiency in the body but be at a normal level in the blood (15). Other methods can be used to assess for nutrient deficiency disease, such as a physical nutrition assessment. Because it can be difficult to be tested for, and diagnosed with, a nutrient deficiency or a nutrient deficiency disease can go undetected and untreated.

The table below provides information regarding specific nutrients that are more commonly of concern among the WIC population; however, additional nutrient deficiency diseases may occur in the population. Detailed fact sheets about each nutrient can be found at the National Institutes of Health Office of Dietary Supplements website: https://ods.od.nih.gov/factsheets/list-all/.

Nutrient	Function	Signs and Symptoms of Deficiency
Vitamin A	Involved in immune function, vision, cell growth and cell communication.	Night blindness and xerophthalmia (16).
Vitamin B6	Involved in greater than 100 enzyme reactions in the body and involved in protein metabolism.	Microcytic anemia, scaling of the lips and cracks in the corners of the mouth, swollen tongue, depression, and confusion (17).
Vitamin B12	Involved in red blood cell formation, neurological function, and DNA synthesis.	Megaloblastic anemia, fatigue, weakness, constipation, loss of appetite, and weight loss (13).

Vitamin C	Involved in the formation of collagen, certain neurotransmitters, and protein synthesis.	Development of scurvy which would include: fatigue, inflammation of the gums, and weakened connective tissue (14).
Vitamin D	Promotes calcium absorption and proper bone formation, involved in cell growth, immune function, and reduces inflammation.	Development of rickets in children or osteomalacia in adults, and fatigue (18).
Calcium	Involved in muscle function, nerve transmission, and proper bone formation.	Development of osteoporosis (19).
Folate	Involved in the synthesis of RNA and DNA and is required for cell division and the prevention of Neural Tube Defects.	Megaloblastic anemia (20).
Iodine	A component of thyroid hormones that regulate protein synthesis, metabolism, and enzyme activity.	Stunted growth and neurodevelopmental deficits (7).
Iron	A component of hemoglobin and therefore important in the transfer of oxygen from the lungs to organs and involved in the synthesis of hormones as well as normal growth and development.	Microcytic, hypochromic anemia; impaired cognitive function, poor body temperature regulation, depressed immune function, and spoon like shape of nails (9).
Magnesium	Involved in more than 300 enzyme reactions, protein synthesis, muscle function, nerve function, blood sugar control, and blood pressure control.	Loss of appetite, fatigue, weakness, nausea, vomiting, numbness, tingling, muscle cramps, seizures, personality changes, and abnormal heart rhythms (15).
Zinc	Involved in cell metabolism, enzyme activity, immune function, protein synthesis, wound healing, DNA synthesis, and cell division.	Stunted growth, depressed immune function, hair loss, eye and skin lesions, delayed wound healing, and taste alterations (21).

Implications for WIC Nutrition Services

The WIC food package is designed to include foods that contain specific nutrients to improve the health status of program participants, address inadequate intakes, and, ultimately, prevent nutrient deficiencies. Nutrition education combined with the WIC food package can help decrease the likelihood that an individual would develop a nutrient deficiency or disease. For individuals who currently have a nutrient deficiency or disease, WIC staff can:

- Encourage improved intake of whole grains, legumes, dairy, lean protein, fruits, and vegetables.

- Emphasize appropriate portion size and variety to avoid nutrient to nutrient interaction. (For example, excessive calcium intake inhibits the absorption of iron.)
- Provide education on foods that contain the specific nutrient(s) of concern.
- Provide education on preparing foods that are part of the WIC food package.
- Refer individuals who report food insecurity to appropriate resources in the community like the Supplemental Nutrition Assistance Program (SNAP) and/or food pantries.
- Reinforce the medical and dietary treatment plans provided by the medical provider and refer participants to medical providers for medical follow-up care.
- Refer individuals who smoke to tobacco cessation programs.

Justification for high risk

Persistent malnutrition may lead to elevated morbidity and mortality rates. Important functional disturbances may occur as a result of a single or multiple nutrient deficiencies including: impaired cognitive function, impaired function of the immune system, and impaired function of skeletal muscle. Participants who meet these criteria are extremely high risk and need counseling which addresses their individual needs.

Nutrient deficiencies are not caused by one single factor, but rather by a combination of causes including food fads, medications, poverty, medical illnesses, gastrointestinal disorders such as Celiac or Crohn's disease, and psychiatric illnesses including autism, alcoholism or eating disorders. WIC provides nutritional guidance that can prevent or treat malnutrition in both women and children.

Additional Counseling Guidelines

- Review WIC foods high in nutrient(s) individual to participant's nutrient deficiency
    - Discuss ways in which to incorporate WIC foods into diet
- Explain potential risks particular to participant's nutritional disease
    - Provide basic nutrition counseling appropriate for specific nutritional diseases

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

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342 Gastro-Intestinal Disorders

Definition/Cut-Off Value

Diseases and/or or conditions that interfere with the intake, digestion, and/or absorption of nutrients.

The diseases and/or conditions include, but are not limited to:

- Gastroesophageal reflux disease (GERD)
- Peptic ulcer
- Post-bariatric surgery
- Short bowel syndrome
- Inflammatory bowel disease, including ulcerative colitis or Crohn's disease
- Liver disease
- Pancreatitis
- Biliary tract diseases

Presence of gastro-intestinal disorders diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding woman	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Gastrointestinal disorders increase nutrition risk through a number of ways, including restricted food intake, abnormal deglutition, impaired digestion of food in the intestinal lumen, generalized or specific nutrient malabsorption, or excessive gastrointestinal losses of endogenous fluids and nutrients. Frequent loss of nutrients through vomiting, diarrhea, malabsorption, or infections can

result in malnourishment and lowered disease resistance (1, 2). Nutrition management plays a prominent role in the treatment of gastrointestinal disorders.

Gastroesophageal Reflux Disease (GERD)

GERD is irritation and inflammation of the esophagus due to reflux of gastric acid into the esophagus (3). Nutritional care of GERD includes avoiding eating within 3 hours before going to bed; avoiding fatty foods, chocolate, peppermint, and spearmint, which may relax the lower esophageal sphincter; and coffee and alcoholic beverages, which may increase gastric secretion (4). Consumption of these items may need to be limited depending on individual tolerance.

Peptic Ulcer

Peptic ulcer normally involves the gastric and duodenal regions of the gastrointestinal tract (4). Because the primary cause of peptic ulcers is Helicobacter pylori infection, the focus of treatment is the elimination of the bacteria with antibiotic and proton pump inhibitor therapy. Dietary advice for persons with peptic ulcers is to avoid alcohol, coffee (with and without caffeine), chocolate, and specific spices, such as black pepper (4, 5).

Post-Bariatric Surgery

Many types of surgical procedures are used for the intervention of morbid obesity. These procedures promote weight loss by restricting dietary intakes, e.g., adjustable gastric banding (AGB), and/or bypassing some portion of intestine to cause incomplete digestion and/or malabsorption of nutrients, e.g., Roux-y gastric bypass (RYGB). Therefore, the risks for developing nutritional deficiencies after bariatric surgery are greatly increased. Since gastric bypass individuals have both a decreased availability of gastric acid and intrinsic factor, vitamin B12 deficiency can develop without supplementation. Taking daily nutritional supplements and eating foods high in vitamins and minerals are important aspects of the nutritional management for the individuals who have had bariatric surgery (6).

Short Bowel Syndrome (SBS)

SBS is the result of extensive small bowel resection. SBS in infants is mostly the result of small bowel resection for the treatment of congenital anomalies, necrotizing enterocolitis, and congenital vascular. In adults, Crohn's disease, radiation enteritis, mesenteric vascular accidents, trauma, and recurrent intestinal obstruction are the most common conditions treated by small bowel resection and resulting in SBS (4). The loss of a large segment of the small bowel causes malabsorption syndrome. Total parenteral nutrition usually is started within the first few days after intestinal resection. Gradual supplementation with enteral feeding promotes intestinal adaptation in order to wean from parenteral nutrition therapy. Supplementation with fat

soluble vitamins and vitamin B12 may be needed (7). The pediatric client's nutritional status must be assessed and growth closely monitored (8).

Inflammatory Bowel Disease (IBD)

Inflammatory bowel disease includes Crohn's disease and ulcerative colitis. Weight loss, growth impairment, and malnutrition are the most prevalent nutritional problems observed in IBD. Nutritional support is essential. Exclusive elemental nutrition has been used in attaining the remission of Crohn's disease. However, symptoms tend to recur promptly after resuming the conventional diet (9).

Liver Disease

Since the liver plays an essential role in the metabolic processes of nutrients, liver disorders have far-reaching effects on nutritional status. Acute liver injury is often associated with anorexia, nausea and vomiting. Therefore, inadequate nutritional intakes are common. Decreased bile salt secretion is associated with maldigestion and impaired absorption of fat and fat-soluble vitamins. Defects in protein metabolism associated with chronic liver failure include decreased hepatic synthesis of albumin, coagulation factors, urea synthesis and metabolism of aromatic amino acids. For nutritional therapy, an important consideration should be the balance between preventing muscle wasting and promoting liver regeneration without causing hepatic encephalopathy. It is recommended that persons with chronic liver disease consume the same amount of dietary protein as that required by normal individuals (0.74g/kg) (10).

Pancreatic Disease

In chronic pancreatitis, there is a reduced secretion of pancreatic enzymes leading to malabsorption. In severe cases, tissue necrosis can occur. It is suggested that for patients with pancreatitis, a high carbohydrate, low-fat, low protein diet may be helpful (11).

Biliary Tract Diseases

Common diseases of the biliary tract are:

- Cholelithiasis (gallstones, without infection)
- Choledocholithiasis (gallstone in the bile duct causing obstruction, pain and cramps)
- Cholecystitis (inflammation of gallbladder caused by bile duct obstruction).

Obesity or severe fasting may increase risk for these disorders. Since lipids stimulate gallbladder contractions, a low fat diet with 25% to 30% of total calories as fat is recommended. Greater fat limitation is undesirable as some fat is required for stimulation and drainage of the biliary tract. Supplementation with fat-soluble vitamins may be needed for persons with fat malabsorption or a chronic gall bladder condition (12).

WIC nutritionists can provide counseling to support the medical nutrition therapy given by clinical dietitians, and monitor compliance with therapeutic dietary regimens. They can also review and provide WIC-approved medical foods or formulas prescribed by the health care providers. In certain circumstances, WIC staff may recommend an appropriate medical food or formula to the health care provider. They should also make referrals to an appropriate health care provider for medical nutrition therapy by a clinical dietitian when indicated.

Additional Counseling Guidelines

- Explain potential nutritional risks of participant's specific GI disease
- Recommend increased nutrient intake, if needed, to correct existing deficiencies, or to counterbalance excessive losses of nutrients or fluid
- Review signs of dehydration and malnutrition due to frequent loss of nutrients via vomiting, diarrhea, malabsorption, and/or infections

Note: Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

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343 Diabetes Mellitus

Definition/Cut-Off Value

Diabetes mellitus consists of a group of metabolic diseases characterized by inappropriate hyperglycemia resulting from defects in insulin secretion, insulin action or both (1).

Presence of diabetes mellitus diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	Y
Not Breastfeeding woman	VI	Y
Infants	I	Y
Children	III	Y

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

Diabetes mellitus may be broadly described as a chronic, systemic disease characterized by:

- Abnormalities in the metabolism of carbohydrates, proteins, fats, and insulin; and
- Abnormalities in the structure and function of blood vessels and nerves (2).

The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels (1, 2) and includes type 1 diabetes mellitus, type 2 diabetes mellitus, and Maturity Onset Diabetes of the Young (MODY). MODY is a series of familial disorders characterized by early onset and

mild hyperglycemia. Specific genetic defects have been identified on chromosomes 7, 12, and 20 (2). MODY is often diagnosed before the age of 25 years. It is caused by dominantly inherited defect of insulin secretion. Persons with MODY are often non-obese and without metabolic syndrome (3).

The two major classifications of diabetes are type 1 diabetes (beta-cell destruction, usually leading to absolute insulin deficiency); and type 2 diabetes (ranging from predominantly insulin resistance with relative insulin deficiency to a predominantly insulin secretory defect with insulin resistance) (1). The Expert Committee on Diagnosis and Classification of Diabetes Mellitus, working under the sponsorship of the American Diabetes Association, has identified the criteria for the diagnosis of diabetes mellitus (1, 2) (see clarification). Long-term complications of diabetes include retinopathy with potential loss of vision, nephropathy leading to renal failure; peripheral neuropathy with risk of foot ulcers, amputations, and Charcot joints; and autonomic neuropathy causing gastrointestinal, genitourinary, cardiovascular symptoms and sexual dysfunction. Patients with diabetes have an increased incidence of atherosclerotic cardiovascular, peripheral arterial and cerebrovascular diseases. Hypertension and abnormalities of lipoprotein metabolism are often found in people with diabetes (1).

WIC nutrition services can reinforce and support the medical and dietary therapies (such as Medical Nutrition Therapy) that participants with diabetes receive from their health care providers (4).

Justification for High Risk

The chronic hyperglycemia of diabetes is associated with long term damage, dysfunction and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels. Poorly controlled diabetes can also lead to adverse health related events such as diabetic ketoacidosis.

High maternal BMI and type-1 diabetes are independent risk factors for maternal and perinatal complications, with type-1 diabetes being a stronger risk factor for adverse outcomes when compared to obesity (5).

The prevalence of adolescent type-2 diabetes is rising and has serious long term effects on health. Chronic conditions seem to progress more rapidly in adolescents with type-2 diabetes than in those of the same age who are affected by type-1 diabetes (4).

Improving diabetes outcomes by reducing chronic complications is possible through life-style interventions and dedicated attention of nutritional management and personalized education. The WIC nutritionist can play a vital role in providing nutrition counseling and assuring the participant receives comprehensive follow-up outside WIC.

Additional Counseling Guidelines

- Empower women to self-manage by obtaining information from health care providers

- Explain potential risks of DM, such as:
  All diabetics:
  - Cardiovascular disease
  - Renal disease
  - Circulatory disease
  - Foot problems
  - Vision loss
  - Hypertension

  Pregnant diabetics:
  - Difficult labor and delivery
  - Increased risk of infection, preeclampsia, toxemia, fetal malformation, fetal and neonatal death, large birth size, congenital abnormalities, neonatal death
  - More complications for infants at birth, such as may be poor feeders, may have hyperbilirubinemia or be hypoglycemic

  Breastfeeding diabetics:
  - During first few days after childbirth, diabetic mothers often experience drastic changes in blood sugar levels
    - Because it is body's natural response to childbirth hormones responsible for lactation cause physiological changes to occur more naturally
  - Drastic changes in blood sugars may occur after giving birth (i.e. increased risk of hypoglycemia during first few weeks); they require close monitoring, along with insulin and dietary adjustments
    - Once control is achieved mom should have no further problems if she follows good management practices
  - Important to receive prompt lactation support soon after delivery and while in hospital due to possible NICU and other interventions that could delay or interfere with breastfeeding
  - Milk may be a little slower coming in
    - 5 to 6 days if in good control; 6 to 7 days without good control vs. 3 to 4 days in non-diabetic moms
    - This is due to fluctuating insulin requirements and other physiologic changes
    - Early and frequent feedings may help bring in milk
  - Very important to recognize and treat hypoglycemia, especially following night-time breastfeeding
  - May be more prone to mastitis and infections of nipples and vagina
    - Risk of yeast infection increases when blood sugar levels increase
    - Use good hygiene
    - Keep nipples clean and dry after nursing
    - Treat plugged ducts, lump, sore spots promptly
- Encourage breastfeeding with MD approval
  - Breastfeeding appears to have protective effect on onset of diabetes in childhood
  - Amount of insulin needed during breastfeeding may decrease (can be up to half!) due to hormones released (insulin is compatible with breastfeeding)

        - Hormones released during breastfeeding relax mother, reducing stress (Stress can aggravate diabetes.)
    - Overall, breastfeeding tends to make diabetes more manageable
    - Psychologically, breastfeeding can help mom feel "normal" because like every other breastfeeding mother, she is able to give her baby the best
- For all diabetic participants provide basic diabetic counseling to facilitate normal blood glucose levels, such as how to:
    - Maintain optimal blood glucose levels by balancing food, activity & medications
    - Keep timing of meals consistent from day to day with carbohydrate content fairly evenly divided from meal to meal
    - Plan for midmorning and midafternoon snacks, if needed, to match food intake to peak insulin action
    - Plan for bedtime snack to prevent nocturnal hypoglycemia
    - Limit sodium intake (if participant has hypertension)
    - Limit/abstain from alcohol, especially on empty stomach
    - Consume calories adequate to maintain healthy weight
    - Maintain normal growth & development pattern in infants and children
    - Plan for periods of increased physical activity
    - Maintain appropriate blood glucose levels during illness, infections, nausea/vomiting
    - Plan for hypoglycemic episodes

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis. Diabetes mellitus is sometimes described by both patients and health professionals as "a little bit of sugar" or "high sugar." In reality, "sugar" is only one component of the pathology and clinical manifestations of the multifaceted syndrome of diabetes mellitus (2). Diabetes mellitus is diagnosed by a licensed medical provider using any one of the following three methods:

1. Fasting plasma glucose > 126 mg/dL (7.0 mmo1/l). Fasting is defined as no caloric intake for at least 8 hours.
2. Symptoms of hyperglycemia plus casual plasma glucose concentration > 200 mg/dl (11.1 mmo1/L).
    - Casual implies any time of day without regard to time since last meal.
    - The classic symptoms of hyperglycemia include polyuria, polydipsia, and unexplained weight loss.
3. Two-hour plasma glucose > 200mg/dL (11.1 mmo1/L) during a 75-g oral glucose tolerance test (OGTT) (1).

In the absence of unequivocal hyperglycemia, these criteria should be confirmed by repeat testing on a different day. The third measure (OGTT) is not recommended for routine clinical use.

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344 Thyroid Disorders

Definition/Cut-Off Value

Thyroid dysfunctions that occur in pregnant and postpartum women, during fetal development, and in childhood are caused by the abnormal secretion of thyroid hormones. The medical conditions include, but are not limited to, the following:

Thyroid Dysfunction	Definition
Hyperthyroidism	Excessive thyroid hormone production (most commonly known as Graves' disease and toxic multinodular goiter).
Hypothyroidism	Low secretion levels of thyroid hormones (can be overt or mild/subclinical). Most commonly seen as chronic autoimmune thyroiditis (Hashimoto's thyroiditis or autoimmune thyroid disease). It can also be caused by severe iodine deficiency.
Congenital Hyperthyroidism	Excessive thyroid hormone levels at birth, either transient (due to maternal Grave's disease) or persistent (due to genetic mutation).
Congenital Hypothyroidism	Infants born with an underactive thyroid gland and presumed to have had hypothyroidism in-utero.
Postpartum Thyroiditis	Transient or permanent thyroid dysfunction occurring in the first year after delivery based on an autoimmune inflammation of the thyroid. Frequently, the resolution is spontaneous.

Presence of condition diagnosed, documented, or reported by a physician or someone working under physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

The thyroid gland manufactures three thyroid hormones: thyroxine (T4), triiodothyronine (T3), and calcitonin. The thyroid hormones regulate how the body gets energy from food (metabolism). Iodine is an essential component of the T4 and T3 hormones (1) and must come from the diet. (Note: In nature, iodine does not exist as a free element; rather, it forms compounds such as sodium iodide (2, 3). For more information see Clarification section.) Iodine is available from various foods, and is present naturally in soil and sea water. A dysfunctional thyroid gland can become enlarged (goiter) as a result of an overproduction of thyroid hormones (hyperthyroidism) or conversely, from insufficient thyroid hormone production (hypothyroidism). Thyroid hormones influence virtually every organ system in the body.

Maternal needs for dietary iodine and thyroid hormone medication (if prescribed) increase during pregnancy as maternal thyroid hormones and iodine are transferred to the fetus along with an increased loss of iodine through the maternal kidneys (3). Concurrently, the fetus is unable to produce thyroid hormones during the first trimester and is entirely dependent on the maternal supply of thyroid hormones. As a result, maternal production of T4 must increase by at least 50% during pregnancy (4). If the pregnant woman is receiving thyroid hormone therapy, often a 30% - 50% increase in thyroid hormone medication is also needed.

Hyperthyroidism

Hyperthyroidism is a condition in which the thyroid gland is overactive, manufacturing too much thyroid hormone (T4 and T3). An excessive consumption of iodine (> 1000 µg/d) may cause fetal and maternal hyperthyroidism (5). In other circumstances, the thyroid might develop nodules which secrete excessive amounts of thyroid hormone regardless of iodine status (5). Enlargement of the thyroid gland (goiter) is a common symptom, as well as weight loss, fatigue, muscle weakness and an irregular heartbeat.

Hyperthyroidism is relatively uncommon in pregnancy (4). However, when it occurs, uncontrolled hyperthyroidism (especially in the second half of pregnancy) may result in infection, miscarriage, preterm delivery, preeclampsia, or congestive heart failure. Fetal complications may include prematurity, small for gestational age, fetal or neonatal thyrotoxicosis, or death (6). Postpartum maternal hyperthyroidism is likely in women with prenatal hyperthyroidism (7).

The primary medical therapy for hyperthyroidism is radioactive iodine therapy which is contraindicated during pregnancy and lactation (7). If hyperthyroidism occurs during this period, low doses of thioamide (antithyroid drug) are given instead.

Hypothyroidism

Hypothyroidism is a condition in which the thyroid gland does not make enough thyroid hormone. Maternal and fetal hypothyroidism may occur when preconception maternal iodine stores are insufficient and there is inadequate maternal iodine intake in early pregnancy. In this instance, the maternal iodine balance may become negative and may never be restored, even with eventual iodine supplementation (4).

Mothers with iodine deficiency during the first half of pregnancy may produce offspring with severe, irreversible brain damage (8). Maternal thyroid deficiency has been associated with neonatal developmental problems which may cause lasting changes in the brain structure and cognitive function.

Uncontrolled hypothyroidism in the second half of pregnancy can cause maternal complications such as anemia, preeclampsia, miscarriage, premature delivery, and postpartum thyroid disease. Fetal or neonatal complications include prematurity, low birth weight, congenital anomalies, poor neuropsychological development, and stillbirth (6).

When iodine nutrition status is adequate, autoimmune thyroid disease (AITD) – also called Hashimoto's thyroiditis - is the most common type of hypothyroidism during pregnancy (4). Pregnant women with AITD are at increased risk of miscarriage and postpartum thyroid disease (including thyroiditis, hyperthyroidism and hypothyroidism). There is an increased risk of permanent and significant impairment in cognitive function for their infants (9).

Congenital Hyperthyroidism and Hypothyroidism

Congenital hyperthyroidism is rare in neonates. Transient congenital hyperthyroidism is caused by maternal Graves' disease. Thyroid stimulating immunoglobulin passes from the mother to the fetus via the placenta and causes thyrotoxicosis in the fetus and subsequently, the neonate. After the baby is born, improvement is rapid if the condition is treated using antithyroid drugs and the hyperthyroidism will subside within several weeks (10). Persistent congenital hyperthyroidism is a familial non-autoimmune disease. It is caused by a genetic mutation resulting in an increase in the constitutive activity of the TSH receptor (11).

Congenital hypothyroidism due to maternal iodine deficiency is a leading cause of preventable mental retardation (10). Over-treatment of thyroid hormones, during pregnancy, as well as prolonged maternal iodine therapy (more than two weeks of therapy or more than 1000 µg/iodine) can also cause congenital hypothyroidism (6). The condition is exacerbated by coexisting selenium and vitamin A deficiencies or iron deficiency (5). Treatment for neonatal hypothyroidism should be started as soon as possible, as every day of delay may result in loss of IQ. Unless treated shortly after birth (within the first 18 days of life), the resulting mental retardation will be irreversible (10).

Postpartum Thyroiditis

Postpartum thyroiditis, an autoimmune inflammation of the thyroid, occurs within the first year after delivery or sometimes after termination of pregnancy. It can be a transient thyroid

dysfunction with a brief thyrotoxic phase followed by hypothyroidism, usually with a spontaneous resolution (10). Smoking is a significant precipitating factor in the onset of postpartum thyroiditis (9). Women with a past history of postpartum thyroiditis have a risk of long-term permanent hypothyroidism and recurrence of postpartum thyroiditis in subsequent pregnancies (12). Tests for this condition consist of radioactive products necessitating a temporary cessation of breastfeeding (usually for up to 3 days).

Implications for WIC Nutrition Services

Individuals with thyroid disorders can benefit from WIC foods and WIC nutrition services can reinforce and support the medical and dietary therapy prescribed by the participants' health care provider. The following nutrition education messages may be appropriate depending on the type of thyroid disorder:

• Encourage iodine sufficiency, unless contraindicated, with an adequate intake of foods high in iodine such as iodized table salt, bread, saltwater fish, kelp, egg yolks (because of iodine supplementation in chicken feed), milk and milk products (because of the treatment of cows with supplemental dietary iodine) (5). It is important to note that the salt used in manufactured foods is not iodized.

• Advise women to review the iodine content of their prenatal supplement. It is recommended that all prenatal vitamin-mineral supplements for use during pregnancy and lactation contain at least 150 micrograms of iodine a day (13). Currently, less than 50 percent of prenatal vitamins on the market contain iodine (5, 7).

• Promote breastfeeding, as there are no contraindications to breastfeeding and thyroid hormone replacement therapy as long as normal thyroxine levels in the maternal plasma are maintained. Breast milk provides iodine to the infant and is influenced by the dietary intake of the pregnant and lactating mother (14). Hyperthyroidism can develop for the first time during the postpartum period, but the mother's ability to lactate is not affected. However, if a woman with untreated hypothyroidism breastfeeds, her milk supply may be insufficient. In such instances, replacement thyroid hormone therapy is necessary to help increase milk production.

• Weight management - hyperthyroidism: The elevated plasma levels of thyroid hormones may cause increased energy expenditure and weight loss along with increased appetite. Following medical treatment, individuals with hyperthyroidism usually regain their typical body weight with a concurrent decrease in appetite (4). Therefore, the monitoring of weight status and dietary adequacy are recommended.

• Weight management – hypothyroidism: Many individuals with hypothyroidism experience an increase in weight due to both a decrease in basal metabolic rate and an excessive accumulation of water and salt. Most of the weight gained is due to the excess water and salt retention. After medical treatment, a small amount of weight may be lost, usually less than 10% of body weight (15). Once hypothyroidism has been treated and thyroid hormones are within normal levels, it is less likely that the weight gain is solely due to the thyroid. If an overweight condition persists, weight control therapy may be necessary.

• Recommend the cautionary use of soy formula and the avoidance of foods or supplements rich in soy, fiber, or iron when therapeutic thyroid medications are prescribed, since soy, iron, calcium, fiber and phytates may interfere with the absorption of oral thyroid hormone therapy (16, 17).

• Discourage smoking as the compound thiocyanate found in tobacco smoke inhibits iodine transport (9).

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

Iodine (I 2) is an element. In the ambient temperature, it is volatile and forms blue-violet gas. In nature, it does not exist as free element. Instead, it forms compounds, such as sodium **iodide** (NaI), and potassium **iodide** (KI). To prevent iodine deficiency, potassium iodide is added to the salt (most commonly to table salt) to form iodized salt (2, 3).

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Explain potential risks of **Hyperthyroidism**:
  - Result of overactive thyroid gland, leading to too much thyroid hormone in the body (must be treated medically)
- Symptoms include:
  - "Pop eyes"
  - Goiters (enlarged thyroid)
  - Strain on heart, muscles, nervous system
  - Fast pulse
  - Extreme nervousness
  - Muscle tremors
  - Weight loss, depleted body stores
- Considerations for breastfeeding mothers include:
  - The ability to breastfeed does not appear to be affected by hyperthyroidism
    - Mother's health care provider must be involved in her decision to breastfeed
  - Breastfed infants of mothers with treated hyperthyroidism must have their thyroid monitored for normal function

        - Some thyroid suppressants may suppress baby's thyroid as well; therefore, mother needs to find breastfeeding compatible medications such as PTU (Propylthiouracil) Carbimazole, or methimazole (tapazole)
- Compensate for lost weight, exhausted body reserves and depleted vitamin and minerals stores via:
    - High calorie/protein/carbohydrate diet
    - Multi-vitamin/mineral supplement (calcium, phosphorus, B-complex, and vitamin D)
- Explain potential risks of **Hypothyroidism**:
- Hypothyroidism is result of sluggish thyroid gland producing too little thyroid hormone (must be treated medically)
- Symptoms include
    - fatigue ("bone tired")
    - puffed up hands, face, eyelids
    - weight gain (because metabolism kicks into low gear)
    - depression
    - poor appetite
    - cold intolerance
    - dry skin and thinning hair
- Considerations for infants include:
    - Infant should be screened to rule out hypothyroidism (T4 & TSH testing process should not be a hazard to nursing.)
    - May not grow properly, leading to stunting
    - Breastfed infants of mothers with untreated hypothyroidism may not gain weight satisfactorily
        - Infant may fail to gain weight on breast milk alone
        - Monitor breastfed infants weight
- Considerations for breastfeeding women include:
    - Untreated hypothyroidism can result in reduced milk supply
    - Woman should be well controlled by thyroid replacement therapy to ensure full lactation
        - Health care provider must be involved in decision to breastfeed to assure thyroid supplements are compatible with breastfeeding
    - Due to sluggish metabolism leading to weight gain, low calorie diet may be warranted for mother
- Considerations for postpartum women include:
    - Identify hypothyroidism in postpartum women, especially with normal thyroid women have prolonged "baby blues" fatigue or depression
    - Screen for self-medication with drugs or herbs

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Additional References

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http://www.medicinenet.com/hashimotos_thyroiditis/article.htm

345 Hypertension and Pre-Hypertension

Definition/Cut-Off Value

Hypertension is defined as high blood pressure which may eventually cause health problems and includes chronic hypertension during pregnancy, preeclampsia, eclampsia, chronic hypertension with superimposed preeclampsia, and gestational hypertension (1, 2, 3). Prehypertension is defined as being at high risk for developing hypertension, based on blood pressure levels. Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding woman	III, IV, V or VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Hypertension (HTN), commonly referred to as high blood pressure, occurs when the force of blood against artery walls is high enough that it may eventually cause health problems. Hypertension is measured in terms of both systolic blood pressure (pressure in blood vessels when the heart contracts) and diastolic blood pressure (pressure in blood vessels when the heart rests between contractions). Two main factors in the body increase levels of blood pressure – a higher volume of blood being pumped by the heart and narrower arteries. Untreated HTN leads to many degenerative diseases, including congestive heart failure, end-stage renal disease, and peripheral vascular disease. People with HTN are often asymptomatic; diagnosis is based on measuring levels of blood pressure. (1) Blood pressure levels in adults are typically classified as follows, with the first number representing systolic blood pressure and the second number diastolic blood pressure (2, 3):

• Normal blood pressure: <120/<80 mmHg (millimeters of mercury)

• Prehypertension: consistent readings of 120-139/80-89 mmHg

• Hypertension: consistent readings of ≥140/≥90 mmHg

About 75 million adults in the United States (1 in every 3) have HTN, and about the same number have prehypertension. Unfortunately, only half of adults in the United States with HTN have their blood pressure under control, and HTN leads to at least 410,000 deaths in the United States annually. (2)

Hypertension is considered either primary/essential (there is no identifiable cause) or secondary (there is an identifiable cause). Some identifiable causes include sleep apnea, kidney problems, diabetes, some tumors, thyroid problems, inflammation, and blood vessel defects. In addition, several medications (e.g., some birth control, cold medicines, decongestants, pain relievers) as well as illegal substances can significantly raise blood pressure. (1)

Risk factors for HTN include the following (1, 2):

• Age (Risk increases with age.)

• Race/ethnicity (In the United States, people of African descent experience disproportionately higher rates of HTN compared to other races/ethnicities. Causes for this racial disparity in rates of HTN are complex and multifactorial [4, 5].)

• Family history

• Overweight or obesity (This causes more blood to be pumped by the heart.)

• Physical inactivity (This is associated with a higher heart rate, which increases the force of blood against arteries.)

• Tobacco use (This increases blood pressure during use. Chemicals in tobacco also lead to narrowing of arteries.)

• Second-hand exposure to tobacco smoke

• Excessive sodium intake (This causes fluid retention, which increases blood pressure.)

• Inadequate potassium intake (This causes an excessive amount of sodium in the blood.)

• Excessive alcohol intake (This can damage the heart over time.)

• Stress

• Prehypertension

• Pregnancy

• Male gender

Hypertension is a serious condition that can lead to a variety of health problems, including the following (1, 3):

• Cardiac pathologies, including heart attack, stroke, aneurysm, and heart failure

• Metabolic syndrome

• Chronic kidney disease

• Eye damage and vision loss

• Memory/understanding problems and dementia

• Gestational diabetes, preeclampsia, and perinatal mortality

Management of HTN includes lifestyle modifications and medication. In prehypertensive individuals, implementing lifestyle changes can prevent or delay the onset of HTN. In hypertensive individuals, dietary intervention is not only effective in reducing blood pressure but also in delaying or avoiding drug treatment.

Lifestyle changes to manage HTN and prehypertension include the following:

• Have blood pressure checked at least yearly or as recommended by one's healthcare provider. For those at risk of HTN, regular monitoring of blood pressure is crucial. Blood pressure levels greater than 180/120 mmHg are extremely dangerous and require immediate medical attention (3).

• Consume a diet consistent with the Dietary Guidelines for Americans or follow the Dietary Approaches to Stop Hypertension (DASH) eating plan. Details regarding the DASH eating plan can be found on the National Heart, Lung, and Blood Institute's website, www.nhlbi.nih.gov/health-topics/dash-eating-plan. • Engage in regular physical activity.

• Achieve and maintain a healthy weight.

• Limit alcohol and avoid any use of tobacco, marijuana or illegal substances.

If lifestyle changes alone do not sufficiently reduce blood pressure, medications may be prescribed. These include angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), calcium channel blockers, and/or diuretics (3).

Pregnant Women

Hypertension occurs in 6-8% of all pregnancies in the United States. Any HTN during pregnancy can lead to preeclampsia, eclampsia, stroke, pregnancy induction, and/or placental abruption. Because HTN during pregnancy can tighten the mother's blood vessels (including those in the umbilical cord), it can reduce oxygen and nutrients to the infant, potentially causing prematurity, low birth weight, and fetal growth restriction. (6)

Hypertensive disorders of pregnancy are categorized as follows:

• Chronic Hypertension during Pregnancy:

    o Definition: Hypertension is present before pregnancy or is diagnosed before 20 weeks gestation (6, 7).

o It increases the risk of developing more severe HTN during pregnancy, gestational diabetes, and perinatal mortality. In infants, it may lead to fetal growth restriction and, additionally, exposure to antihypertensive medications may cause fetal growth restriction and malformation. (7)

o Treatment includes frequent, regular monitoring of blood pressure. It is typically suggested that women with well-controlled blood pressure who exercised regularly before pregnancy continue moderate physical activity during pregnancy, unless contraindicated. Women should check with their healthcare provider for individualized guidance. (7)

• Preeclampsia:

o Definition: Onset of hypertension during pregnancy, typically with proteinuria, and usually after 20 weeks gestation. For some women, proteinuria does not occur; for these women, preeclampsia is diagnosed as hypertension with thrombocytopenia, impaired liver function, renal insufficiency, pulmonary edema, and/or cerebral or visual disturbances. (7)

o The most common type of hypertensive disorder during pregnancy, preeclampsia occurs in 3.4% of pregnancies in the United States and is associated with one maternal death per 100,000 live births in developed countries (7, 8). Worldwide, it leads to the death of over 60,000 women annually (9).

o Risk factors include history of preeclampsia, chronic HTN, chronic kidney disease, history of thrombocytopenia, in vitro fertilization, diabetes, auto-immune disorders (such as lupus), uterine artery notching, family history of preeclampsia, obesity, polycystic ovarian syndrome, giving birth for the first time, multifetal pregnancy, pregnancy interval greater than 10 years, and being older than 40 years (6, 7, 9, 10, 11). Low dietary and serum calcium levels are also associated with preeclampsia (9).

o Clinical signs include any of the following: proteinuria, low blood platelet count, abnormal kidney or liver function, and fluid in the lungs. Symptoms can include sudden weight gain, swelling of face or hands, upper abdominal pain, difficulty breathing, changes in vision (including seeing spots), severe headache, nausea, and/or vomiting. (7)

o For pregnant women, preeclampsia can lead to pulmonary edema (fluid build-up in the lungs), heart attack, stroke, acute respiratory distress syndrome (difficulty breathing due to fluid leaking into the lungs), coagulopathy (blood unable to clot), severe renal failure, retinal injury, liver rupture, placental abruption, hemolysis (breakdown of red blood cells), caesarean delivery, and/or death. Women with preeclampsia are at greater risk for postpartum depression, future HTN, heart attack, stroke, congestive heart failure, and metabolic disease; these risks increase with repeated incidence of preeclampsia and with preterm delivery (7, 8, 10, 12). The infant of a woman with preeclampsia is at greater risk for caesarean delivery, preterm birth, low birth weight, small for gestational

age, and/or stillbirth (8, 12). For the children of mothers who had preeclampsia, they are at heightened risk of bronchopulmonary dysplasia (form of chronic lung disease), cerebral palsy, cardiovascular dysfunction, learning disabilities, and lower IQ (10, 12). o Currently, there is inconclusive evidence on preventative measures for preeclampsia in future pregnancies. However, when dietary calcium is inadequate, research indicates adequate dietary calcium or supplementation (1.5-2 grams/day) may help prevent preeclampsia (7, 8, 9, 13). Dietary folate and folic acid supplementation during pregnancy has also been associated with lower risk of preeclampsia (12, 14).

o Treatment for preeclampsia depends on severity and other individual factors. For women with preeclampsia without severe features (hypertension with proteinuria after 20 weeks gestation), the American College of Obstetricians and Gynecologists (ACOG) currently suggests that strict bed rest not be routinely prescribed (although there may be situations in which different levels of rest, including bed rest and hospitalization, may be indicated) (7). For women with severe preeclampsia, treatment should occur in an inpatient setting, and ACOG recommends early delivery of the infant to prevent additional harm to the mother and infant (7, 10). The only known cure for preeclampsia during pregnancy is the delivery of the infant and placenta (10, 12).

o It is important to note that postpartum preeclampsia can occur, regardless of whether it was present during pregnancy. It is usually diagnosed within 48 hours of delivery but can occur up to 6 weeks postpartum. Thus, women during this period should monitor for preeclampsia symptoms and contact their healthcare provider immediately if they occur. (6, 7)

• Chronic Hypertension with Superimposed Preeclampsia:

o Definition: Hypertension is present before pregnancy, and preeclampsia develops during pregnancy. It is classified as either “with severe features” (hypertension with proteinuria before 20 weeks gestation with organ problems) or “without severe features” (hypertension with proteinuria after 20 weeks gestation). (6, 7)

• Eclampsia:

o Definition: Eclampsia is the presence of new-onset grand mal seizures in a woman with preeclampsia. Eclampsia can occur before, during, or after labor. It may be preceded by severe headaches, blurred vision, sensitivity to light, abdominal pain, hyperreflexia (over-reactive reflexes), and altered mental status. (7)

o Eclampsia is a critical situation and can lead to maternal death. Treatment typically includes parenteral magnesium sulfate in an inpatient setting. Once the mother’s condition is stabilized, ACOG recommends the delivery of the infant. Treatment with magnesium sulfate may also be continued after delivery, if needed. (7)

o Please note that due to the critical nature of eclampsia and its treatment in an inpatient setting, women with eclampsia are not encountered within a WIC setting. • Gestational Hypertension: o Definition: Onset of hypertension during pregnancy, usually after 20

weeks gestation, and without proteinuria. It usually resolves after delivery but does increase the risk of developing chronic HTN. (6)

The term “pregnancy-induced hypertension” includes preeclampsia, eclampsia and gestational hypertension. Please note that a low-sodium diet and/or weight loss is not recommended as treatment for HTN during pregnancy.

Breastfeeding

A systematic study done by the Agency for Healthcare Research and Quality found that there is an inverse relationship between duration of breastfeeding and HTN: the longer a woman breastfeeds, the less risk she has for developing HTN (15). Similarly, women with hypertension should be encouraged to breastfeed, unless contraindicated (16). If postpartum women require antihypertensive medications, medications should be chosen that are compatible with breastfeeding, if possible. It is thus very important for the mother to discuss her breastfeeding status and goals with her healthcare provider to determine the best infant feeding and medication plan.

Children

Hypertension among children is a serious condition and may eventually lead to hypertension and chronic disease in adulthood. The definition of HTN is based on the normative distribution of blood pressure in healthy children. In 2017, the American Academy of Pediatrics (AAP) updated their pediatric HTN diagnostic tools to account for the sex, age and height of the child. For more information about the definition and classification of HTN in children see the AAP Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents: https://pediatrics.aappublications.org/content/140/3/e20171904.

Early detection of high blood pressure in children is crucial for preventing future health concerns. Thus, the AAP recommends that blood pressure be measured annually once children are three years old. For children under three years of age, healthcare providers should measure blood pressure at every visit if the child has a risk factor for developing HTN. (17)

The prevalence of HTN among children and adolescents in the United States is around 3.5%. About 2-4% U.S. children and adolescents experience persistently elevated blood pressure. Higher rates are experienced by boys and among Hispanic and non-Hispanic African American children compared to white children. (17)

For most children with HTN, there is no specific, identifiable cause (thus, it is considered primary HTN). Some children, however, do experience HTN as a direct result of medications, kidney disease, endocrine disorders, or congenital heart defects. Risk factors for elevated blood pressure and HTN among children include the following (17):

• Family history of HTN, including maternal HTN during pregnancy

• Overweight and obesity (including high weight-for-length in infants)

• History of prematurity, low birth weight, and/or small for gestational age

• High sodium intake

Hypertension during childhood has implications for both current and long-term health. Health outcomes of HTN occurring in children may include the following (17):

• Dyslipidemia and cardiovascular damage

• Learning disabilities, impaired neurocognition and executive functioning

• In adulthood: HTN, metabolic syndrome, and cardiovascular disease

For the management of HTN in children, the AAP recommends the following lifestyle changes:

• Achieve and maintain a healthy weight-for-length or BMI (body mass index).

• Follow an age-appropriate DASH-type eating plan.

• Participate in moderate to vigorous physical activity at least 3-5 days per week, 30-60 minutes per session.

• Get adequate sleep (more than 7 hours a night).

For more information about HTN among children, please see the Centers for Disease Control and Prevention's website High Blood Pressure during Childhood and Adolescence at: https://www.cdc.gov/bloodpressure/youth.htm.

Implications for WIC Nutrition Services

The WIC Program provides support to participants with hypertension/prehypertension by offering fruits, vegetables, whole grains, legumes, low-fat dairy, and fish, which are important components of the DASH eating plan. WIC nutrition staff also offer nutrition education and counseling as well as referrals to smoking cessation and substance use treatment if needed, which are critical to the management of hypertension/prehypertension. In addition, WIC staff can assist participants by:

For Pregnant Women with Hypertension:

• Asking probing questions to determine the type of hypertension they have been diagnosed with during pregnancy.

• Encouraging them to start prenatal care as soon as possible and to attend all health care appointments. Health status and blood pressure should be monitored frequently by healthcare provider. The healthcare provider may also recommend regular self-monitoring of blood pressure.

• Informing them of the symptoms of preeclampsia and of the importance of contacting their healthcare provider immediately if they occur. Also, inform them that preeclampsia can occur postpartum.

• Counseling them on healthy weight gain, prenatal vitamin use, and a nutritious diet, including adequate calcium intake. For women with low calcium intake, refer them to their healthcare provider to discuss whether a calcium supplement is appropriate. Please note that a low sodium diet and/or weight loss is not recommended as treatment for HTN during pregnancy.

• Encouraging them to discuss individualized physical activity recommendations with their healthcare provider.

• Informing them that hypertension during pregnancy increases their risk of future HTN, cardiovascular disease, and stroke.

• Providing information on avoiding any use of alcohol, tobacco, marijuana or illegal substances, as well as offering substance use referrals. The WIC Substance Use Prevention Manual is available for additional guidance and referral resources (https://wicworks.fns.usda.gov/resources/wic-substance-use-prevention-guide).

• Referring to local home visiting programs for health monitoring and support, if available.

For Postpartum Women with Hypertension:

• Asking probing questions to determine the type of hypertension they experienced during pregnancy and are now experiencing.

• Informing them of the symptoms of postpartum preeclampsia and of the importance of contacting their healthcare provider immediately if they occur.

• Providing breastfeeding promotion and support, unless contraindicated. Encourage women to discuss their breastfeeding status and goals with their healthcare provider, especially if medications are prescribed.

• Encouraging them to attend all health care appointments, including their 4-6 week postpartum visit; to develop a plan for future pregnancies; to discuss health conditions and medication needs with their healthcare provider; and to have their BMI, blood pressure, lipids, and fasting glucose assessed yearly (3)

• Counseling them on achieving and maintaining a healthy weight, physical activity, following a diet consistent with the Dietary Guidelines for Americans or the DASH diet.

• Providing information on avoiding any use of alcohol, tobacco, marijuana or illegal substances, as well as offering substance use referrals. The WIC Substance Use Prevention Manual is available for additional guidance and referral resources (https://wicworks.fns.usda.gov/resources/wic-substance-use-prevention-guide).

• Referring them to their healthcare provider to discuss whether a calcium or folic acid supplement is appropriate, if intake of these nutrients seems inadequate.

• Referring to local home visiting programs for health monitoring and support, if available.

For Children with Hypertension:

• Encouraging caregivers to take children to all health care appointments.

• Counseling caregivers on: healthy pediatric weight gain and, for children with high weight-for-length or obesity, discussing strategies for achieving and maintaining a healthy weight; age specific, DASH-type eating habits; and the importance of adequate sleep and physical activity in children.

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

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346 Renal Disease

Definition/Cut-Off Value

Any renal disease including pyelonephritis and persistent proteinuria, but excluding urinary tract infections (UTIs) involving the bladder

Presence of renal disease diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	Y
Not Breastfeeding	VI	Y
Infants	I	Y
Children	III	Y

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

Renal disease can result in growth failure in children and infants. In pregnant women, fetal growth is often limited and there is a high risk of developing a preeclampsia-like syndrome. Women with chronic renal disease often have proteinuria, with risk of azotemia, if protein intake becomes too high.

Justification for High Risk

Renal disease can result in growth failure in children and infants. Children who suffer from chronic kidney disease (CKD) experience a negative impact on growth, and are significantly growth restricted in the first year of life. Typically, children with CKD fall below the 3rd percentile in length during their first 15 months and then grow at a rate parallel to the growth curve. Addressing nutrient deficiencies and metabolic acidosis can improve linear growth; however, these children most commonly receive growth hormones to achieve a normal height (3).

Children with CKD are also at greater risk for suffering cachexia or protein-energy wasting (PEW). The insufficient energy and nutrient intake may contribute to PEW. Existing evidence supports the effectiveness of supplementing calories in order to promote appropriate growth in children up to the age of 2 (4).

In pregnant women, fetal growth is often limited and there is a high risk of developing pregnancy-aggravated hypertension. Pregnant women with chronic renal disease have an increased risk of azotemia and an increased risk of other perinatal and maternal morbidities such as pre-eclampsia, preterm delivery, cesarean delivery and anemia. However, many pregnancies can be expected to have a positive and successful pregnancy outcome depending on the severity of renal disease related to increased risks. The degree of renal insufficiency is most important when predicting pregnancy outcome. When symptoms such as hypertension and proteinuria (> 500mg – 1mg/day) are poorly controlled there is an increased likelihood of detrimental outcomes in pregnancy (2, 5). Women with chronic kidney disease and mild renal insufficiency with normal or controlled hypertension have a good renal outcome and an uneventful pregnancy (5).

Overall, all WIC participants with renal disease need individual counseling with an RD, to assure that appropriate food packages and referrals are provided.

Additional Counseling Guidelines

- Potential risks for pregnant women include:
    - Decreased kidney function (temporary or permanent) as pregnancy progresses
        - Depending on disease state, may end up on hemodialysis before pregnancy ends
    - Strong possibility of developing preeclampsia-like syndrome superimposed on underlying vascular disease (i.e. pregnancy-induced hypertension)
    - Increased anemia
    - Women with chronic renal disease often have proteinuria (i.e. protein in the urine) but additional risk of azotemia is increased if she increases her protein intake
    - Premature delivery
    - SGA infant
    - Fetal loss and morbidity
- Potential risks for infants and children include:

        - Oral aversion is common
            - Infants may miss the “bonding” stage with food, so often don’t “feel” hungry
        - Inadequate growth and developmental delay leading to growth failure (i.e. FTT) as disease progresses
- Participant may be on a protein restricted diet (with greater percent being of high biological value)
- Reinforce early intervention and constant adherence to dietary recommendations and restrictions
- Refer to heath care provider for individual assessment of calcium, iron, thiamine, riboflavin, niacin and folic acid levels
- Considerations for breastfeeding women:
    - Option to breastfeed is a matter of risk: benefit ratio
        - Decision must be made with health care provider(s)

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347 Cancer

Definition/Cut-Off Value

A chronic disease whereby populations of cells have acquired the ability to multiply and spread without the usual biologic restraints

The current condition, or the treatment for the condition, must be severe enough to affect nutritional status.

Presence of cancer diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding*	I	Y
Not Breastfeeding	VI	Y
Infants	I	Y
Children	III	Y

*Some cancer treatments may contraindicate breastfeeding.

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

An individual's nutritional status at the time of diagnosis of cancer is associated with the outcome of treatment. The type of cancer and stage of disease progression determines the type of medical treatment, and if indicated, nutrition management. Individuals with a diagnosis of cancer are at significant health risk and under specific circumstances may be at increased nutrition risk, depending upon the stage of disease progression or type of ongoing cancer treatment.

Justification for high risk

Participants are at medical and nutritional risk depending on the stage of disease, form of cancer, and type of treatment. The most common nutritional risk is Protein Energy Malnutrition (PEM) and wasting. Irradiation treatment also contributes to PEM. It has been suggested that 20% of cancer patients die as a result of malnutrition rather than the cancer itself (1).

PEM is associated with impaired immune competence, increased susceptibility to infections, major organ dysfunction, and increased morbidity and mortality. Hematopoietic, GI, and immunologic systems are most affected by PEM. Some chemotherapy drugs (e.g. cytosine arabinoside) are toxic to the GI tract and pose additional nutritional risks. Symptoms of malnutrition in cancer patients include anorexia, dry mouth, nausea, stomach pain, constipation, and diarrhea. Weight loss can be detrimental if cancer patients reach a BMI ≤ 18.5, as there is a decreased chance of survival. However, it is important to not use BMI alone when assessing risk as patients with high body weights can mask loss of lean body mass. Other methods should be used in addition to BMI in order to address nutritional status (1,2,4).

Nutritional status obviously declines after initiation of treatment, where related symptoms can affect prognosis and lower patients' quality of life. WIC can assist participants in monitoring symptoms and provide patients with appropriate nutrition to maintain appropriate weight and prevent a decline in quality of life.

Additional Counseling Guidelines

- Help problem solve identify areas in dietary plan that could be improved
- Provide tricks such as modifying temperatures, textures, or using supplemental food products, especially if treatment or medications affected taste perception or appetite
    - Low-lactose diet may improve abdominal discomfort and diarrhea caused by treatment or GI infections
- If appropriate, provide additional ideas for increased calories and protein intake
- The type of cancer and stage of disease progression determines the type of medical treatment and nutrition management
    - The type of ongoing treatment may put the participant at increased nutrition risk and health risk (irradiation to the neck, esophagus, abdomen, pelvis, or intense or frequent use of corticosteroid therapy)
- PEM (Protein Energy Malnutrition) and wasting are the most common nutritional risks
    - PEM is associated with impaired immune competence, increased susceptibility to infections, etc.
    - Explain the need for protein and energy
    - Assist with meal planning and following the daily food guide with emphasis on meeting the protein group
- Dietary fat intake may need to be modified if malabsorption, maldigestion occurs

- Identify and provide counseling tips on ways to manage symptoms that impact nutrition such as dry mouth, diarrhea, nausea, constipation, difficulty chewing, anorexia, dysphagia, etc.

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348 Central Nervous System Disorders

Definition/Cut-Off Value

Conditions which affect energy requirements, ability to feed self, or alter nutritional status metabolically, mechanically, or both. These include, but are not limited to:

- epilepsy
- cerebral palsy (CP)
- neural tube defects (NTDs), such as spina bifida
- Parkinson's disease
- multiple sclerosis (MS)

Presence of central nervous system disorders diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Auto Assign

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Epileptics are at nutrition risk due to alterations in nutritional status from prolonged anti-convulsion therapy, inadequate growth, and physical injuries from seizures (1). The ketogenic diet has been used for the treatment of refractory epilepsy in children (2). However, children on a ketogenic diet for six months or more have been observed to have slower gain in weight and height (3,4). Growth monitoring and nutrition counseling to increase energy and protein intakes while maintaining the ketogenic status are recommended (4). In some cases, formula specifically prepared for children on a ketogenic diet is necessary. Women on antiepileptic drugs (AEDs) present a special challenge. Most AEDs have been associated with the risk of

neural tube defects on the developing fetus. Although it is unclear whether folic acid supplementation protects against the embryotoxic and teratogenic effects of AEDs, folic acid is recommended for women with epilepsy as it is for other women of childbearing age (5-7).

Oral motor dysfunction is associated with infants and children with cerebral palsy (CP). These infants and children often have poor growth due to eating impairment, such as difficulty in spoon feeding, biting, chewing, sucking, drinking from a cup and swallowing. Rejection of solid foods, choking, coughing, and spillage during eating are common among these children (8,9). Growth monitoring and nutrition counseling to modify food consistency and increase energy and nutrient intakes are recommended. Some children may require tube feeding and referral to feeding clinics, where available.

Limited mobility or paralysis, hydrocephalus, limited feeding skills, and genitourinary problems, put children with neural tube defects (NTDs) at increased risk of abnormal growth and development. Ambulatory disability, atrophy of the lower extremities, and short stature place NTDs affected children at high risk for increased body mass index (10). Growth monitoring and nutrition counseling for appropriate feeding practices are suggested.

In some cases, participants with Parkinson's disease require protein redistribution diets to increase the efficacy of the medication used to treat the disease (11). Participants treated with levodopa-carbidopa may also need to increase the intake of B vitamins (12). Participants with Parkinson's disease will benefit from nutrition education/counseling on dietary protein modification, which emphasizes adequate nutrition and meeting minimum protein requirements. Additionally, since people with Parkinson's often experience unintended weight loss (13), it is important to monitor for adequate maternal weight gain.

Individuals with multiple sclerosis (MS) may experience difficulties with chewing and swallowing that require changes in food texture in order to achieve a nutritionally adequate diet (14). Obesity and malnutrition are frequent nutrition problems observed in individuals with MS. Immobility and the use of steroids and anti-depressants are contributing factors for obesity. Dysphagia, adynamia, and drug therapy potentially contribute to malnutrition. Both obesity and malnutrition have detrimental effects on the course of the disease. Adequate intakes of polyunsaturated fatty acids, vitamin D, vitamin B_{12} and a diet low in animal fat have been suggested to have beneficial effects in relapsing-remitting MS (15-17). Breastfeeding advice to mothers with MS has been controversial. However, there is no evidence to indicate that breastfeeding has any deleterious effect on women with MS. In fact, breastfeeding should be encouraged for the health benefits to the infant (18). In addition, mothers who choose to breastfeed should receive the necessary support to enhance breastfeeding duration.

As a public health nutrition program, WIC plays a key role in health promotion and disease prevention. As such, the nutrition intervention for participants with medical conditions should focus on supporting, to the extent possible, the medical treatment and/or medical/nutrition therapy a participant may be receiving. Such support may include investigating potential drug-

nutrient interactions; inquiring about the participant's understanding of a prescribed special diet; encouraging the participant to keep medical appointments; tailoring the food package to accommodate the medical condition; and referring the participant to other health and social services.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Considerations for **Epilepsy**:
  - Find out if seizures are controlled by medications
    - Identify medications
    - Reinforce following prescription instructions
    - Identify possible drug nutrient interaction (e.g. Phenobarbital may increase needs of folate, vitamin D, K, calcium, B vitamins, increase risk of osteomalacia, increase appetite, increase nausea, vomiting, anorexia)
    - Address possible drug nutrient interaction through dietary recommendations
- Considerations for **Cerebral Palsy (CP)**:
  - For underweight participants, recommend increased calorie and nutrient intake and vitamin/mineral supplementation
  - For overweight participants discuss prevention of obesity
- Considerations for **Neural tube defects (NTDs)**:
  - Symptoms may include:
    - genitourinary problems, bladder and bowel incontinence
    - variable weakness to flaccid paralysis in lower extremities
    - hydrocephalic
    - possible decreased intelligence
  - For overweight participants discuss prevention of obesity
  - Encourage foods high in folic acid
    - Bioavailability of folic acid in foods is approximately half
  - If appropriate, recommend folic acid supplementation, with MD approval
    - Recommend maternal intake of at least 400µg (.4 mg) daily
    - .4 mg daily for women who have had an affected infant previously in the periconceptional period is believed to greatly reduce the risk of having infant with NTD
  - Refer women on anticonvulsant drugs to MD regarding increased risk of NTD birth (e.g. Valproic acid/Depakene and Carbamazepine are associated with NTD; folic acid reduces the risk)
  - Possible disorders of ascorbic acid metabolism may occur
  - Increase fluids to prevent bladder infections
  - Consume high fiber diet to avoid constipation

- Considerations for **Multiple Sclerosis (MS)**:
  - Identify if chewing or swallowing is affected
    - Provide recommendations for appropriate food choices and modifying food textures
    - May need to try thicker drinks, shakes, puddings
    - May need to avoid foods that crumble (e.g. crackers, toast, cakes) that can cause choking
    - Try soft, blenderized, mashed foods or stewed/cooked fruits/vegetables vs. raw
  - Identify if characteristic problems such as vision problems, weakness, fatigue, decreased coordination, numbness, paralysis, and decreased mobility affect:
    - Food shopping
    - Meal preparation
    - Self feeding
  - Provide recommendations
  - Encourage to maintain normal weight (appropriate BMI) as activity decreases
  - If constipation is a problem, provide recommendations for high fiber, increased water, exercise, etc.
  - Possibly limit caffeine intake
  - Encourage exercise as recommended by MD
    - Encourage to prevent overheating with exercise
    - Exercise in cool water, in an air-conditioned environment, with appropriate clothing (overheating temporarily aggravates MS symptoms)
  - Refer postpartum women to MD if symptoms temporarily increase after delivery (sometimes there are less symptoms during pregnancy) Studies show that pregnancy does not alter the long-term course of MS
- Considerations for **Parkinson's disease**:
  - Parkinson's is usually diagnosed in age groups in late 40s (average age 55 – 65)
  - Medications frequently used are L-dopa and carbidopa (Sinemet) and have fewer restrictions with diet interactions (e.g. protein, B6 Pyridoxine)
    - A very small percentage of patients need to decrease amount of protein in diet
    - Distribute the protein throughout day in several meals and separate their medications from the protein meals by 1 -1/2 hours.
  - Maintain appropriate BMI (prevent low BMI or weight loss)
  - Encourage exercise with MD approval
  - Provide high calorie diet
    - Encourage calorie dense food choices diet (e.g. peanut butter, cheese, whole milk)
    - Encourage more foods per day, more frequent meals
  - Identify if characteristic involuntary muscle movements affect:
    - Self feeding
    - Meal preparation/cooking

        - Walking and working in the kitchen
    - Identify swallowing difficulties (which can lead to weight loss)
        - Modify foods, textures to accommodate
    - Eating slowly or not finishing meals may be common
    - Plan cold foods for end of meal (so cooked meals do not get cold and unappealing to eat)
    - Identify if medications cause nausea or GI upset
        - Recommend small amounts of food (e.g. crackers, bread) eaten with medication to help prevent nausea
    - Identify if there is constipation
        - Increase fiber and liquids in diet

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349 Genetic and Congenital Disorders

Definition/Cut-Off Value

Hereditary or congenital condition at birth that causes physical or metabolic abnormality

The current condition must alter nutrition status metabolically, mechanically, or both.

Includes:

- Cleft lip or palate
- Down's syndrome
- Thalassemia major
- Sickle cell anemia (not sickle cell trait)
- Muscular dystrophy

Presence of genetic and congenital disorders diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

For women, infants, and children with these disorders, special attention to nutrition may be required to achieve adequate growth and development and/or to maintain health.

Severe cleft lip and palate anomalies commonly cause difficulty with chewing, sucking and swallowing, even after extensive repair efforts (2). Surgery is required for many gastrointestinal congenital anomalies. (Examples are trachea-esophageal fistula, esophageal atresia, gastroschisis, omphalocele, diaphragmatic hernia, intestinal atresia, and Hirschsprung's Disease.)

Impaired esophageal atresia and trachea-esophageal fistula can lead to feeding problems during infancy. The metabolic consequences of impaired absorption in short bowel-syndrome, depend on the extent and site of the resection or the loss of competence. Clinical manifestations of short bowel syndrome include diarrhea, dehydration, edema, general malnutrition, anemia, dermatitis, bleeding tendencies, impaired taste, anorexia, and renal calculi. Total parenteral feedings are frequently necessary initially, followed by gradual and individualized transition to oral feedings. After intestinal resection a period of adaptation by the residual intestine begins and may
last as long as 12-18 months (3). Even after oral feedings are stabilized, close follow-up and frequent assessment of the nutritional status of infants with repaired congenital gastro-intestinal anomalies is recommended (2).

Sickle-cell anemia is an inherited disorder in which the person inherits a sickle gene from each parent. Persons with sickle-cell trait carry the sickle gene, but under normal circumstances are completely asymptomatic. Good nutritional status is important to individuals with sickle-cell anemia to help assume adequate growth (which can be compromised) and to help minimize complications of the disease since virtually every organ of the body can be affected by sickle-cell anemia (i.e., liver, kidneys, gall bladder, and immune system). Special attention should be given to assuring adequate caloric, iron, folate, vitamin E and vitamin C intakes as well as adequate hydration.

Muscular dystrophy is a familial disease characterized by progressive atrophy and wasting of muscles. Changes in functionality and mobility can occur rapidly and as a result children may gain weight quickly (up to 20 pounds in a 6 month period). Early nutrition education that focuses on foods to include in a balanced diet, limiting foods high in simple sugars and fat and increasing fiber intake can be effective in minimizing the deleterious effects of the disease.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Explain that disorders affect nutrition if they cause problems with self-feeding, digestion, absorption or utilization of nutrients and/or hypoxia (low oxygen levels)
- Considerations for **Cleft Lip and Palate**:
    - Discuss and address solutions to feeding difficulties

- Infant cannot create an airtight seal (for negative pressure) to suck
- Swallowing can be affected (excessive air intake)
- Discuss and address solutions to other difficulties, such as:
  - Respiratory problems
  - More ear infections
  - Weight and height can be subnormal, due to feeding problems
  - Dental decay
- Discuss feeding methods
  - Determined by severity of cleft
  - Breastfeeding and/or pumped breast milk
    - Mom and baby may need breastfeeding assistance
    - Breastfeeding provides benefits of decreased infections, ear and respiratory and prior to surgeries and post-surgery protection
    - Aids in development of orofacial muscles
    - Breastfeeding at breast with cleft palates is very difficult and many medical professionals do not encourage it due to outcomes
    - Less severe cleft lips, especially after surgery, can be more successful at breast
    - Try different positions to get seal, both mother and baby comfortable, head slightly higher than buttocks
    - Use finger or thumb to seal cleft lips
    - Direct nipple away from back of throat
    - Support breast and chin to prevent tiring (“Dancer” position)
    - Shorter feeds may be necessary due to fatigue
    - Get “let down” before feeding
    - Pump to keep milk supply up
    - Use of hind milk
    - Support breastfeeding mom’s efforts (regardless of outcome)
  - Brecht feeder (syringe with flexible tubing)
  - Beniflex (crossed nipple)
  - Haberman feeder (large nipple with collection receptacle)
  - Supplemental Nutrition System (SNS), Infant Feeding Tube devices
  - Formula
  - Support recommended feeding techniques
  - Use feeding method for up to 4-6 months until infant can use cup and spoon feeding
- Explain importance of closely monitoring weight gain
- For older infants receiving solids:
  - Avoid acidic and spicy foods that could cause irritation of the mouth and nose
  - Avoid nuts, peanut butter, leafy vegetables, peeling of raw fruits, creamed dishes that could get caught in cleft
  - Child may eat slower, may tire before eating adequately

- Offer smaller, more frequent meals of high caloric dense foods (low fluid content)
-

- Explain lip surgery/repair:
  - Usually schedule when infant reaches 10 lbs or about 6-8 weeks
  - May use feeding assistance device until can resume breastfeeding
  - Offer water after feeding to prevent contamination of suture line
- Explain palate repair:
  - Usually schedule at 12-14 months old
  - Palatal obturator used to keep the hard palate from closing
  - Post operation - use cup feeding not spoon feeding or straw to avoid injury to the repair site
  - Diet of soft, finely pureed or mashed 10-20 days, then normal diet
  - Avoid hard foods (e.g. raw vegetables)
- Considerations for **Down Syndrome**:
  - Discuss feeding method(s)
    - Dependent on if very low tone or have other medical problems
    - Breastfeeding options and using pumped breast milk
    - Use of Supplemental Nursing System (SNS), Infant Feeding Tube device
    - Use of cup, flexible cup (e.g. – Infant Feeder)
    - Use of appropriately suited bottle and nipple
  - Discuss and address solutions to feeding difficulties
    - Mom and baby may need breastfeeding assistance
      - Encourage small frequent feedings and correct latch/positioning
      - Low muscle tone may fatigue or be less effective at feedings (e.g. - 2-3 gum presses and then sweep tongue to get milk from breast)
      - Flat tongue gets less milk at breast (doesn't cup)
      - Gulping and choking happens more easily; airway not as well protected with swallowing
      - Discuss breastfeeding techniques
      - Encourage cuddling, skin to skin for stimulation
      - Encourage to direct nipple away from back of throat or more upward to assist milk flow for easier swallowing
      - Observe nursing patterns, may change with need to burp
      - Support breast and chin to prevent tiring ("Dancer" position)
      - Shorter feeds may be necessary due to fatigue
      - Get "let down" before feeding
      - Use double electric breast pump to keep milk supply up
      - Encourage patience and learning
      - Support breastfeeding mom's efforts (irrelevant of outcome)
  - Explain importance of monitoring weight gain (use Down Syndrome growth chart for counseling)
  - For older infants receiving solids:

        - Avoid nuts, peanut butter, leafy vegetables, or foods that are difficult to manipulate in mouth or cause choking
        - May eat slower, may tire before eating adequately
        - Possibly delay introduction to solid foods due to late appearance of the chewing reflex and of teeth
        - Offer small bites, clear mouth, offer liquids due to storage of food in the high arched palate (thrusting of food out of the mouth with the tongue)
        - Use bibs/overshirts; increased mucus production
        - Offer smaller more frequent meals
- Considerations for **Sick Cell Anemia**:
    - If participant has unusually high or low hematocrit/hemoglobin, refer to MD
    - Dietary intakes should be normally low in iron
    - Iron rich foods such as liver and iron fortified cereals should be excluded
    - Requirements for water soluble vitamins are high
    - Dietary intake of fat should be low (< 30% of total calories especially if participant has liver and gall bladder disease)
    - Zinc supplementation may be helpful (refer to MD)
- Considerations for **Thalassemia**:
    - If participant has unusually high or low hematocrit/hemoglobin, refer to MD
    - Include diet rich in water soluble vitamins
    - Recommend diet low in iron if transfusions are part of treatment
- Considerations for **Muscular Dystrophy**:
    - Refer to MD for monitoring medications and possible side effects, GI problems
    - Calorie requirements may be less than normal
    - Limit high calorie, low nutrient density foods
    - Limit fat to no greater than 30% of total calories
    - Increase fiber if constipation is a problem
    - Watch for increase in weight gain, (increase in BMI), or obesity
        - Encourage following exercise program, physical and respiratory therapies
    - Watch for swallowing difficulties, if phlegm accumulates due to ingestion of dairy
        - Ensure adequate calcium intake and use juices to clear phlegm
    - Watch for changes in functional ability or mobility that affect caloric intake (e.g. self feeding) or caloric expenditure (e.g. ability to walk/move)
    - May need to use rubber mesh mat or moistened paper towel under plate to prevent slipping
    - Use lightweight plastic bowls vs. glass or ceramic
    - Increase diameter of eating utensils with foam
    - Use wide-handled plastic mugs & sip cups, two handled cups or water bottles with straws
    - Cut out rim of disposable cup to fit child's nose (allows chin forward comfort)
    - For swallowing difficulties:
        - Suck ice chips to desensitize the gag reflex (adults)
        - Tip chin down if food gathers in the back of the mouth

- Place frozen package of peas on the front of the neck to relax muscle spasms

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351 Inborn Errors of Metabolism

Definition/Cut-Off Value

Inherited metabolic disorders caused by a defect in the enzymes or their co-factors that metabolize protein, carbohydrate, or fat.

Inborn errors of metabolism (IEM) generally refer to gene mutations or gene deletions that alter metabolism in the body, including but not limited to:

Inborn Errors of Metabolism*	
Amino Acid Disorders	Urea Cycle Disorders
Organic Acid Metabolism Disorders	Carbohydrate Disorders
Fatty Acid Oxidation Disorders	Peroxisomal Disorders
Lysosomal Disorders	Mitochondrial Disorders
**For more information about additional IEM, please see Clarification*	

Presence of condition diagnosed, documented, or reported by a physician or someone working under physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	Y
Not Breastfeeding	VI	Y
Infants	I	Y
Children	III	Y

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

The inheritance of most metabolic disorders is rare. IEM disorders may manifest at any stage of life, from infancy to adulthood. Early identification of IEM correlates with significant reduction in morbidity, mortality, and associated disabilities for those affected (1).

All States screen newborns for IEM, although the type and number of IEM screened for may vary from State to State. Typically, infants are screened for amino acid disorders, urea cycle disorders, organic acid disorders, and fatty acid oxidation defects. A few States are working toward including lysosomal storage diseases and peroxisomal disorders among their newborn screening panels (2).

In most states, treatment of an IEM is referred to a specialized metabolic treatment facility. Please see Clarification for contact information for treatment facilities. IEM treatment is based on symptomatic therapy which may include the following strategies: substrate restriction; stimulation or stabilization of residual enzyme activity; replacement of deficient products; removal of toxic metabolites or blocking their production; and enzyme replacement therapy (3). Avoidance of catabolism is essential at all treatment stages.

Nutrition therapy is integral to the treatment of IEM. Nutrition therapy should both correct the metabolic imbalance and ensure adequate energy, protein, and nutrients for normal growth and development among affected individuals. Continual monitoring of nutrient intake, laboratory values, and the individual's growth are needed for evaluation of the adequacy of the prescribed diet (4). It is important that caregivers of infants and children with IEM ensure that the patient follows the prescribed dietary regimen. The below embedded links provide the most up-to-date information about the disease state as well as treatment.

Amino Acid Metabolism Disorders (3)

- Phenylketonuria (includes clinically significant hyperphenylalaninemia variants)
- Maple syrup urine disease
- Homocystinuria
- Tyrosinemia

Amino Acid Metabolism Disorders are characterized by the inability to metabolize a certain essential amino acid. The build-up of the amino acid that is not metabolized can be toxic. Treatment of amino acid disorders involves restricting one or more essential amino acids to the minimum required for growth and development and supplying the missing product due to the blocked reaction.

Carbohydrate Disorders (5)

- Galactosemia
- Glycogen storage disease type I
- Glycogen storage disease type II (See also Pompe disease)
- Glycogen storage disease type III
- Glycogen storage disease type IV (Andersen Disease)
- Glycogen storage disease type V

• Glycogen storage disease type VI
• Hereditary Fructose Intolerance (Fructose 1-phosphate aldolase deficiency, Fructose 1, 6, biphosphatase deficiency, fructose kinase deficiency)

This group of disorders includes an enzyme deficiency or its cofactor that affects the catabolism or anabolism of carbohydrate. Carbohydrate disorders are complex and affect neurological, physical, and nutritional status.

Fatty Acid Oxidation Defects (5)

• Medium-chain acyl-CoA dehydrogenase deficiency
• Long-chain 3-hydroxyacyl-CoA dehydrogenase deficiency
• Trifunctional protein deficiency type 1 (LCHAD deficiency)
• Trifunctional protein deficiency type 2 (mitochondrial trifunctional protein deficiency)
• Carnitine uptake defect (primary carnitine deficiency)
• Very long-chain acyl-CoA dehydrogenase deficiency

Fatty acid oxidation defects include any enzyme defect in the process of mitochondrial fatty acid oxidation (FAO) system. The biochemical characteristic of all FAO defects is abnormal low ketone production as a result of the increased energy demands. This results in fasting hypoglycemia with severe acidosis secondary to the abnormal accumulation of intermediate metabolites of FAO, which can result in death.

Organic Acid Disorders (AKA organic aciduria or organic acidemia) (6)

• Isovaleric acidemia
• 3-Methylcrotonyl-CoA carboxylase deficiency
• Glutaric acidemia type I
• Glutaric acidemia type II
• 3-hydroxy-3-methylglutaryl-coenzyme A lyase deficiency
• Multiple carboxylase deficiency (Biotinidase deficiency, Holocarboxylase synthetase deficiency)
• Methylmalonic acidemia
• Propionic acidemia
• Beta-ketothiolase deficiency

Organic Acid Disorders are characterized by the excretion of non-amino organic acids in the urine. Most of the disorders are caused by a deficient enzyme involving the catabolism of specific amino acid(s). As a result, the non-metabolized substance accumulates due to the blockage of the specific metabolic pathway, which is toxic to certain organs and may also cause damage to the brain (7).

Lysosomal Storage Diseases (6, 8)

• Fabry disease (α-galactosidase A deficiency)
• Gauchers disease (glucocerebrosidase deficiency)

• Pompe disease (glycogen storage disease Type II, or acid α-glucosidase deficiency)

Lysosomal storage diseases are a group of related conditions characterized by increased storage of undigested large molecule in lysosomes. Lysosome is a cellular organelle responsible for intracellular degradation and recycling of macromolecules. Due to a defect in a specific lysosomal enzyme, the macromolecule that normally would be metabolized is not broken down; instead, it accumulates in the lysosomes. This leads to tissue damage, organ failures and premature death. Common clinical features include bone abnormalities, organomegaly, developmental impairment and central, peripheral nervous system disorders.

Mitochondrial Disorders (6, 8)

• Leber hereditary optic neuropathy
• Mitochondrial encephalomyopathy, lactic acidosis, and stroke-like episodes (MELAS)
• Mitochondrial neurogastrointestinal encephalopathy disease (MNGIE)
• Myoclonic epilepsy with ragged-red fibers (MERRF)
• Neuropathy, ataxia, and retinitis pigmentosa (NARP)
• Pyruvate carboxylase deficiency

Mitochondrial Disorders are caused by the dysfunction of the mitochondrial respiratory chain, or electron transport chain (ETC). Mitochondria play an essential role in energy production. The ETC dysfunction increases free radical production, which causes mitochondrial cellular damage, cell death and tissue necrosis and further worsens ETC dysfunction and thus forms a vicious cycle. The disorders can affect almost all organ systems. However, the organs and cells that have the highest energy demand, such as the brain and muscles (skeletal and cardiac) are most affected. The clinical features vary greatly among this group of disorders, but most have multiple organ dysfunctions with severe neuropathy and myopathy.

Peroxisomal Disorders (6, 8, 9)

• Zellweger Syndrome Spectrum
• Adrenoleukodystrophy (x-ALD)

There are two types of peroxisomal disorders: single peroxisomal enzyme deficiencies and peroxisomal biogenesis disorders. These disorders cause severe seizures and psychomotor retardation (9). Peroxisomes are small organelles found in cytoplasm of all cells. They carry out oxidative reactions which generate hydrogen peroxides. They also contain catalase (peroxidase), which is important in detoxifying ethanol, formic acid and other toxins. Single peroxisomal enzyme deficiencies are diseases with dysfunction of a specific enzyme, such as acyl coenzyme A oxidase deficiency. Peroxisomal biogenesis disorders are caused by multiple peroxisome enzymes such as Zellweger syndrome and neonatal adrenoleukodystrophy.

Urea Cycle Disorders (6, 5)

- Citrullinemia
- Argininosuccinic aciduria
- Carbamoyl phosphate synthetase I deficiency

Urea Cycle Disorders occur when any defect or total absence of any of the enzymes or the cofactors used in the urea cycle results in the accumulation of ammonia in the blood. The urea cycle converts waste nitrogen into urea and excretes it from the kidneys. Since there are no alternate pathways to clear the ammonia, dysfunction of the urea cycle results in neurologic damage.

Implications for WIC Nutrition Services

WIC can provide exempt infant formulas and WIC-eligible medical foods, including those specifically formulated for IEM. Most of the dietary regimens for IEM require a combination of medical food (special formula in most cases) and standard infant formula or prescribed conventional foods. For example, participants with IEM related to essential amino acid metabolism (such as PKU, MSUD), who are not developmentally ready for conventional foods; require both medical food without the offending amino acid(s), and human milk or standard infant formula.

It is recommended that WIC nutritionists collaborate with the clinical dietitians at the metabolic treatment facility, where available, to prescribe WIC food packages (Food Package III) according to the therapeutic diet ordered by the metabolic team, monitor the compliance of the restricted diet, and follow up on the growth and developmental status of the participants with IEM.

Note: Infants with classic galactosemia cannot be breastfed due to lactose in human milk.

Clarification

IEM not listed within this write-up may be found under: http://rarediseases.info.nih.gov/GARD. Please keep in mind these additional resources are not meant for medical advice nor to suggest treatment.

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

The link below lists newborn screening coordinators. The coordinator can direct families to appropriate metabolic treatment facilities based on the newborn screening result: http://genes-r-us.uthscsa.edu/State_contacts.pdf.

Justification for High Risk

Untreated pregnant women with certain inborn errors of metabolism have a higher risk of spontaneous abortion and other health or nutrition risks. Significant adaptation of energy, carbohydrate and amino acid metabolism occurs early in prenatal and neonatal development (10). Many metabolic errors in metabolism affect these pathways and such disturbances may lead to poor intrauterine growth and maternal health.

Infants born to mothers with untreated PKU may show fetal growth restriction, microcephaly, low birth weight, and congenital heart disease. If not detected and treated soon after birth, infants accumulate abnormal metabolites in their blood, resulting in mental retardation, seizures, growth retardation, and developmental delays. Infants with inborn metabolic errors typically exhibit lethargy, decreased feeding, vomiting, seizures, and failure to thrive. As these infants get older they may miss cognitive milestones, loss of language skills, progressive deficits in attention or focus and other behavioral changes (4). Appropriate dietary management, which includes the use of special formulas, can minimize the medical risks to the individual. WIC can provide nutritional treatment tailored to each of the inborn errors of metabolism and refer participants to a physician who may recommend carnitine supplementation.

Additional Counseling Guidelines

- Considerations for **Phenylketonuria (PKU)**:
    - Individuals with PKU lack the enzyme to convert phenylalanine (an essential amino acid) to tyrosine
    - Pregnant women are at higher risk of spontaneous abortion or other health or nutrition risks
    - High levels of phenylalanine and its metabolites are toxic to the developing central nervous system
        - Risk to fetus and newborn such as IGR, congenital anomalies, mental retardation
    - Total restriction of phenylalanine can also cause problems such as microcephaly, intrauterine growth retardation, FTT
    - Infants born to mothers with untreated PKU may show fetal growth restriction, microcephaly, LBW, and congenital heart disease
        - Infants need to be treated soon after birth to prevent serious health problems
- Review benefits of treatment:
    - During pregnancy, lowering intake of phenylalanine to normal levels reduces the risk of damage to the fetus or newborn

  - Infants and children who receive early and continuous dietary treatment can normalize blood phenylalanine and can have normal mental development
- Reinforce:
  - Infants with PKU should not be exclusively breastfed
    - They need to follow their prescription for low phenylalanine formula in conjunction with breastfeeding (e.g. Phenex 1, Analog XP)
  - Individuals with disorders, or parent/caregiver, need to learn foods low in phenylalanine, portion sizes, planning for diet
  - Not to use artificial sweetener aspartame
    - For foods containing it, read labels (no NutraSweet, Equal)
- Considerations for **Galactosemia**:
- Reinforce:
  - Importance of receiving ongoing medical/dietary care
  - No breastfeeding
  - Importance of following prescribed formula or dietary prescription which may change with the participant's needs
- Considerations for **Hyperlipoproteinemia (HLP)**:
- Reinforce:
  - Need for ongoing medical/dietary care
  - Need to follow dietary recommendations (which are individualized depending on the type) such as:
    - Decrease saturated fat
    - Decrease cholesterol
    - Increase fiber
    - Decrease alcohol
  - Follow medications
  - Participants with high triglyceride levels and/or hypertension need to follow MD treatment, such as:
    - No smoking
    - Regular exercise
  - Encourage compliance to prevent atherosclerosis and coronary heart disease

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352a Infectious Diseases – Acute

Definition/Cut-off Value

A disease which is characterized by a single or repeated episode of relatively rapid onset and short duration. Infectious diseases come from bacteria, viruses, parasites, or fungi and spread directly or indirectly from person to person (1). Infectious diseases may also be zoonotic, which are transmitted from animals to humans, or vector-borne, which are transmitted from mosquitoes, ticks, and fleas to humans (1,2). These diseases and/or conditions include, but are not limited to (an extensive listing of infectious diseases can be found at: http://www.nlm.nih.gov/medlineplus/infections.html):

Most Common Acute Infectious Diseases	
Hepatitis A	Listeriosis
Hepatitis E	Pneumonia
Meningitis (Bacterial/Viral)	Bronchitis (3 episodes in last 6 months)
Parasitic Infections	

The infectious disease must be present within the past six months, and diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority
Pregnant Women	I
Breastfeeding Women	I
Not Breastfeeding woman	VI
Infants	I
Children	III

Justification

Both chronic and acute infectious diseases can lead to: 1) poor appetite, 2) low nutrient absorption, 3) accelerated nutrient utilization, and/or 4) rapid nutrient loss, depending on the individual's nutritional state before becoming infected and the individual's diet during the improvement period (3). The following information pertains to some of the more prevalent and/or serious acute infectious diseases.

Justification for High Risk

Not Applicable

VIRAL HEPATITIS

Hepatitis is inflammation of the liver. It is most often caused by viruses, but can also be caused by excessive alcohol consumption, toxins, and medicines such as acetaminophen, as well as other medical conditions linked to liver inflammation (4). Viral hepatitis is caused by a series of viruses labeled A, B, C, D, and E – with A, B, and C being the most common forms in the United States. Viral hepatitis A and E are the only forms that are acute and do not become chronic, whereas B, C, and D can both be acute and chronic in nature (5). (For more information on chronic infectious diseases see Risk #352b Infectious Diseases – Chronic.) Regardless of the type of hepatitis, infected individuals with signs of the infection will typically experience anorexia, nausea, vomiting, diarrhea, jaundice, epigastria pain, tiredness, and weakness, all of which affect one's diet and health (5). In addition, darker urine and pale stools may be present in infected individuals. It is important to note that viral hepatitis is the leading cause of liver cancer and the most frequent need for liver transplants in the United States (6).

Hepatitis A: Hepatitis A is an acute infection caused by exposure to the Hepatitis A virus. It is transmitted through the fecal-oral route, with transmission most commonly spread through close contact with an infected household member or sexual partner. Outbreaks can also be caused by fecal-contaminated food
or water. Because the symptoms of all types of acute hepatitis infections are the same, suspected diagnosis must be confirmed through either positive laboratory testing, or epidemiologic link to a confirmed case. (7)

A large majority of those infected with Hepatitis A are asymptomatic, with 70% showing no clinical signs of infection. Hepatitis A does not progress to a chronic disease, and symptoms typically resolve without treatment in two months, however in 10-15% cases periodic relapses can occur for up to six months. (8)

The Hepatitis A virus can survive for months outside of the body, therefore proper hygiene and food safety are important preventative measures. However, the most effective method of preventing infection is through vaccination, which has reduced the incidence of Hepatitis A by 95% since its introduction. Emphasis should be placed on preventing an unvaccinated child from close personal contact with someone who is at high risk or suspected of Hepatitis A infection. (7)

Hepatitis E: Hepatitis E is an acute infection caused by exposure to the Hepatitis E virus. It is transmitted through the fecal-oral route, most commonly through ingestion of contaminated

drinking water. However recent cases have been linked to uncooked/undercooked meat and shellfish, indicating the potential for foodborne exposure. While Hepatitis E is believed to be uncommon in the United States, those who frequently travel to developing countries with poor water and environmental sanitation are at risk of becoming infected. Diagnosis for Hepatitis E can be confirmed only by testing for the presence of antibodies to the virus or viral RNA. There are currently no serological tests approved for use in the United States. (9)

Hepatitis E symptoms typically resolve on their own, and there is currently no therapeutic treatment or approved vaccine for the disease. Supportive therapy should be offered and hospitalization recommended for severe cases. The predominant forms of prevention are good sanitation and only relying on clean drinking water when in areas at high risk for infection. (10)

Pregnant women are especially at risk when infected with Hepatitis E. While in general most people will recover completely and the death rate among confirmed cases is about 1%, the mortality rate can reach 10-30% for women in their third trimester. (9)

MENINGITIS

Characterized by an inflammation of the protective membranes known as the meninges, meningitis is typically caused by an infection of the fluid surrounding the brain and the spinal cord. Most commonly meningitis is caused by a bacterial or viral infection, but it can also result as a response to physical injury, cancer, or certain drugs. Due to the severity of meningitis and resulting treatment differing depending on the cause, it is important to correctly diagnose the agent responsible for the disease. (11)

Bacterial Meningitis: While most people with meningitis typically recover, bacterial meningitis is typically severe and can result in serious complications, including brain damage, hearing loss, or learning disabilities. The leading causes of bacterial meningitis in the United States include Haemophilus influenzae, Streptococcus pnemoniae, Listeria monocytogenes, and Neisseria meningitidis. The causes of meningitis vary by age group. In adults, including pregnant women, it is most commonly caused by Streptococcus pneumoniae, Neisseria meningitidis, and Listeria monocytogenes. The cause in newborns is most typically Group B Streptococcus, E. coli, and Listeria. Infants and children most commonly develop meningitis in response to Streptococcus pneumoniae, Neisseria meningitidis, and Haemophilus influenzae type b. (12)

In addition, *Cronobactor* may cause severe meningitis in infants. Although *Cronobactor* infection is rare (the Centers for Disease Control and Prevention reports 4-6 infections in infants per year), meningitis due to *Cronobactor* occurs almost exclusively among infants in the first 2 months of life. *Cronobactor* infections have been associated with consumption of reconstituted powdered infant formula. In several outbreak investigations, *Cronobactor* has been found in powdered infant formula that had been contaminated in the factory. In other cases, the powdered infant formula might have been contaminated with *Cronobactor* after it was opened at home or elsewhere. It is recommended that manufacturer's preparation instructions be adhered to in order to prevent *Cronobactor* infection in infants consuming reconstituted powdered infant formula. (13)

Risk factors for bacterial meningitis include, but are not limited to, age, with infants at higher risk than other age groups; congregate living settings, with groups such as military personnel and

college students at increased risk; medical conditions that weaken the immune system; and travel to the meningitis belt in sub- Saharan Africa. Transmission from an infected person usually requires prolonged, close, contact. Additionally, healthy people may carry the bacteria in their nose and throat without developing an illness and most healthy people who carry the disease never become sick. Pregnant women infected with any of the bacteria responsible for causing meningitis are capable of passing the bacteria to their baby, putting them at increased risk of developing meningitis. (12)

Meningitis symptoms are characterized by a sudden onset of fever, headache, and stiff neck. Other symptoms are also often present, including nausea, vomiting, sensitivity to light, and confusion. Diagnosis must be confirmed through laboratory testing of the blood or cerebrospinal fluid. Bacterial meningitis is effectively treated with antibiotics, though it is important to begin treatment as early as possible. (12)

The most effective method of preventing meningitis is vaccination. There are currently vaccines available for three types of meningitis causing bacteria - *Neisseria meningitidis* (meningococcus), *Streptococcus pneumoniae* (pneumococcus), and *Haemophilus influenzae* type b (Hib). Additionally for individuals in close contact with those with the disease, antibiotics may be recommended as a preventative measure. The risk of meningitis resulting from Listeria can be prevented by properly preparing and refrigerating food as well as avoiding certain foods. Women diagnosed with group B strep are also given antibiotics during labor to prevent transmission to their newborn. (12)

Viral Meningitis: Viral meningitis is the most common type of meningitis and is often less severe than bacterial caused cases. In the United States it is most commonly caused by non-polio enteroviruses, as well as others including the mumps, herpes, measles, influenza, and arboviruses. While few people infected with these viruses develop meningitis, the risk is especially high from summer to fall. Children younger than five and people with weakened immune systems are at higher risk of developing the disease, with infants younger that one month old and people with weakened immune systems more likely to develop severe illness. (14)

Transmission of a virus that can lead to meningitis may occur due to close contact with a person who has viral meningitis, however it is unlikely meningitis will develop. Symptoms in infants include fever, irritability, poor eating, sleepiness or trouble waking, and lethargy. Adults most commonly experience fever, headache, stiff neck, light sensitivity, sleepiness or trouble waking, nausea, vomiting, lack of appetite, and lethargy. As with bacterial meningitis, diagnosis requires lab tests to confirm the illness. (14)

Typically, viral meningitis resolves without treatment in 7-10 days. However, those with meningitis caused by the herpes virus or influenza may benefit from antiviral medication. While there are no vaccines available for the non-polio enteroviruses that can cause meningitis, the following steps can be taken to reduce the risk of infection:

- Washing hands often with soap and water, especially after changing diapers, using the toilet, or coughing or blowing your nose.

- Avoiding face touching with unwashed hands.
- Avoiding close contact with infected persons.
- Cleaning and disinfecting frequently touched household surfaces.
- Staying home when sick.

Additionally, children should be vaccinated against the other viruses that can cause meningitis, including measles, mumps, chickenpox, and influenza. (14)

LISTERIOSIS

Listeriosis is a serious infection caused by the bacteria *Listeria monocytogenes*. It is most commonly transmitted through contaminated food; however, it is also naturally present in the soil, water, and animals, including poultry and cattle (15). Listeria is especially dangerous due to its ability to grow in cold temperatures, unlike many other pathogens (16). Common food sources include ready-to-eat deli meats and hot dogs, unpasteurized milk and dairy products, raw sprouts and others. Symptoms include fever, stiff neck, confusion, weakness, vomiting, and diarrhea (17).

Pregnant women and newborns are at exceptionally high risk for listeriosis, with pregnant women 10-20 times as likely as the general population to become infected (18). It can lead to miscarriage, stillbirth, or lifelong health issues for the child (19). Additionally, those with weakened immune systems are also at heightened risk. Listeriosis is treated with antibiotics and for severe cases referral to a medical facility may be necessary. The best methods of prevention are associated with proper food safety, handling, and storage. Additionally, raw milk and raw dairy products should be avoided. There is currently no vaccine available. (17)

PNEUMONIA

Pneumonia is an infection of the lungs that can cause mild to severe illness. It can be caused by viruses, bacteria, and fungi. In the United States the most common causes of viral and bacterial pneumonia are respiratory synctal virus (RSV) and Streptococcus pneumonia (pneumococcus), respectively, however Human Parainfluenza Viruses are the leading cause of pneumonia in infants and children. Symptoms include fever, muscle aches, fatigue, enlarged lymph nodes in the neck, chest pain, sore throat, coughing, shortness of breath, and rapid breathing. (20)

Children younger than five years of age are considered at especially high risk of pneumonia. Additionally, pneumonia contracted during pregnancy has been associated with increased morbidity and mortality when compared with non-pregnant women. It can lead to negative outcomes including low birth weight, increased risk of pre-term birth, and serious complications for the mother including respiratory failure.

Treatment includes administering antimicrobial and antiviral drugs depending on the pathogen responsible for the infection. (21)

Vaccination is an effective way to prevent pneumonia, with several vaccinations available for both bacteria and viruses including pneumococcal, Haemophilus influenzae type b (Hib), pertussis (whooping cough), varicella (chickenpox), measles, and influenza vaccines. Good hygiene is also another effective method of prevention, including regular hand-washing and disinfecting frequently touched surfaces. (20)

BRONCHITIS

Acute bronchitis is diagnosed by a healthcare provider based on the signs and symptoms present in the patient. It is a condition that occurs when the airways in the lungs swell and produce mucus, resulting in a cough. Bronchitis typically occurs after a chest cold and is usually caused by a virus, with the most common being: Respiratory syncytial virus (RSV), Adenovirus, Influenza viruses, and parainfluenza. Symptoms include but are not limited to coughing that produces mucus; soreness in the chest; fatigue; headache; body aches; fever; and sore throat. Most symptoms of acute bronchitis resolve on their own after two weeks, but the cough may last up to eight weeks in some cases. In severe cases, such as a fever above 100.4 degrees Fahrenheit, patients should seek assistance from a health care provider. (22)

Since bronchitis is almost never caused by bacteria, antibiotics are not needed or recommended. Furthermore, antibiotic treatment may cause harm in both children and adults (20). The best course of action is to provide symptom relief through rest, over-the-counter medicines, and other self-care methods. It is important to use pain relievers appropriate for the age of the child, and only acetaminophen for babies six months of age and younger (23). Bronchitis may be prevented by avoiding smoking, practicing good hygiene, and remaining current on all immunizations (22).

PARASITIC INFECTIONS

Parasites are organisms that live on or in a host organism and survive by getting their food at the detriment of the host. Pregnant women and children are most at risk from certain types of parasites including *Toxoplasma gondii* – found in uncooked meat; *Giardia intestinalis*; *Cryptosporidium;* lice; and pinworms (24). Toxoplasmosis, caused by *Toxoplasma gondii*, is considered to be the leading cause of death attributed to foodborne illness in the United States (25). To reduce the risk of parasitic infection, prevention includes good food safety and general good hygiene. Additionally environmental risk can be reduced by wearing gloves when coming into contact with soil, covering sandboxes, and teaching children the importance of hand washing (26).

Most healthy people will recover from parasites without treatment. However, for pregnant women, newborns, and infants with toxoplasmosis, treatment can be administered as a combination of drugs such as pyrimethamine and sulfadiazine, plus folinic acid (27). This treatment will reduce the parasitic burden, but will not eliminate it completely as parasites can remain in tissues, which makes it hard for the medication to reach them. Lice and other dermal parasites can be treated with topical drugs, such as medicated shampoo (24).

Implications for WIC Nutrition Services

WIC can improve the management of acute infectious diseases through WIC foods, nutrition education, counseling, and referrals to community resources. The table below provides additional WIC nutrition services recommendations specific to the disease state that can help improve the health outcomes of participants with acute infectious diseases:

	WIC Nutrition Services Recommendations for Acute Infectious Diseases (9,10)
All Types of Infections	• Encourage sufficient calorie intake to ameliorate accelerated nutrient utilization. • Recommend the *Dietary Guidelines* to ensure healthy eating patterns. • Provide suggestions to address poor appetite. • Provide education on safe food handling and storage practices.
All Types of Hepatitis	• Recommend testing to pregnant women and high risk individuals. • Encourage abstinence from alcohol. • Provide information on high calorie, high protein and moderate fat diets. • Recommend high calorie consumption at breakfast as nausea is less common in the morning. • Recommend, in consultation with health care provider, consumption of high calorie and protein liquid formula between meals to boost calorie intake. • Encourage a bland diet with extra fluids depending on the severity of nausea and vomiting.
Hepatitis A	• Encourage the Hepatitis A vaccine for all children, previously unvaccinated adolescents through the age of 18, and high-risk adults. • Promote breastfeeding as being safe, but to avoid breastfeeding when nipples are cracked and bleeding – at which time, mothers should pump and discard milk to maintain supply. • Discourage the practice of pre-chewing food for infants, as blood may be present.
Hepatitis E	• Avoid contaminated water.
Meningitis	• Encourage vaccinations for both bacteria and viruses known to cause meningitis. • Provide education on proper food handling and storage practices. • Recommend use of manufacturer's instruction for the preparation of infant formula. • Provide education on good hygiene practices.
Listeriosis	• Recommend alternatives to raw milk and dairy products. • Emphasize importance of safe food handling, preparation and storage practices.
Pneumonia	• Recommend referral to a healthcare provider to administer appropriate antimicrobial or antiviral treatment.
Bronchitis	• Provide education on symptom relief and proper pain-medication practices for children. • Recommend smoking cessation. • Provide education on good hygiene practices. • Encourage appropriate vaccinations.
Parasitic Infections	• Recommend appropriate measures be taken when coming into contact with potential environmental contaminants, e.g., use of gloves when working with soil and covering sandboxes when not in use. • Provide education on proper food handling and storage practices. • Provide education on good hygiene practices.

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

352b Infectious Diseases - Chronic

Definition/Cut-off Value

Conditions likely lasting a lifetime and require long-term management of symptoms. Infectious diseases come from bacteria, viruses, parasites, or fungi and spread directly or indirectly, from person to person (1). Infectious diseases may also be zoonotic, which are transmitted from animals to humans, or vector-borne, which are transmitted from mosquitoes, ticks, and fleas to humans (1, 2). These diseases and/or conditions include, but are not limited to (an extensive listing of infectious diseases can be found at: (http://www.nlm.nih.gov/medlineplus/infections.html):

Chronic Infectious Diseases*	
HIV Human Immunodeficiency Virus	Hepatitis B
AIDS Acquired Immunodeficiency Syndrome	Hepatitis C
Hepatitis D	

Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority
Pregnant Women	I
Breastfeeding Women	I
Not Breastfeeding woman	VI
Infants	I
Children	III

Justification

Both chronic and acute infectious diseases can lead to 1) poor appetite, 2) low nutrient absorption, 3) accelerated nutrient utilization, and/or 4) rapid nutrient loss, depending on the individual's nutritional state before becoming infected and the individual's diet during the improvement period (3). The following information pertains to some of the more prevalent and/or serious chronic infectious diseases.

Human Immunodeficiency Virus (HIV)/ Acquired Immunodeficiency Syndrome (AIDS)

The Human Immunodeficiency Virus (HIV) is a chronic virus that reduces an individual's ability to fight off infections and diseases (4). HIV destroys white blood cells found in the immune system, also known as CD4

(cluster of differentiation) or T cells (T lymphocytes) (5). HIV is transmitted only through blood, semen, pre- seminal fluid, rectal fluids, vaginal fluids, and breast milk from an HIV-infected person (6). HIV can lead to Acquired Immunodeficiency Syndrome (AIDS) if left untreated (4). Individuals who are aware of their HIV status and are undergoing antiretroviral therapy (ART) to stop the replication of the virus, can typically live decades – while those unaware of their status or are not on ART, can usually remain in this stage about ten years before progressing to the AIDS stage. Some individuals may progress to the AIDS stage sooner than
10 years. During the time period a person progresses from HIV to AIDS, the immune system becomes extremely weakened and can no longer protect against other infections or opportunistic illnesses** - which are infections generally not detrimental to healthy individuals, but can be life-threatening in people infected with HIV. A person with AIDS and an opportunistic illness that goes untreated has a life expectancy of approximately one year (4).

Getting tested is the only way individuals know they are infected with HIV. Many people infected with the virus display no symptoms for as long as ten years or more. The Centers for Disease Control and Prevention (CDC) currently estimates that 1 in 6 people in the United States infected with HIV do not know they have the virus and therefore recommends that everyone between the ages of 13-64 get tested at least once as part of a regular health screening. The CDC further recommends that all pregnant women be tested early in their pregnancy, via an "opt-out" testing measure – which is when pregnant women are told that an HIV
test will be included in the standard group of prenatal tests and that they may decline the test. Unless the HIV test is specifically declined, they will be tested for the virus. (7)

An early diagnosis in pregnant women can reduce the transmission of HIV in babies to 2%, if the expectant mother (8):

- Receives Active Antiretroviral Therapy (ART) during pregnancy, labor, and delivery.
- Delivers the baby by cesarean, or C-section.
- Avoids breastfeeding.

There is a 20% chance of transmission if the HIV positive, expectant mother does none of the prevention measures listed above (8). In addition, women living in certain geographic areas or women considered high risk, such as those with sexually transmitted infections, multiple partners, or have substance abuse issues, are encouraged to be retested in the third trimester, preferably when less than 36 weeks pregnant (9).

PrEP (Pre-Exposure Prophylaxis) is a daily pill containing two medicines (tenofovir and emtricitabine), recommended for HIV negative people who are at substantial risk of becoming infected with HIV. PrEP, when taken consistently, reduces HIV transmission by up to 92%, and is recommended for (10):

- Individuals in an HIV discordant relationship in which one partner is HIV positive and the other partner is HIV negative.
- Heterosexual women who do not regularly use condoms with sex partners of unknown HIV status.
- Women who share injectable drug paraphernalia or were in treatment for injectable drug use in the past six months.

** Extensive listing of opportunistic illness can be found at: http://womenshealth.gov/hiv-aids/opportunistic-infections-and-other-conditions/.

HIV/AIDS and Nutrition: Dietary needs for an HIV positive individual are determined by the presence of symptoms (11, 12). **Symptomatic** individuals experiencing unintended weight loss, or wasting, and are dealing with: 1) poor food intake due to medication side effects, sore mouth, or mental health issues; 2) altered metabolism due to disease progression; or 3) nutrient malabsorption caused by gastrointestinal problems resulting from medications or just the presence of the virus. In symptomatic participants, the main goals are to: 1) increase or maintain a normal body weight; 2) retain or increase lean body mass; and 3) ensure adequate intake of macro- and micronutrients. In most cases, these individuals usually require diets higher in protein and potentially a multivitamin, as vitamins A, B_6, C, and E are lower in symptomatic people. In instances when wasting cannot be alleviated through regular dietary means, enteral and parenteral nutrition therapy may be necessary. For **asymptomatic** individuals or those with a stable weight, the goals should focus on adequate intake of nutrients to prevent wasting – and if food intake is low, these individuals could potentially include a multivitamin or mineral supplement to avoid deficiencies (11, 12).

It is important to note that taking large amounts of iron supplements, leading to iron-overload, encourages disease progression from HIV to AIDS, and should be avoided. In addition, Vitamin A and Zinc, in the form of supplements, can have a negative impact on adults living with HIV/AIDS (12). Participants should always consult with their health care providers before taking dietary supplements over the Recommended Dietary Allowance to prevent adverse reactions and interactions with medications used to treat HIV/AIDS. (13)

HIV/AIDS Medication Nutritional Problems: Even though people with HIV are able to manage the disease and live longer with Highly Active Antiretroviral Therapy (HAART), the side effects can have a negative impact on a person's nutritional status. Common side effects include: gastrointestinal problems, lipid disorders, and insulin resistance/glucose intolerance. Participants experiencing these problems should: reduce total fat intake and cholesterol; increase dietary fiber; increase physical activity; reduce alcohol consumption; and reduce the consumption of simple sugars. (11, 12)

HIV/AIDS and Food Safety: Participants living with HIV are more susceptible to contracting a food-borne illness due to weakened immune systems and therefore should be encouraged to: store and prepare foods safely; check expiration dates; and avoid raw or semi raw foods, such as meat, non-pasteurized dairy, and soft cheeses (11, 12). Infants born to HIV positive mothers, regardless of their HIV status, should drink ready-to-feed or liquid concentrate infant formula as powdered infant formula is not sterile and may not be microbiological safe (14).

HIV/AIDS Care and Support: HIV-affected families often experience a lack of financial and psychosocial support needed to deal with an HIV/AIDS diagnosis, including the effects of social stigma which negatively impacts their ability to comply with the medical treatment needed to control the disease (15). Further, to fully benefit from current treatment protocols required to manage HIV and reduce the progression to AIDS, infected individuals who know their status, must get care, stay in care, and adhere to an effective antiretroviral treatment plan known as an HIV/AIDS Care Continuum (16). WIC agencies should proactively refer participants to health care services and various community resources, including other FNS nutrition assistance programs, to improve health outcomes among HIV-infected WIC participants.

Implications for WIC Nutrition Services

WIC can improve the management of chronic infectious diseases through WIC foods, nutrition education, counseling, and referrals to community resources that provide support in the long-term management of chronic infectious diseases.

HIV/AIDS

The table below summarizes the WIC Nutrition Services that can help improve the health and birth outcomes of participants with HIV/AIDS.

Participant Category	WIC Nutrition Services Recommendations for HIV/AIDS
ALL CATEGORIES	NUTRITION AND HEALTH TIPS TO MANAGE HIV/AIDS SYMPTOMS (12, 17, 18, 19) • Use MyPlate as the guide for dietary needs. • Consult health care providers when using supplements and herbs to avoid adverse reactions or medication interactions that could reduce effectiveness. • Eat small, frequent meals when gastrointestinal problems are present or persistent. • Eat soft foods with manageable textures at tolerable temperatures when oral lesions and dental problems are present (i.e. mashed potatoes, scrambled/boiled eggs, bananas, non-citrus juices, puddings, custards, milk, cooked vegetables, rice, oatmeal, non-fizzy drinks, cottage cheese, non-spicy foods). • Add canned tuna, beans, cheese, peanut butter, dried milk for inexpensive extra protein. • Add moderate amounts of concentrated sources of calories to diet when needed (e.g., butter, cream cheese, gravy, whole milk, ice cream). • Consume nutritious, high caloric foods when appetite is normal or has returned. • Drink adequate water to stay hydrated, replace fluid loss from diarrhea and vomiting, and help medications move through the body. • Consume foods high in fiber or fiber supplements to slow digestion if foods are moving too quickly through the body. • Eat yogurt or foods with *Lactobacillus acidophilus* culture to help with bacterial over-growth resulting from prolonged use of antibiotics. • Avoid caffeinated beverages to prevent dehydration. • Avoid or reduce sugar-free foods with sorbitol as diarrhea may be exacerbated. • Consult with health care provider about use of complete oral nutritional supplements to help nutritional status. • Avoid alcohol and illegal drugs for overall good health and to help protect the liver. • Use pancreatic enzymes when medically prescribed to help with digestion. • Prepare and store food safely.

Participant Category	WIC Nutrition Services Recommendations for HIV/AIDS
WOMEN	• Encourage all women to be tested to prevent mother-to-child HIV transmission through delivery and breastfeeding (7). Women who are considered high risk, such as those with sexually transmitted infections, multiple partners, or have substance abuse issues, are encouraged to be retested during late gestation, preferably before 36 weeks (9). Note: HIV testing is not a standard medical test administered to pregnant women in many states, in addition, pregnant women can opt-out in those states in which HIV testing is part of the standard test. Therefore, WIC can impact the spread of HIV/AIDS by making referrals to participants for early and late gestation testing, given that some populations served by WIC are most at risk for contracting HIV (7). • Advise infected pregnant women to consume a diet adequate in nutrients, achieve appropriate weight gain, and discuss taking a multivitamin with their health care provider (11). • Educate mothers with HIV/AIDS to avoid breastfeeding. This is especially important for recent immigrants and refugees from developing nations, as the recommendations are different in developing countries (15). In some developing countries, breastfeeding is encouraged due to the lack of available clean water to prepare infant formula and other sanitation problems). • More information about women and HIV can be found at: o http://www.womenshealth.gov/hiv-aids/ • http://www.cdc.gov/hiv/risk/gender/pregnantwomen/facts/
INFANTS	• Inform mothers/caregivers that formula feeding is the standard for infants born to HIV positive mothers in the United States as breastfeeding is not recommended – especially to the immigrant and refugee population (13). • Ensure that liquid concentrate, or ready-to-feed infant formula, prescribed with medical documentation, is provided to HIV-exposed infants or babies born to HIV positive mothers, even if the infant has tested negative for HIV. Powdered infant formula is not sterile and therefore may not be microbiologically safe for immune-compromised participants (14). • Discourage giving pre-chewed food, regardless of HIV status, as the individual's HIV status, who is pre-chewing the food is unknown (6). • More information about infants and HIV can be found at: http://www.cdc.gov/hiv/risk/gender/pregnantwomen/facts/
CHILDREN	• Discourage giving pre-chewed food, regardless of HIV status, as the individual's HIV status, who is pre-chewing the food is unknown (6) • More information about children and HIV can be found at: http://www.cdc.gov/hiv/risk/gender/pregnantwomen/facts/ • http://aids.gov/hiv-aids-basics/just-diagnosed-with-hiv- aids/overview/children/

VIRAL HEPATITIS

Hepatitis is inflammation of the liver. It is most often caused by viruses, but can also be caused by excessive alcohol consumption, toxins, and medicines such as acetaminophen, as well as other medical conditions linked to liver inflammation (20). Viral hepatitis is caused by a series of viruses labeled A, B, C, D, and E with A, B, and C being the most common forms in the United States. Viral hepatitis A and E are the only forms that are acute and do not become chronic, whereas B, C, and D can both be acute and chronic in nature (20). Regardless of the type of hepatitis, infected individuals with signs of the infection will typically experience anorexia, nausea, vomiting, diarrhea, jaundice, epigastria pain, tiredness, and weakness, all of which affect one's diet and health (21). In addition, darker urine and pale stools may be resent in infected individuals. It is important to note that viral hepatitis is the leading cause of liver cancer and the most frequent need for liver transplants in the United States (22).

Hepatitis B is both acute and chronic, and is transmitted through contact with hepatitis B virus (HBV) infected blood, sexual intercourse with an infected person, and from mother to child by both vaginal or cesarean section births (20). Those at higher risk of becoming infected with hepatitis B are those: living with a hepatitis B infected person**;** coming into contact with blood, needles, or body fluids through work**;** working or living in a prison system**;** from Asian and Pacific Islands nations**;** undergoing kidney dialysis**;** infected with HIV or hepatitis; and who have an immigrant or refugee status (21).

Treatment for Hepatitis B involves the use of interferon and antiviral drugs to interfere with the course of the virus. Early diagnosis and treatment of hepatitis B can help prevent damage to the liver. In addition, the Hepatitis B vaccination can prevent Hepatitis B. (22)

Hepatitis B is not spread through human milk. Given that Hepatitis B is spread through blood, mothers who breastfeed should care for their nipples to avoid cracking and bleeding. If a mother with Hepatitis B has cracked and bleeding nipples, she should temporarily stop breastfeeding until her nipples heal - but continue to pump and discard pumped milk to maintain her milk supply (23). If a mother with HBV has concerns with providing her milk to her infant or concerns with drug treatment for the HBV, she should consult her physician.

Hepatitis C: Hepatitis C is both acute and chronic; however, most cases are chronic and commonly spread through sharing needles during intravenous drug use (20). It can also spread through sexual intercourse; having a blood transfusion or organ transplant before July 1992; or using the razor, toothbrush, or nail clippers of an infected person. Being infected with a sexually transmitted disease or HIV can increase the chances of becoming infected with Hepatitis C. Getting tattoos and body piercings from unlicensed facilities, in casual settings, or with the use of non-sterile instruments can also transmit Hepatitis C (20).

By the time symptoms appear with hepatitis C, the liver has been damaged, which in most cases can be as long as ten years after being infected. There is no vaccine for Hepatitis C. Medicines are used to slow or stop the virus from damaging the liver in chronic hepatitis. Severe damage to the liver leading to failure may require a liver transplant. (20)

Infants born to mothers with hepatitis C can become infected; however, breastfeeding is not contraindicated, as Hepatitis C is not transmitted through human milk, unless the mother's nipples are cracked and bleeding. (See information above in **Hepatitis B** about breastfeeding with cracked and/or bleeding nipples.)

Hepatitis D: Hepatitis D is both acute and chronic. Though not common in the United States, viral hepatitis D can only be contracted when an individual also has hepatitis B (20, 22). The virus is present in blood and other body fluids of infected persons and is most commonly transmitted through: engaging in

sexual activity; mother to child during delivery; sharing injection drug paraphernalia, razors, or toothbrushes; or coming in direct contact with the blood of an infected person. Chronic hepatitis D resulting from a super- infection, in which an individual has chronic hepatitis B, can progress to end-stage liver diseases (cirrhosis) or liver cancer. In some patients, interferon may be useful for treating hepatitis D. Although no vaccine exists for Hepatitis D, it can be prevented in persons who do not have Hepatitis B, by getting the Hepatitis B vaccination (20, 22).

Implications for WIC Nutrition Services

WIC can improve the management of chronic infectious diseases through WIC foods, nutrition education, counseling, and referrals to community resources that provide support in the long-term management of chronic infectious diseases.

HEPATITIS

The table below summarizes the WIC Nutrition Services recommendations that can help improve the health outcomes of participants with Hepatitis.

Types of Hepatitis	WIC Nutrition Services Recommendations for Chronic Hepatitis
All Types	• Recommend testing to pregnant women and high risk individuals. • Encourage abstinence from alcohol. • Provide information on high calorie, high protein and moderate fat diets. • Recommend high calorie consumption at breakfast to mitigate nausea. (Typically, nausea is less common in the morning.) • Recommend a consultation with health care provider, consumption of high calorie and protein liquid formula between meals to boost calorie intake. • Encourage a bland diet with extra fluids depending on the severity of nausea and vomiting.
Hepatitis B	• Encourage the Hepatitis B vaccine for all newborns, previously unvaccinated adolescents through the age of 18, and high-risk adults. • Promote breastfeeding as being safe, but to avoid breastfeeding when nipples are cracked and bleeding – at which time, mothers should pump and discard milk to maintain supply. • Discourage the practice of pre-chewing food for infants, as blood May be present.
Hepatitis C	• Promote breastfeeding as being safe, but to avoid breastfeeding when nipples are cracked and bleeding – at which time, mothers should pump and discard milk to maintain supply.
Hepatitis D	• Recommend Hepatitis B vaccine.

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

353 Food Allergies

Definition/Cut-Off Value

Food allergies are adverse health effects arising from a specific immune response that occurs reproducibly on exposure to a given food (1).

This risk is assigned upon the presence of a food allergy diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Note: Risk criteria 353 only applies to food allergies and should not be assigned to those who have non-immunologic adverse reactions to food. See Clarification section for more information.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding*	I	N
Not Breastfeeding	III, IV, V, or VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Food allergies are a significant health concern as they can cause serious illness and life-threatening reactions. Prompt identification and proper treatment of food allergies improves quality of life and nutritional well-being. The actual prevalence of food allergies is difficult to establish due to variability in definitions and study designs. Studies of large, nationally representative samples suggest that 5.8% of children (ages 0-17) and 6.2% of adults have a food allergy based on a clinician's diagnosis and/or the severity of reported symptoms (2,3). These estimates do not include food intolerances or other non-immunologic reactions to food. Perceived food allergy prevalence in these studies was 19% among adults and 11.4% among children, suggesting that more access to testing and counseling is needed (2,3).

Common Food Allergens

Although reactions can occur from the ingestion of any food, a small number of foods are responsible for most food-induced allergic reactions (4). The foods that most often cause allergic reactions are listed below with their prevalence among all U.S. children and adults:

	Children (2)	**Adults (3)**
Any food allergy	7.6%	10.8%
Peanuts	2.2%	1.8%
Cow's milk	1.9%	1.9%
Shellfish	1.3%	2.9%
Tree nuts	1.2%	1.2%
Eggs	0.9%	0.8%
Fish	0.6%	0.9%
Wheat	0.5%	0.8%
Soy	0.5%	0.6%
Sesame*	0.2%	0.2%

*As of January 1, 2023, sesame was officially recognized as the 9th major food allergen in the United States and is required to be identified on food labels.

For many individuals, food allergies appear within the first two years of life. The majority of allergies to cow's milk, eggs, wheat and soy resolve in early childhood. In contrast, allergies to peanuts and tree nuts typically persist to adulthood. Adults may have food allergies continuing from childhood or may develop food allergies after childhood, which usually continue through life (5,6).

When a person has an allergy to one food, they tend to be allergic to similar foods within a food group. For example, all shellfish are closely related; if a person is allergic to one shellfish, there is a strong chance that person is also allergic to other shellfish. The same holds true for tree nuts, such as almonds, cashews, and walnuts (1).

Food Allergies vs. Non-Immunologic Adverse Reactions to Food

Food allergy reactions occur when the body's immune system responds to a food as if it were a threat. However, not all adverse reactions to food are caused by food allergies. Some are caused by "non-immunologic adverse reactions to food," which includes a wide range of disorders related to the consumption of foods (these reactions are often referred to as food intolerances, however this term is often misused, so it is not preferred) (7). Non-immunologic adverse reactions to food are often misdiagnosed as food allergies because the symptoms can be similar. However, unlike food allergies that trigger an immune response that may result from exposure to even small traces of a food allergen, non-immunologic adverse reactions to food do not involve the immune system and are typically dose-dependent (7). The National Institute of Allergy and Infectious Disease (NIAID) separates non-immunologic adverse reactions to food into four categories, including Metabolic, Pharmacologic, Toxic, and Idiopathic / Undefined (1,7), as follows:

1. Metabolic - A reaction is caused by an inability to metabolize a food component. For example, the most common non-immunologic adverse reaction to food is lactose intolerance and is caused by a deficiency in the enzyme lactase, which is necessary in the metabolism of lactose, a type of sugar found in dairy products. (For more information see nutrition risk criterion #355, Lactose Intolerance.)
2. Pharmacologic - A reaction caused by the consumption of a food or food additive that results in drug-like pharmacologic effects. For example, overconsumption of caffeine can cause undesirable symptoms for some individuals such as nervousness, insomnia, headaches, nausea, and diarrhea (8).

3. Toxic - A reaction caused by a toxin found in a food. For example, consumption of fish in the Scombridae family (e.g., tuna, mackerel, bonito, etc.) can cause scombroid fish poisoning or histamine fish poisoning if the fish contains high levels of histamine (9).
4. Idiopathic / Undefined - There are some reactions for which there has yet to be a defined mechanism for the resulting symptoms. For example, many individuals claim to have a hypersensitivity to monosodium glutamate (MSG), and report a myriad of symptoms including headaches, numbness, dizziness, heart palpitations, chest pain and back pain (10). However, decades of research have yet to prove a definitive link between these symptoms and the consumption of MSG (11). Some research suggests that those diagnosed with Irritable Bowel Syndrome (IBS) may have some of their symptoms associated with undefined non-immunologic adverse reactions to food including wheat (e.g., non-celiac wheat sensitivity (NCWS)) and foods high in fermentable oligo-, di-, and mono-saccharides and polyols (FODMAPs) (12).

See clarification section for more information about assigning risks for these reactions to foods.

IgE vs Non-IgE Mediated Allergic Reactions to Foods

There are several types of immune responses to foods, including immunoglobulin E (IgE)-mediated, non-immunoglobulin E (non-IgE)-mediated or mixed.

The most common types of food allergies involve IgE-mediated responses. In an IgE-mediated response, the immune system produces allergen-specific IgE antibodies (sIgE) when a food allergen first enters the body. Upon re-exposure to the food allergen, the sIgE identifies it and quickly initiates the release of chemicals, such as histamine (13). These chemicals cause various symptoms based on the area of the body in which they were released. These reactions typically occur within minutes up to a couple of hours after ingestion and include symptoms such as urticaria (hives), angioedema (swelling), wheezing, cough, nausea, vomiting, hypotension (low blood pressure) and anaphylaxis (6).

Food-induced anaphylaxis is the most severe form of IgE-mediated food allergies. It often occurs rapidly, within seconds to a few hours after exposure, and is potentially fatal without proper treatment (often including the use of epinephrine). Food-induced anaphylaxis often affects multiple organ systems and produces many symptoms, including difficulty breathing, swelling and reduced blood pressure (14). Tree nuts, peanuts, milk, egg, fish, and shellfish are the leading causes of food-induced anaphylaxis (1). Prompt diagnosis and avoidance of allergens is essential to prevent life-threatening reactions.
Non-IgE-mediated allergic reactions to foods are generally delayed in onset, occurring more than 2 hours after ingestion, are more chronic in nature, and primarily affect the skin and/or gastrointestinal system (6). Celiac Disease (Risk 354) is one example of a non-IgE mediated allergic reaction to food. Other less common examples, which fall under Risk 353: Food Allergies, are found in the table below.

Examples of Non-Ige mediated allergic reactions to foods:

Condition	Brief Description
Food protein-induced enterocolitis syndrome (FPIES)	FPIES is a gastrointestinal food hypersensitivity that manifests as episodes of severe vomiting and diarrhea. It can lead to acute dehydration, changes in blood pressure and body temperature, pallor, and lethargy. If chronic and undiagnosed, it can cause weight loss or failure to thrive (Risk 134). FPIES is commonly misdiagnosed initially as a severe stomach illness because the symptoms are so similar. Though any food can trigger FPIES, the most common triggers are cow's milk, soy, rice, and oats. Management involves strict avoidance of the triggering food. Most cases resolve by age 5 (15,16).
Food protein-induced allergic proctocolitis (FPIAP)	FPIAP is a food allergy that manifests as bloody stools, typically within the first few weeks of life. The most common food that triggers FPIAP is cow's milk. Symptoms typically resolve with elimination of cow's milk and soy protein. Cases often resolve around 12 months of age (17,18).

Food protein-induced enteropathy (FPE)	FPE (sometimes referred to as cow's milk-sensitive enteropathy) involves injury to the small intestine when cow's milk is present in the diet (19). Symptoms typically present as protracted diarrhea within weeks of introducing cow's milk protein and resolve when cow's milk is avoided. Other food proteins, such as soybean, wheat, and egg, can also cause FPE. More than half of infants with FPA also have vomiting and failure to thrive, and some may have malabsorption, abdominal distention and early satiety. Blood stools are usually absent (16, 20, 21).

Prevention

There is no evidence that pregnant or breastfeeding women should restrict any foods to prevent the development of allergies in their offspring (22). There is also no evidence to suggest that exclusive breastfeeding is associated with the prevention of any specific food allergies among breastfed infants (23). However, exclusive breastfeeding for the first 3-4 months has been shown to decrease the risk of eczema1 in the first 2 years of life, a condition which has been associated with the development of food allergies (24). There are currently no published trials that compare the timing of the introduction of allergenic foods on the development of food allergy in exclusively formula-fed versus exclusively breastfed infants (22).

The American Academy of Pediatrics (AAP) recommends that all infants, including those with a family history of food allergies, be exclusively breastfed until 6 months of age, unless contraindicated for medical reasons, and continue breastfeeding as long as mutually desired by mother and child for two years or more (22,25). For infants who cannot be exclusively breastfed, there is not currently a specific formula that is recommended to prevent food allergy. Past recommendations to feed hydrolyzed formulas or soy formulas to prevent food allergies in high-risk infants who cannot be exclusively breastfed are not supported by current research (26-30).

Previous research suggested a benefit of the delayed introduction of highly allergenic foods to high-risk infants and children. However, this advice on the introduction of potentially allergenic food was modified in 2008 when new research failed to find any benefit regarding the delayed introduction of allergenic foods to at-risk infants and children (22, 31-33). Additional research has even suggested that the early introduction of allergenic foods may help to prevent the development of allergies to the foods offered among both the general population as well as high-risk populations (34-39). It is also important to note that exclusion diets should not be advised in the treatment of children with eczema unless there is a clinical history of IgE-mediated allergic reactions. Unjustified elimination of a specific food can be harmful and lead to loss of tolerance to the food, with high rates of anaphylaxis when reintroduced (40). Currently, the strongest evidence for recommendations regarding the benefits of introducing potentially allergenic foods has been derived from research on peanuts and eggs. As a result, the AAAAI recommends the introduction of peanut-containing products and egg or egg-containing products to all infants, irrespective of their relative risk of developing peanut allergy, starting around 6 months of life. The AAAAI also recommends not deliberately delaying the introduction of other potentially allergenic foods (cow's milk, soy, wheat, tree nuts, sesame, fish, shellfish) once the introduction of solid foods has begun (23).

Introduction to potentially allergenic foods can occur at home when the infant is developmentally ready for complementary food introduction, in accordance with the family's cultural practice, but not before the infant demonstrates developmental readiness with eating a few other common starter foods. While the AAAAI indicates that in-office allergy screening (such as sIgE and skin prick testing) by healthcare professionals is not required prior to offering potentially allergenic foods, irrespective of relative risk, this remains an option to consider for families that prefer to not introduce allergenic foods at home. Once potentially allergenic foods have been introduced, they should continue to be offered (23).

WIC staff should encourage WIC families to speak with their healthcare providers (HCP) to discuss their plans for the introduction of potentially allergenic foods, especially those considered to be at risk of developing food allergies. According to a consensus report from the American Academy of Allergy, Asthma, and Immunology (AAAAI) and the Canadian Society for Allergy and Clinical Immunology (CSACI), infants should be considered "at increased risk" for developing a food allergy (or an additional food allergy) if they have mild or moderate eczema, a family history of atopy (a genetic tendency to develop allergic diseases such as asthma, allergic rhinitis, and eczema) in either parents, or who have already been diagnosed with at least one food allergy. Infants should be considered "at the highest risk" for developing a food allergy if they have severe eczema (23).

[1] Eczema, also referred to as atopic dermatitis (AD), is a common inflammatory skin disorder characterized by recurrent lesions and intense itch. Eczema affects up to 20% of children and 10% of adults. While it can occur at any age, the typical age of onset is between 3 – 6 months (41,42).

Management

Food allergies have been shown to produce anxiety and affect quality of life; however, management strategies can help mitigate these negative outcomes. Food allergen avoidance is the safest method for managing food allergies. HCPs should work closely with families to provide education on food allergen avoidance and emergency management plans that are culturally and age appropriate. This includes education on reading food labels and ingredient lists, communicating allergens with people providing food, and the avoidance of any cross-reactive foods, i.e., similar foods within a food group (see Clarification for more information). Emergency management plans are essential for individuals with severe food allergic reactions, such as anaphylaxis. Nutrition counseling and weight and/or growth monitoring is recommended for all individuals with food allergies to ensure a nutritionally adequate diet (1).

Formula fed infants with a documented allergy to cow's milk protein should be provided with an extensively hydrolyzed protein formula. According to the AAP, soy formulas should not be considered first for infants with a documented allergy to cow's milk protein since approximately 10 to 14% of infants with a cow's milk protein allergy also have a soy protein allergy (43). Infants who are partially breastfed or formula fed, with certain non-IgE mediated allergies, such as FPIES and FPIP, may require extensively hydrolyzed casein or amino acid-based formula. WIC nutritionists should refer infants to their HCP if there is a concern of allergy to a formula and follow recommendations made.

Implications for WIC Nutrition Services

Through participant-centered counseling, WIC staff can assist participants with food allergies in making changes that improve quality of life and promote nutritional well-being while avoiding allergenic foods. Based on the needs and interests of the participant, WIC staff can (as appropriate):

- Refer participants diagnosed with severe asthma, eczema, eosinophilic esophagitis (EoE) and exercise-induced anaphylaxis to a HCP for food allergy evaluation, since food allergies often coexist with these conditions (1).
- Facilitate and encourage the participant's ongoing follow-up with their HCP for optimal management of the food allergy.
- Promote exclusive breastfeeding until six months of age and continuing as long as mutually desired by mother and child for 2 years or beyond (25).
- Provide hypoallergenic formula for participants with appropriate medical documentation, as needed.
- Individually tailor food packages to substitute or remove allergenic foods.
- Educate participants on maintaining adequate nutritional intake while avoiding allergenic foods. Surveys suggest that many individuals with food allergies are allergic to multiple foods. Multiple

food allergies increase the level of effort require to avoid the triggering foods, as well as the risk of malnutrition.

- Monitor weight status and growth patterns of participants.
- Educate participants with food allergies on reading food labels and identifying allergenic foods and ingredients. See resources below:
    - https://www.fda.gov/consumers/consumer-updates/have-food-allergies-read-label
    - http://www.webmd.com/allergies/foodtriggers.
    - https://www.foodallergy.org/resources/how-read-food-label.
- Educate participants with food allergies on planning meals and snacks for outside the home.
- Refer participants with suspected sensitivity to foods to their HCP for an oral food challenge of allergenic foods, as appropriate.
- Establish/maintain communication with the participant's HCP.

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

WIC participants diagnosed with a non-immunologic adverse reaction to food should not be assigned risk code 353. For example, risk code 355 should be assigned for those diagnosed with Lactose Intolerance. Code 360 should be assigned for participant diagnosed with conditions including, but not limited to:

- Irritable Bowel Syndrome (IBS)
- Non-celiac wheat sensitivity (NCWS)
- Scombroid Fish Poisoning / Histamine Fish Poisoning
- Caffeine Toxicity

Food allergies are diagnosed by a HCP by evaluating a thorough medical history and conducting a physical exam to consider possible trigger foods to determine the underlying mechanism of the reaction, which guides testing. Along with a detailed history of the disorder, such as symptoms, timing, common triggers and associations, there are several types of tests that the HCP may use in diagnosing food allergies. These include the following:

- Food Elimination Diet
- Oral Food Challenges
- Skin Prick Test (SPT)
- Allergen-specific serum IgE (sIgE)
- Atopy Patch Test
- Or the use of hydrolysate infant formulas

Diagnosing food allergies is difficult because the detection of sIgE does not necessarily indicate a clinical allergy. Often, more than one type of test is required to confirm a diagnosis.

Justification for High Risk

Not Applicable

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354 Celiac Disease

Definition/Cut-Off Value

Celiac Disease (CD) is an autoimmune disease precipitated by the ingestion of gluten (a protein in wheat, rye, and barley) that results in damage to the small intestine and malabsorption of the nutrients from food. (1). (For more information about the definition of CD, please see the Clarification section)
CD is also known as:

- Celiac Sprue
- Gluten-sensitive Enteropathy
- Non-tropical Sprue

Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

CD affects approximately 1% of the U.S. population (2, 3). CD can occur at any age, and the treatment requires strict adherence to a gluten-free diet for life. CD is both a disease of malabsorption and an abnormal immune reaction to gluten. When individuals with CD eat foods or ingest products containing gluten, their immune system responds by damaging or destroying villi—the tiny, fingerlike protrusions lining the small intestine. Villi normally allow nutrients from food to be absorbed through the walls of the small intestine into the bloodstream (4). The destruction of villi can result in malabsorption of nutrients needed for good health. Key nutrients often affected are iron, calcium and folate as they are absorbed in the first part of the small intestine. If damage occurs further down the small intestinal tract, malabsorption of carbohydrates (especially lactose), fat and fat-soluble vitamins, protein and other nutrients may also occur (2,5).

In addition to the gastrointestinal system, CD affects many other systems in the body, resulting in a wide range and severity of symptoms. Symptoms of CD may include chronic diarrhea, vomiting, constipation, pale foul-smelling fatty stools and weight loss. Failure to thrive may occur in infants and children. The vitamin and mineral deficiencies that can occur from continued exposure to gluten may result in conditions such as anemia, osteoporosis and neurological disorders such as ataxia, seizures and neuropathy.

Individuals with CD who continue to ingest gluten are also at increased risk for developing other autoimmune disorders (e.g., thyroid disease, type 1 diabetes, Addison's disease) and certain types of cancer, especially gastrointestinal malignancies (2).

Continued exposure to gluten increases the risk of miscarriage or having a low birth weight baby and may result in infertility in both women and men. A delay in diagnosis for children may cause serious nutritional complications including growth failure, delayed puberty, iron-deficiency anemia, and impaired bone health. Mood swings or depression may also occur (2, 6).

See Table 1 for Nutritional Implications and Symptoms.

Table 1. Nutritional Implications and Symptoms of CD

Common in Children

Digestive Symptoms-more common in infants and children, may include:
- vomiting
- chronic diarrhea
- constipation
- abdominal bloating and pain
- pale, foul-smelling, or fatty stool

Other Symptoms:
- Delayed puberty
- Dental enamel abnormalities of the permanent teeth
- Failure to thrive (delayed growth and short stature)
- Weight loss
- irritability

Common in Adults

Digestive Symptoms- same as above, less common in adults

Other Symptoms- adults may instead have one or more of the following:
- unexplained iron-deficiency anemia
- other vitamin and mineral deficiencies (A, D, E, K, calcium)
- lactose intolerance
- fatigue
- bone or joint pain
- arthritis
- depression or anxiety
- tingling numbness in the hands and feet

• seizures • missed menstrual periods • infertility (men and women) or recurrent miscarriage • canker sores inside the mouth • itchy skin rash- dermatitis herpetiformis • elevated liver enzymes
Sources: Case, Shelley, Gluten-Free Diet, A Comprehensive Resource Guide, Case Nutrition Consulting Inc., 2008. National Institute of Diabetes and Digestive and Kidney Diseases, Celiac Disease, NIH Publication No. 08-4269 September 2008.) http://digestive.niddk.nih.gov/ddiseases/pubs/celiac/#what. Accessed May 2012.

The risk for development of CD depends on genetic, immunological, and environmental factors. Recent studies suggest that the introduction of small amounts of gluten while the infant is still breast-fed may reduce the risk of CD. Both breastfeeding during the introduction of dietary gluten and increasing the duration of breastfeeding were associated with reduced risk in the infant for the development of CD. It is not clear from studies whether breastfeeding delays the onset of symptoms or provides a permanent protection against the disease. Therefore, it is prudent to avoid both early (<4 months) and late (≥7 months) introduction of gluten and to introduce gluten gradually while the infant is still breast-fed, as this may reduce the risk of CD. (7)
The only treatment for CD is a gluten-free diet. Individuals with CD should discuss gluten-free food choices with a dietitian or physician that specializes in CD. Individuals with CD should always read food ingredient lists carefully to make sure that the food does not contain gluten. Making informed decisions in the grocery stores and when eating out is essential for the successful treatment of the disease (5, 8).

Implications for WIC Nutrition Services

Through client-centered counseling, WIC staff can assist participants with CD in making gluten-free food choices that improve quality of life and promote nutritional well-being. WIC can provide nutrition education/counseling on alternatives to gluten-containing food products as well as provide gluten-free grain selections available in the WIC food packages. Based on the needs and interests of the participant, WIC staff may (as appropriate):

- Promote breastfeeding throughout the first year of life, with exclusive breastfeeding until 4-6 months of age.
- In consultation with the guidance of a medical provider, introduce gluten-containing foods between 4 and 6 months to infants at risk of CD, including infants with a parent or sibling with CD.
- Tailor food packages to substitute or remove gluten-containing foods.
- Educate participants on meeting nutritional needs in the absence of gluten-containing foods.
- Encourage high fiber, gluten-free grain selections.
- Monitor participant’s growth pattern and weight status.
- Educate participants on planning gluten-free meals and snacks for outside the home.

- Provide educational materials outlining allowed foods and foods to avoid, for example:
  - http://www.celiac.nih.gov/Default.aspx. Accessed May 2012.
  - http://www.naspghan.org/user-assets/Documents/pdf/diseaseInfo/GlutenFreeDietGuide-E.pdf. Accessed May 2012.

- Provide referrals as appropriate.

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

The 2006 American Gastroenterological Association (AGA) Institute Technical Review on the Diagnosis and Management of Celiac Disease refers to CD as "a unique disorder that is both a food intolerance and autoimmune disorder" (9). According to the 2010 NIAID-Sponsored Expert Panel definition, CD is a non-IgE mediated food allergy (10). (See nutrition risk criterion #353, *Food Allergy*.) However, the Expert Panel did not include information about CD in its report but rather refers readers to existing clinical guidelines on CD, including the AGA Institute's Technical Review. (5 9,10)

Justification for High Risk

Not Applicable

References

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355 Lactose Intolerance

Definition/Cut-Off Value

Lactose intolerance is the syndrome of one or more of the following: diarrhea, abdominal pain, flatulence, and/or bloating, that occurs after lactose ingestion.
Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Lactose intolerance occurs because of a deficiency in the levels of the lactase enzyme (1). Many variables determine whether a person with lactase deficiency develops symptoms. They include: the dose of lactose ingested; the residual intestinal lactase activity; the ingestion of food along with lactose; the ability of the colonic flora to ferment lactose; and the individual sensitivity to the products of lactose fermentation (1). Some forms of lactase deficiencies may be temporary, resulting from premature birth or small bowel injuries, and will correct themselves, leaving individuals with the ability to digest lactose sufficiently (2). Primary lactase deficiency is attributable to relative or absolute absence of lactase that develops in childhood and is the most common cause of lactose malabsorption and lactose intolerance (2). Secondary lactase deficiency is one that results from small bowel injury, such as acute gastroenteritis, persistent diarrhea, or other causes that injure the small intestine mucosa, and can present at any age, but is more common in infancy. Treatment of secondary lactase deficiency and lactose malabsorption attributable to an underlying condition generally do not require elimination of lactose from the diet. Once the primary problem is resolved, lactose-containing products can be consumed normally. (2) Congenital lactase deficiency is a rare disorder that has been reported in only a few infants. Affected newborn infants present with intractable diarrhea as soon as human milk or lactose-containing formula is introduced. (2)

Developmental lactase deficiency is the relative lactase deficiency observed among pre-term infants of less than 34 weeks gestation (2). One study in preterm infants reported benefit from the use of lactase-

supplemented feedings or lactose-reduced formulas (3). The use of lactose-containing formulas and human milk does not seem to have any short- or long-term deleterious effects in preterm infants (2).

Lactose is found primarily in milk, milk-based formula and other dairy products, which provide a variety of nutrients essential to the WIC population (calcium, vitamin D, protein). Lactose intolerance varies according to individuals. Some individuals may tolerate various quantities of lactose without discomfort, or tolerate it when consumed with other foods. Dairy products that are soured, or otherwise treated with bacteria that secrete lactase (e.g., Lactobacillus acidophilus), such as cheese and yogurt, are easier to digest in lactose-intolerant individuals because they contain relatively low levels of lactose. (4)
Many individuals diagnosed with lactose intolerance avoid dairy all together. Also, lactose intolerance has been shown to be associated with low bone mass and increased risk of fracture (5). Inadequate dairy intake increases the risk of metabolic syndrome, hypertension, preeclampsia, obesity and certain forms of cancer, especially colon cancer (6).

Implications for WIC Nutrition Services

It is important to assess participants individually for lactose tolerances and nutrient needs to determine the best plan of action. WIC can provide client-centered counseling to incorporate tolerated amounts of lactose-containing foods and/or other dietary sources of calcium, vitamin D and protein into participants' diets. WIC foods such as cheese, lactose-free milk, soy beverages, tofu, and calcium fortified foods (like juice) can provide these nutrients to participants with lactose intolerance. Based on the needs and interests of the participant, WIC staff can, in addition, also offer the following strategies (as appropriate):

- **Except for infants with congenital lactase deficiency**, promote exclusive breastfeeding until six months of age and continue breastfeeding through the first year. For infants with congenital lactase deficiency, treatment is removal and substitution of lactose from the diet with a commercial lactose-free formula (2).
- Tailor food packages to substitute or remove lactose-containing foods.
- Educate participants on meeting nutritional needs in the absence of lactose-containing foods.
- Educate participants on planning lactose-free/lactose-reduced meals and snacks for outings, social gatherings, school and/or work.

Any WIC participant suspected to have lactose intolerance should be referred to a health care provider for evaluation and appropriate diagnosis (7), if needed (see Clarification for additional information on diagnosing Lactose Intolerance).

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

Lactose malabsorption can be diagnosed with a hydrogen breath test. The test involves having individuals ingest a standard dose of lactose after fasting. Elevated levels of breath hydrogen, which are produced by

bacterial fermentation of undigested lactose in the colon, indicate the presence of lactose malabsorption (1). The hydrogen breath test is not routinely ordered, and instead, patients are frequently asked to assess symptoms while avoiding dairy products for a period of time followed by a lactose product challenge to determine if they are lactose intolerant (7). The demonstration of lactose malabsorption does not necessarily indicate that an individual will be symptomatic

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Explain
  - Lactose intolerance may be secondary to GI upset or illness
- Dietary recommendations to discuss:
  - Avoid foods containing lactose
  - Limit portion size of lactose-containing foods
  - Consume dairy foods with meals (diluted with other foods)
  - Heated milk products may be better tolerated (lactose broken down)
  - Higher-fat dairy foods (ice cream) may be better tolerated, for occasional treats
  - Lactose enzyme tablets are available to take when lactose containing foods are ingested (but are expensive)
  - Try lactose-reduced or lactose-free milks (Lactaid, Dairy Ease)
  - Choose low-lactose foods such as aged hard cheese or yogurt for calcium source
    - Active culture foods such as yogurt help break down lactose
  - Read labels to avoid foods containing milk or lactose such as milk solids, non-fat milk solids, whey, lactose, margarine, sour cream, malted milk, butter, buttermilk
  - Avoid foods that may contain lactose; breads, candy/cookies, cold cuts, hot dogs, bologna, commercial sauces and gravies, cream soups, dry cereals, frostings, frozen breaded fish/chicken, prepared and processed foods, salad dressings containing milk or cheeses, sugar substitutes, chocolate drink mixes, coffee drinks/mixes
  - Kosher foods that contain the word “pareve” or “parve” are acceptable and do not contain milk
  - Creamers do not adequately substitute milk
  - If dairy intake is compromised, include foods rich in calcium, vitamin A & D
  - If participant’s calcium intake is compromised, offer calcium-fortified orange juice by providing the client with a Special Formula/Food letter indicating the client’s need for calcium-fortified orange juice
  - Substitute fruit juice or water in baked products that call for milk
    - Choose recipes that produce a good product since texture may be different
- For infants:
  - If breastfeeding, continue to breastfeed (Breast milk is easily digested and will help with recovery of illness, diarrhea and other symptoms.)
  - If formula fed, use lactose reduced formula

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356 Hypoglycemia

Definition/Cut-Off Value

Presence of hypoglycemia diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Hypoglycemia can occur as a complication of diabetes, as a condition in itself, in association with other disorders, or under certain conditions such as early pregnancy, prolonged fasting, or long periods of strenuous exercise (1).

Symptomatic hypoglycemia is a risk observed in a substantial proportion of newborns who are small for gestational age (SGA), but it is uncommon and of shorter duration in newborns who are of the appropriate size for gestational age (2).

WIC can provide nutrition management that concentrates on frequent feedings to support adequate growth for infants and children (2). WIC can also provide nutrition education to help manage hypoglycemia in women that includes consuming a balanced diet, low carbohydrate snacks and exercise (1).

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Hypoglycemia is a manifestation of disease; is not a disease in itself
- Discuss signs and symptoms of hypoglycemia
    - If the rate of fall of blood glucose is rapid may experience sweating, weakness, hunger, tachycardia (increased heart rate)
    - If the rate of fall of blood glucose is slow (over many hours) may experience headache, blurred vision, incoherent speech, mental confusion
    - If hypoglycemia is prolonged, more serious problems can occur
- If participant experiences symptoms, eat something (e.g. ½ cup juice or milk)
- If hypoglycemia is secondary to disease or other medical condition, follow medical recommendations
- There are many different causes or etiologies
- Signs and symptoms and when they occur may vary
- In infants potential causes of hypoglycemia include:
    - SGA
    - Fetal Growth Restriction
    - mother with Gestational Diabetes
- Dietary recommendations
    - Encourage regular scheduled meals (e.g. 3 meals, 3 snacks)
    - Encourage not to miss meals
- Encourage participant to ask MD about allowed exercise
- If participant is pregnant, discuss with MD feeding plan for newborn
    - Allow mother to breastfeed soon after delivery and frequently thereafter
- If infant is being treated in the hospital, recommend the mother/parents be available for and make arrangements for frequent feedings if medically allowed
    - For breastfed infants - to prevent possible “nipple confusion,” increase milk production, benefits to baby, etc.
    - For formula/bottle fed infants - for bonding and interaction

References

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357 Drug Nutrient Interactions

Definition/Cut-Off Value

Use of prescription or over-the-counter drugs or medications that have been shown to interfere with nutrient intake, absorption, distribution, metabolism, or excretion, to an extent that nutritional status is compromised.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	III, VI, V or VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

There are two general concerns with regard to interactions between nutrients and medications: the impact the nutrient has on the medication and the impact the medication has on nutritional status. Although nutrients can dramatically impact the effectiveness of medications, the focus of this risk is on the impact that medications may have on an individual's nutritional status. The interactions that may occur between medications and nutrients can be physical, chemical, physiologic, and/or pathophysiologic (1).

Over-the-counter and prescription medications may impact nutritional status directly or indirectly. Direct impacts of medications on nutritional status include changes to the following:

• The absorption and the distribution of the nutrient.

• The metabolism of the nutrient.

• The rate at which the nutrient is excreted.

These direct impacts of medications may be severe enough to lead to nutrient deficiency and/or nutrient toxicity, which can then impact bodily systems such as bone formation, immune system function, and energy metabolism. (2)

Indirect impacts of medications on nutritional status include the following:

• Changes to appetite

• Changes to taste and smell

• A dry or sore mouth

• Epigastric distress, nausea, vomiting, diarrhea, and/or constipation

These indirect medication related side-effects can impact the amount and/or variety of foods consumed by the individual and may lead to weight changes and/or the development of nutrient deficiency diseases. Some medications that are known to cause the indirect side-effects listed above include pain medications, such as oxycodone and hydrocodone, and medications to treat cancer. (2)

Research on the overall incidence and prevalence of nutrient and drug interactions remains limited. The following table provides a summary of medications that are commonly used and their associated potential impacts on nutritional status. For a comprehensive list of food and medication interactions, WIC programs should reference resources such as the Physician's Desk Reference or the most current Food Medication Interactions guide.
Additional information on medications can also be found online at:
https://medlineplus.gov/druginformation.html.

Medication	Medication Purpose	Impact on Nutritional Status
Amiloride (Midamor)	Diuretic	May cause loss of appetite, nausea, diarrhea, and vomiting (3) May reduce magnesium excretion (4)
Calcium Carbonate (Tums)	Antacid	May cause vomiting, constipation, and loss of appetite (3) May decrease the absorption of iron, zinc, magnesium, and fluoride (2)
Chlorthalidone (Hygroton)	Diuretic	May cause upset stomach, vomiting, diarrhea, and loss of appetite (3) Increases excretion of zinc (5)
Ciprofloxacin (Cipro)	Antibiotic	May cause nausea, vomiting, stomach pain, and diarrhea Decreases the absorption of zinc (5)
Furosemide (Lasix)	Diuretic	May cause constipation and diarrhea (3) May increase magnesium excretion with chronic use (4)
Lansoprazole (Prevacid) and Omeprazole (Prilosec)	Proton pump inhibitors	May cause constipation, nausea, and diarrhea (3) May reduce iron absorption and lead to suboptimal iron repletion with supplements (6)
Levothyroxine (Synthroid, Levothroid, Levoxly)	Thyroid hormone	May cause diarrhea and vomiting (3) May decrease appetite and weight (2)
Metformin	Antihyperglycemic	May cause diarrhea, indigestion, and constipation (3) May decrease appetite (2) May decrease the absorption of folate and vitamin B12 (2)
Methadone	Analgesic (Opioid)	May cause weight gain (3) May cause dry mouth, nausea, vomiting, and constipation (2)

Ondansetron (Zofran)	Antiemetic, Antinauseant	May cause constipation (3) In rare cases may decrease potassium levels (2)
Phenobarbital	Antiepileptic	May cause nausea and vomiting (3) May decrease vitamin D and vitamin K level (2) Decreases calcium absorption (7) May decrease folate levels (8)
Prednisone	Corticosteroid	May deplete calcium and lead to osteoporosis (9) Calcium and vitamin D supplement recommended with long-term use (2)
Ranitidine (Zantac)	Antiulcer, AntiGERD, Antisecretory	May cause constipation, diarrhea, nausea and vomiting (3) May decrease iron and vitamin B12 absorption (2)
Sertraline (Zoloft)	Antidepressant	May cause nausea, diarrhea, constipation and vomiting (3) May lead to anorexia and decreased weight (2)
Sulfasalazine	Ulcerative Colitis Treatment	May cause diarrhea, loss of appetite and vomiting (3) Decreases folate absorption (8)

Breastfeeding and Medication Use

Breastfeeding is important for promoting the health of both the mother and infant. Medication used in the postpartum period, however, can sometimes pose some challenges to breastfeeding. While many medications are safe to use while breastfeeding, some are not compatible with breastfeeding or should be used with caution. If breastfeeding women require medication, then medications should be chosen that are not contraindicated with breastfeeding, if possible. It is thus very important for the mother to discuss her breastfeeding status and goals with her healthcare provider to determine the best infant feeding and medication plan. Information and recommendations on the use of specific medications while breastfeeding can be found at the National Institutes of Health's LactMed Drugs and Lactation Database (https://toxnet.nlm.nih.gov/newtoxnet/lactmed.htm) and in the most recent version of Hale's Medication and Mothers' Milk. Note that while these resources provide useful information, WIC staff need to refer women to their healthcare provider to discuss the safety of taking specific medications while breastfeeding. For additional guidance on breastfeeding and medication use, please refer to the Food and Nutrition Service's WIC Breastfeeding Policy and Guidance, specifically section 1.4, "When Mothers Should Avoid Breastfeeding".

Justification for High Risk

Not Applicable

Implications for WIC Nutrition Services

For participants who are currently taking a medication with known nutrient interactions, WIC staff can:

• Refer the participant/caregiver to their health care provider or pharmacist to discuss the potential nutrient related side-effects and weight fluctuation of medications they take.

• Encourage improved intake of whole grains, legumes, dairy, lean protein, fruits, and vegetables, as appropriate.

• Inform the participant/caregiver of foods or beverages that provide nutrients that may be impacted by the medication.

• Provide education on nutrient-dense foods (when appropriate), meal frequency, portion sizes, and fluid intake when medications induce poor appetite, nausea, or vomiting.

• Provide education on fiber and fluid intake and physical activity to manage constipation related side-effects.

• Provide education on fluid intake, moist foods, and dental care when medications cause a dry mouth.

• Refer women who are either breastfeeding or planning on breastfeeding to their health care provider to determine the best infant feeding and medication plan.

Additional Resources for WIC Staff:

For information on food and medication interactions:

• Physician's Desk Reference (most recent edition)

• Food Medication Interactions (most recent edition)

• National Institute of Health's Medline Plus Database on Drugs, Herbs and Supplements (https://medlineplus.gov/druginformation.html)

For information and recommendations on the use of medications while breastfeeding:

• Food and Nutrition Service's WIC Breastfeeding Policy and Guidance, specifically section 1.4 "When Mothers Should Avoid Breastfeeding" (https://fnsprod.azureedge.net/sites/default/files/wic/WIC-Breastfeeding-Policy-andGuidance.pdf)

• National Institutes of Health's LactMed Drugs and Lactation Database (https://toxnet.nlm.nih.gov/newtoxnet/lactmed.htm)

• Hale's Medication and Mothers' Milk (most recent edition)

Additional Counseling Guidelines

- Explain the factors associated with drug nutrient interaction
    - All drugs taken by pregnant women can be considered potentially harmful to the fetus
    - Misuse of some drugs during pregnancy can result in fetal malformations
    - Food components affect drug absorption and bioavailability (Effects vary for each drug)
    - Drugs can affect the stomach emptying time
    - Drugs can compete with nutrients for absorption
    - Drugs can affect appetite, induce nausea, and impair sense of taste which may reduce food intake and contribute to weight loss
    - Use of some prescription and over-the-counter drugs are not advisable in breastfeeding
    - Some adverse effects can be minimized through adequate nutrient intake and timing of intake in relation to meals and breastfeeding
- Explain possible nutrition related side effects of the medication(s) that participant is currently taking
- Refer participant to her health care provider for the drug nutrient interaction or if a drug nutrient reaction is suspected
- Refer participant to the Mother-to-Baby

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358 Eating Disorders

Definition/Cut-Off Value

Eating disorders are characterized by severe disturbances in a person's eating behaviors and related thoughts and emotions (1). Eating disorders include, but are not limited to:

- Anorexia Nervosa (AN)
- Bulimia Nervosa (BN)
- Binge-Eating Disorder (BED)

Presence of eating disorder diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	Y
Not Breastfeeding	III, IV, V, or VI	Y

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned for pregnant, breastfeeding, and Not Breastfeeding woman

Justification

Eating disorders are caused by a complex interaction of genetic, biological, behavioral, psychological, and social factors (1). They are extremely prevalent in the United States and associated with the highest morbidity and mortality of any mental illness (2, 3, 4).

Comorbidities that commonly occur with eating disorders include anxiety, bipolar disorder, depressive disorders, and substance use disorders (5). If left untreated, eating disorders can be serious and even fatal. Eating disorders are associated with an increased risk of premature death, including from electrolyte disturbances, dehydration, suicide, and alcoholism, among other causes (6). Total annual mortality attributable to eating disorders amounts to 10,200 deaths per year, equating to 1 death every 52 minutes (4).

It is estimated that around 9 percent, or 28.8 million Americans, will have an eating disorder in their lifetime (2, 3, 4). The three most common eating disorders are:

- Anorexia Nervosa (AN) – involves a severe restriction of calories; there may be a fear of weight gain and strict "rules" about eating. AN is a syndrome of self-starvation involving significant weight loss of 15 percent or more of ideal body weight (7).
- Bulimia Nervosa (BN) – involves recurrent episodes of binge eating followed by compensatory behaviors collectively referred to as purging and can include exercise as such a behavior. This could include vomiting or using laxatives or exercising excessively. Patients with BN are, by definition, at normal weight or above (7).
- Binge-Eating Disorder (BED) – involves recurrent episodes of binge eating which are characterized by eating an amount of food that is larger than what most people would eat in a similar period of time under similar circumstances and a sense of lack of control overeating during the episode. Unlike BN, periods of binge-eating are not followed by purging or excessive exercise. As a result, people with binge-eating disorder often are overweight or obese. (5, 8).

In the U.S., BED is the most common type of eating disorder (9). Other less common types of eating disorders include Avoidant/Restrictive Food Intake Disorder and Rumination Disorder (5).

While stereotypically associated with thin, White, affluent females, eating disorders can affect individuals of all ages, races/ethnicities, body weights and genders. Frequently appearing during the teen years or young adulthood, eating disorders may also develop during childhood or later in life. While eating disorders affect both genders, prevalence is higher among women than men (1).

There is a lack of eating disorder research among low-income communities, making it difficult to determine the prevalence, severity, and types of eating disorder pathology among this population (10). However, existing research shows that food insecure adults often deliberately restrict food for reasons other than weight and shape concerns and that this dietary restraint is nonetheless correlated with increased eating disorder pathology (11). Research also supports the notion that increased levels of food insecurity are associated with increased levels of eating disorder pathology (10).

Complications of Eating Disorders during Pregnancy and Postpartum

Research suggests that up to 7.5 percent of pregnant women are affected by an eating disorder (12). It was once thought that pregnancy was rare among women with eating disorders due to associated menstrual dysfunction. Although having an eating disorder can decrease the likelihood of becoming pregnant, a growing body of evidence has confirmed that not only can pregnancy occur during an eating disorder but that it happens more commonly than previously thought (13, 14, 15, 16). Eating disorders have been linked to poor health outcomes for pregnant and postpartum women including depressive symptoms during pregnancy, postnatal depression, and poor infant attachment or maternal bonding (17, 18, 19, 20, 21).

Other misconceptions about eating disorders and pregnancy include the perception that pregnancy motivates eating disorder patients to stop their behaviors; that it will be obvious if a pregnant woman has an eating disorder because she won't gain enough weight; and that as long as weight gain is adequate then eating disorders will not affect the pregnancy or its outcomes (22). Pregnant women with eating disorders may have specific maternal macro- and micronutrient deficiencies (12). When energy and

nutrient stores are low and not sufficiently restored through healthy eating, as in AN, the mother can become severely malnourished which can lead to depression, exhaustion, and many other serious health complications (23). Women with BN who continue to purge during pregnancy are at increased risk of dehydration, chemical imbalances, or even cardiac irregularities (23).

Some women experience an exacerbation of eating disorder symptoms during pregnancy including body image disturbances and abnormal stress from normal pregnancy weight gain whereas other women with eating disorders may experience relief from their symptoms during pregnancy. However, one of the most supported conclusions based on the research is that regardless of whether an eating disorder improves during pregnancy, eating disorder symptoms frequently relapse to their highest level almost immediately after delivery (22).

For women with eating disorders, pregnancies are often unplanned and eating disorder pathology has been associated with various perinatal risks such as delayed development, prematurity, hypotrophy, stillbirth, difficult delivery, and postnatal depression (24). The following table summarizes the health outcomes for both the woman and infant that may result from an eating disorder. Possible Health Outcomes for Women and Infants by Eating Disorder (17, 25, 26, 27, 28, 29, 30, 31, 32, 33)

	Anorexia Nervosa	Bulimia Nervosa	Binge-Eating Disorder*
Health Outcomes for Woman	• Higher risk of cesarean delivery • Hyperemesis • Higher risk of anemia • Antepartum hemorrhage† • Hypertension • Stillbirth • Miscarriage • Malnutrition • Electrolyte imbalance • Fluid imbalance • Bone loss • Changes in brain function	• Higher risk of cesarean delivery • Hyperemesis • Stillbirth • Miscarriage • Malnutrition • Electrolyte imbalance • Fluid imbalance • Postpartum depression • Wearing down of tooth enamel • Heart problems	• Higher risk of cesarean delivery • Gestational hypertension • Gestational diabetes • Bone loss • Heart attack • Stroke • Arthritis • High cholesterol • Miscarriage • Delivery complications • Postpartum depression
Health Outcomes for Infant	• Underweight • Low birthweight • Small-for-gestational-age • Slow fetal growth • Intrauterine growth restriction • Preterm birth • Microcephaly • Perinatal death	• Dehydration • Chemical imbalance • Cardiac irregularities • Microcephaly • Preterm birth • Low birthweight	• Large-for-gestational-age

*Added as a diagnosis to the DSM-5 in 2013, there is limited research on the health outcomes of BED for both the woman and infant.
† Bleeding from the genital tract in the second half of pregnancy (34)

Complications of Eating Disorders while Breastfeeding
Research is inconclusive as to whether eating disorders affect breastfeeding rates. Some research shows that women with a history of eating disorders may be slightly less likely to initiate breastfeeding, whereas other research shows no difference in initiation and cessation of breastfeeding between mothers with and without eating disorders (35, 36, 37). Although there is limited research on the impact of eating disorders on breastfeeding rates, returning to eating disorder behaviors in the postpartum period may result in a shorter duration of breastfeeding and may impact the interaction a mother has with her infant as well as her relationship with her partner (21, 38, 39).

Diagnosis and Treatment
The American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM-5) outlines the diagnostic criteria that must be met to diagnose an eating disorder (5). A person with an eating disorder may display one symptom or many, and a person's appearance may not always display the amount of physical or emotional danger they are experiencing. Someone that appears to be a "healthy weight" can have an eating disorder and need treatment (40). Although there are formal guidelines that professionals use to diagnose eating disorders, as specified in the DSM-5, unhealthy eating behaviors exist on a continuum and the severity of individual criteria are considered in making a diagnosis.

There is no standardized screening for eating disorders during pregnancy and it is uncommon for a medical practitioner to screen pregnant patients for disordered eating symptoms (16, 40, 41, 42, 43). Women are often reluctant to inform medical staff of their struggle with eating disorders, likely the result of anxiety and guilt about harming the fetus (44, 45). Lack of screening and diagnosis has the potential to increase adverse health outcomes for women who do not receive treatment or assistance to address the eating behavior symptoms and/or pathology (46).

Treatment of eating disorders depends on the disorder and symptoms displayed, but typically involves psychological therapy, also known as psychotherapy (47). Depending on the severity of eating disorder symptoms, admission to a specialized residential or hospital-based treatment program can be lifesaving (48). Treatment plans are tailored to the individual's needs, should involve a multidisciplinary team such as a therapist, dietitian, and physician, and may include one or more of the following (1, 49):

- Individual, group, and/or family psychotherapy
- Medical care and monitoring
- Nutritional counseling
- Medications

Additionally, obtaining adequate health insurance coverage for inpatient treatment of eating disorders remains a challenge as one major issue plaguing discussions with insurers regarding reimbursement for the treatment of eating disorders is the apparent gap between research on variables associated with outcomes and the formulas used for reimbursement (50).

Implications for WIC Nutrition Services

The role of WIC is not to diagnose or treat an eating disorder but rather to reinforce and support the medical nutrition therapy that the WIC participant is receiving.

Discussing eating disorders, body weight, weight loss, or weight gain can trigger behaviors associated with eating disorders. Therefore, it is important for WIC staff to be sensitive when discussing eating disorders.

For individuals affected by an eating disorder, staff can (5, 25, 37):

- If available, refer the participant to a health care provider (HCP) with expertise in eating disorders. The participant can work with the provider to create a plan for healthy eating and weight gain.
- Reinforce nutrition counseling/advice that is provided by the eating disorder treatment team/plan.
- Encourage the participant to be honest with their HCP and WIC staff regarding past or present struggles with an eating disorder or disordered eating.
- Encourage the participant to seek or refer the participant to individual counseling and/or support groups during and after pregnancy to help them cope with their concerns and fears regarding food, weight gain, body image, and the new role of parenting.
- Encourage the participant to attend other classes on pregnancy, childbirth, child development, and parenting skills.
- Educate participants that it is important for their prenatal HCP to weigh them as this information is essential to tracking the health of baby.
- When possible, the CPA should coordinate with the participant's HCP to obtain referral data such as height, weight gain, etc. Additionally, encourage the participant to discuss with their HCP about blind weighing (36). If necessary, they can ask their doctor about standing on the scale backwards and instruct them not to share the number with them.
- Encourage the participant to talk to their HCP before attending a prenatal exercise class to make sure it fits with their recovery plan.
- Modify conversation with the participant to avoid topics that are likely to provoke eating disordered behaviors (e.g., topics related to body weight, body shape, and calories).

Clarification

Self-reporting of a diagnosis made by a medical professional should not be confused with self-diagnosis, where a person claims to have or to have had a medical condition without reference to a professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis. Although a self-diagnosis should not be used to assign risk, it should prompt the CPA to make a referral to a healthcare professional for diagnosis and treatment, as appropriate.

An eating disorder is diagnosed based on an individual's symptoms and experiences aligned with criteria defined by the American Psychiatric Association. The term disordered eating is a descriptive phase, not a diagnosis as defined by the American Psychiatric Association. It is possible to have disordered eating patterns that do not fit within the current confines of an eating disorder diagnosis (51). See risk #427-Inappropriate Nutrition Practices for Women to learn more about disordered eating.

Justification for High Risk

Eating disorders can seriously complicate any pregnancy since weight gain is of critical importance and the nutritional status of the pregnant woman is an important factor in perinatal outcome. Pregnant women with an eating disorder are more likely to have a greater rate of miscarriage or premature labor, IUGR, and babies with higher rates of SGA, LBW, neural tube defects, and microcephaly (2). Some women with bulimia before pregnancy transfer to binge eating disorder (BED) during pregnancy. Women with BED and bulimia consume more total energy and fat, monosaturated and saturated fat, yet consume less folate, potassium and vitamin C (3). Pregnant women experiencing anorexia are more likely to have SGA infants and are more likely to relapse postpartum. Other maternal postpartum symptoms like postnatal depression, stress of new motherhood, body image concerns and anemia can contribute to an eating disorder relapse (1). Eating disorders have been linked to poor health outcomes for pregnant and postpartum women including depressive symptoms during pregnancy, postnatal depression, and poor infant attachment or maternal bonding (17,18,19,20,21).

Women with an eating disorder are less likely to breastfeed, or more likely to discontinue breastfeeding before 6 months. If they do breastfeed, mothers with an eating disorder may restrict food from their infants, which will affect the infant's health (2,5). Individual counseling and WIC food can assist the pregnant woman in gaining an appropriate amount of weight and increasing the baby's birth weight.

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References for High Risk

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359 Recent Major Surgery, Physical Trauma, Burns

Definition/Cut-off Value

Major surgery (including cesarean sections), physical trauma or burns severe enough to compromise nutritional status.

Any occurrence:

- Within the past two (≤2) months may be self-reported.
- More than two (>2) months previous must have the continued need for nutritional support diagnosed by a physician or a health care provider working under the orders of a physician.

Participant Category and Priority Level

Category	Priority
Pregnant Women	I
Breastfeeding Women	I
Not Breastfeeding woman	VI
Infants	I
Children	III

Justification

The body's response to injuries such as major surgeries, physical trauma, or burn may adversely affect nutrient requirements needed for recovery, leading to malnutrition. The catabolic response to these injuries causes a hypermetabolic state in the body. This alteration in metabolism not only increases the individual's calorie and protein needs, but they also increase the needs for certain vitamins, minerals, fatty acids, and amino acids. (1)

Proper wound healing is essential in the recovery of surgeries, physical trauma, and burns. Normal wound healing is a complex process and involves three phases: inflammation, proliferation, and remodeling (1, 2). Each phase of wound healing involves growth factors, other biologically active molecules, and specific vitamins and minerals such as Vitamin A, Vitamin C, and Zinc. The process of wound healing does not always follow the three stages sequentially and can sometimes move forward or regress based on nutrition status and response to treatment (3, 4). Even after a wound is closed, the individual's metabolic rate and need for additional nutrition can remain high (5).

Factors that can prevent proper wound healing or can increase the time needed for a wound to heal include (2, 6):

- Malnutrition prior to the surgery, injury or burn
- Infections
- Diabetes
- Poor blood flow
- Obesity
- Age

- Heavy alcohol use
- Stress
- Medications
- Smoking

Because healing is a complex process and is impacted by a variety of factors, it is inappropriate to expect a set recovery time for an individual based solely on the type and severity of the injury (7). For some individuals, they may no longer be at increased nutritional risk within a couple weeks of their injury. For others, recovery from the same type and severity of injury may take months.

Major Surgery and Wound Healing

Many types of surgeries are completed as noninvasive procedures and do not result in large incisions that require additional medical and nutritional care to heal. However, many surgical procedures (including cesarean sections) do involve incisions that, if left unaddressed, could lead to infection. Major surgeries are surgeries that involve a risk to the life of the individual and include operations on organs within the body(8). Removal of a portion of the large or small intestine, heart surgery, and bariatric surgery are examples of major surgeries. Minor surgeries are surgeries that involve little risk to the individual and include operations on the superficial structures of the body (9). Ear tubes, the most common childhood surgery performed with anesthesia, are an example of a minor surgery that does not impact nutrition status (10).

Cesarean sections are considered a major surgery and, therefore, require additional assessment and education in the WIC clinic. In the US, the rate of cesarean delivery rose from 19.7% of singleton births in 1996 to 31.3% of singleton births in 2011 (11). Reasons for a cesarean delivery include multiple pregnancy, labor fails to progress, medical concerns for the infant, problems with the placenta, a large infant, breech position, maternal infections, and medical conditions in the mother (i.e. diabetes or high blood pressure) (12).

Nutritional Considerations for Major Surgery/Wound Healing

The role of specific nutrients in wound healing continues to be explored and studies are conducted regularly to assess the role vitamins, minerals, fatty acids, amino acids, and carbohydrates play in proper wound healing. Nutrient supplements above the Recommended Dietary Allowance (RDA) may be necessary to aid in wound healing. However, before using any additional supplement to assist in wound healing, energy and protein requirements of the individual must be met (13, 14). Amino acids are essential to the repair of damaged tissue in the body. Amino acids are divided into three categories: essential (must be obtained through foods), nonessential (can be produced in the body), and conditionally essential (produced in the body except in cases of injury or illness). Arginine and Glutamine are examples of conditionally essential amino acids.

The following table highlights the roles of these nutrients in the wound healing process:

Nutrient	Role in Wound Healing
Arginine	Involved in secretion of growth hormone (12)
Omega-3 fatty acids	Reduces wound infections (12)
Vitamin C	Collagen synthesis (2)
Vitamin A	Immune function and cellular communication (15)
Vitamin E	Antioxidant (16)
Vitamin D	Modulates cell growth Neuromuscular and immune function Reduces inflammation (17)
Magnesium	Co-factor for enzymes involved in protein and collagen synthesis (2)
Copper	Co-factor for cross-linking of collagen (2)
Zinc	Involved in RNA and DNA polymerase (2)
Iron	Aids in the synthesis of some growth hormones and connective tissue (18)

Following a cesarean section, a breastfeeding mother may experience difficulty finding a comfortable nursing position that does not cause pain with the incision. She may also have difficulty breastfeeding if the infant is drowsy due to the pain medication administered during the procedure. A referral to a lactation specialist can help ensure that the mother is successful in reaching her breastfeeding goals.

Physical Trauma

Physical trauma is usually a result of accidents and injuries that often lead to fractures, wounds, and subsequent hospitalization. Physical trauma can be divided into blunt force trauma, penetrating trauma, and trauma from surgery. Blunt force trauma is the result of an object (or force) striking the body, causing concussions, lacerations or fractures. Penetrating trauma is trauma that occurs as a result of an object piercing the skin, causing an open wound (7). Fracture healing is a process that begins with a hemorrhage and progresses through three stages: inflammatory, reparative, and remodeling.

Physical trauma can also be a result of domestic and/or child abuse. In addition to the physical effects of abuse, victims of abuse often experience acute and ongoing psychological and emotional trauma that may also impact an individual's nutrition status. Poor appetite, undesirable food choices, and using food for coping can impact both women and children. Children may also begin hoarding food in cases of abuse or neglect. For more information on the impact of abuse, see Risk #901 *Recipient of Abuse*.

Nutritional Considerations for Physical Trauma

In addition to an increase in energy, protein, and micronutrients needed for proper wound healing, physical trauma that includes fractures requires additional nutrients for proper bone healing. In some cases, the physical trauma will lead to temporary or lifelong difficulty with self-feeding. Research on the roles specific nutrients play in fracture healing continues to expand. Key nutrients for bone health include calcium, phosphorus, fluoride, magnesium, sodium, vitamin D, vitamin A, vitamin K, vitamin C, vitamin B6, folate, and vitamin B12. Meeting RDAs set for these nutrients is important for bone health and bone healing (19).

For some individuals, intakes above the RDA may be recommended by their medical provider to assist in bone healing; however, some nutrients including fluoride, sodium, and vitamin A may negatively impact bone health when intake is above the recommended level (19).

Burns

Burns can be caused by heat (including hot surfaces, fires, and hot liquids), chemicals, electricity, sunlight or nuclear radiation. There are three stages of burns based on what layers of the skin are burned. A first- degree burn only affects the outer layer of the skin (epidermis). A second-degree burn damages the epidermis and the layer directly under the epidermis (dermis). A third-degree burn damages the epidermis, dermis, and damages the tissue underneath the skin. (20)
Burns are also classified based on the surface area of the body that has been burned (Percent Total Body Surface Area or TBSA). For example, a burn that covers one hand and arm would be 9% TBSA, whereas a burn that covers a person's back would be 18% TBSA (21). Increases in the surface area affected by the burn result in a greater potential for fluid loss and infection (21). Inhalation burns are burns that occur inside an individual's lungs and internal organs. Once discharged from the hospital, enteral feedings may be prescribed to aid in healing.

Nutritional Considerations for Burns

The nutrition status of burn patients is monitored very closely during hospitalization and after discharge. Following a severe burn, the body goes into a catabolic state and the body begins to break down skeletal muscle (5). This state increases the requirements for energy, protein, carbohydrates, fats, vitamins, minerals, and antioxidants (22). Damaged blood vessels also increase fluid loss and can lead to dehydration or shock (19). Nutrition care in the hospital setting for individual's recovering from burns may also include parenteral or enteral nutrition support depending on the severity of the burns. Glutamine, a conditionally essential amino acid, can improve the healing of burns (23).

Implications for WIC Nutrition Services

Most surgeries, physical traumas, and burns are unexpected. The education and supplemental food that WIC provides can help ensure that the individual is in good nutritional health prior to the surgery, physical trauma or burn. Following a major surgery, physical trauma, and/or burn, an individual will be at increased nutritional risk until the injury has completely healed. WIC staff can improve outcomes following an injury by:

- Assuring that vitamin and mineral intakes meet the RDAs (unless amounts that exceed the RDAs are recommended by their medical provider).
- Assuring that energy and protein intake preserve lean muscle mass and body weight.
- Recommending a participant speak with their medical provider about a multivitamin supplement when diet alone cannot meet the RDAs for vitamins and minerals.
- Referring to community resources for smoking cessation, support groups, food assistance, and safe living environments (in cases of physical abuse).
- Referring to a lactation educator if women experience difficulty breastfeeding following a cesarean section.

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360 Other Medical Conditions

Definition/Cut-Off Value

Diseases or conditions with nutritional implications that are not included in any of the other medical conditions. The current condition, or treatment for the condition, must be severe enough to affect nutritional status. This includes, but is not limited to:

- Juvenile Idiopathic Arthritis (JIA)
- Systemic Lupus Erythematosus (SLE)
- Polycystic Ovary Syndrome (PCOS)
- Cardiovascular Disease
- Persistent Asthma (moderate or severe) requiring daily medication
- Cystic Fibrosis (CF)

Presence of medical condition(s) diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	III, IV, V, or VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Juvenile Idiopathic Arthritis (JIA)

In 2001, the International League of Associations for Rheumatology reclassified juvenile rheumatoid arthritis as juvenile idiopathic arthritis (JIA) (1). This was done in efforts to be inclusive of both American and European diagnosis criteria and to improve communication between international healthcare providers and researchers (2). JIA is an umbrella term for all forms of childhood arthritis. It is a systemic disease that results in the destruction of joint tissue due to inflammation (2).
Due to differences in nomenclature, it is difficult to estimate the number of children affected with JIA. In the United States, it is estimated that about 1 in 1000 children develop chronic arthritis, mainly JIA (3). Children with JIA face nutritional impairment due to chronic inflammation, drug side effects, and/or functional difficulties, such as jaw joint stiffness. Nutritional problems often lead to observed lower BMI and smaller height stature among JIA patients (3). While there is no prescribed diet for children with JIA, dietary fats (e.g., omega-3 fatty acids) can influence inflammation (4, 5). More research needs to be done to know if foods rich in omega-3 fatty acids will be helpful. However, these foods have other health benefits, especially in the prevention of heart disease and can be recommended. The best sources of omega-3 fatty acids are from fish such as salmon, sardines, mackerel, herring and tuna. Other omega-3 sources (less potent than fish, however) include ground flax, flaxseed oil, walnuts and, to a limited degree, green leafy vegetables (5).

Systemic Lupus Erythematosus

Systemic lupus erythematosus (SLE) is a chronic inflammatory and autoimmune disease that can affect multiple organ systems, including the skin, joints, kidneys, heart, and central nervous system. The appearance and progression of this disease is highly variable. The most common symptoms include fatigue, loss of appetite and weight, and skin lesions (butterfly rash on face). (6)
The cause of SLE is not fully known. Genetics is thought to play a role in its development. Environmental factors such as exposure to silica dust particles and cigarette smoking as well as use of estrogen-based oral contraceptives or hormone replacement therapy can increase the risk of the disease (6, 7). The role of exposure to ultraviolet light (UV) in the development of SLE is still not known, though it may worsen SLE symptoms (7). There is no cure for SLE but medical interventions and lifestyle changes can help control it (8).

SLE is common with more than 200,000 cases per year in the U.S. (9). While anyone, including children, can develop SLE, it is most common among women of childbearing ages, 15 to 44 years, and women of color (10). Women who have SLE can safely get pregnant and have normal pregnancies and healthy babies. However, they will be considered to have a “high risk pregnancy” due to an increased likelihood of problems arising during their pregnancy (10, 11). High-risk maternal complications include inflammation of the kidneys, gestational diabetes, and pre-eclampsia; while fetal complications include miscarriage, preterm birth, and intrauterine growth restriction (11).

Typical SLE management uses antimalarial drugs, immunosuppressive agents, biological agents, and some adjunctive therapies (6, 12). Mild cases can be controlled with non-steroidal anti-inflammatory drugs or low- dose glucocorticoids, but more severe cases may require more advanced treatment (12). Glucocorticoids can be associated with side effects including osteoporosis, hyperglycemia and may increase the predisposition to obesity, the risk of developing diabetes, hypertension, and cardiovascular disease (CVD) (12).

Diet quality in people with SLE is important because they are at higher risk of CVD, low bone mineral density, and vitamin D deficiency (13, 14). More than half of the people with SLE have three or more risk factors for CVD (mostly obesity, hypertension, and dyslipidemias) (12). A low-calorie diet high in vitamin- and mineral- rich foods and mono and polyunsaturated fatty acids (MUFA/PUFA) may help control the inflammatory aspects of the disease and the complications and co-morbidities resulting from SLE treatment (15). Some studies have highlighted the importance of specific vitamins mainly A, B6, C, D and E, and adequate dietary fiber intake, as well as protein and sodium restriction in reducing co-morbidities and preventing SLE flares (16, 17). For all people with SLE, it remains important to encourage them to stop smoking, avoid being overweight and optimize their blood pressure and lipid profile to decrease cardiovascular risk (13).

Polycystic Ovary Syndrome

Polycystic ovary syndrome (PCOS) is a hormonal disorder common among women of reproductive age. Most women with PCOS produce excess male sex hormones (androgens) and have many small cysts on their ovaries (18). The prevalence of PCOS ranges from 4 percent to 21 percent, depending on the criteria used to make the diagnosis (19). The exact cause of PCOS is unknown, however, insulin resistance is believed to play a role in the pathogenesis of PCOS (20). In addition, there may be a genetic component, since it is not unusual for multiple women in the same family to have PCOS (18).

Hyperandrogenism (excess male sex hormones) may prevent ovulation and can cause irregular menstrual periods, leading to difficulty conceiving a child or a complete inability to conceive (19). PCOS is the most common cause of infertility (19). For those who achieve pregnancy, there is an increased risk of complications and pregnancy loss (19). Women with PCOS are more likely to develop type 2 diabetes, high blood pressure, problems with the heart and blood vessels, uterine cancer, and metabolic syndrome (18, 19).

About half of all women with PCOS are overweight or obese (19). Treatment for PCOS may include medication to promote ovulation, however, weight loss is the primary therapy for PCOS (18, 20). A reduction in weight of as little as 5% can improve insulin resistance associated with PCOS, and for some women it may improve the hormone imbalance and increase fertility (21). WIC nutrition services should focus on dietary and physical activity guidance to promote weight loss and compliance with healthcare provider treatment.

Cardiovascular Disease

Cardiovascular disease (CVD), or commonly known as heart disease, is an umbrella term for several types of heart conditions that cause a decrease flow of blood to the heart which can result in a heart attack (22). The most common type of CVD is coronary artery disease (22). CVD is the leading cause of death for women in the United States and is responsible for about 1 in every 5 female deaths (23). Due to the fact that most CVDs develop slowly over decades as plaque builds up and hardens arteries, cardiac disorders in children are not caused by CVD (24). Children with cardiac conditions typically have congenital heart disease and should be assigned risk 349 *Genetic and Congenital Disorders*. Traditional risk factors for developing CVD include diabetes, smoking, obesity and overweight, physical inactivity, high blood pressure, and high cholesterol (25, 26). Recent discoveries have highlighted differences in how men and women develop and are diagnosed with CVD. Women are more affected by traditional CVD risk factors than men, and some risk factors specific to women go under recognized by their healthcare providers (25, 26).

Women-specific risk factors for CVD are pregnancy and pregnancy-related complications (27). Pre-eclampsia, preterm delivery, gestational diabetes, and polycystic ovary syndrome are all risk factors for CVD (26, 27, 28, 29, 30). If women have any women-specific CVD risk factors, it is recommended to encourage them to discuss their risk for CVD with their healthcare provider.

People with CVD benefit from cardiac rehabilitation which is a program that helps strengthen the heart through physical activity and helps build healthier habits like eating a healthy diet (31). Likewise, a heart healthy diet can prevent the development of CVD, and includes (32):

- Eating high fiber foods
- Eating foods low in saturated fat
- Limiting salt in diet
- Limiting added sugars in diet
- Limiting alcoholic drinks

Asthma

Asthma is a chronic lung disease that causes the airways to become inflamed and narrow (33). Symptoms include wheezing, breathlessness, chest tightness, and coughing of variable severity (34). Asthma attacks may be mild, moderate, or severe enough to become life-threatening events (34).

According to the Centers for Disease Control and Prevention (CDC), asthma affects 25 million people. The prevalence among adults is 7.7%. In children, asthma prevalence is lower among children age 0-4 (3.8%) than older children age 5-19 (9.8%). In addition, asthma is more common in females (9.3%) than males (6.4%). Regarding race and ethnicity, asthma prevalence is higher among Blacks and American Indian or Alaska Natives, 10.7 and 10.4% respectively, compared with Whites (8.0%). Among Hispanics asthma prevalence is 6.5% and among Asians it is 4.5%. Asthma prevalence increases with decreasing annual household income, with the highest prevalence seen in those with incomes less than 100% poverty (11.7%). (35)

In most cases, the cause(s) of asthma is unknown (34). However, people with asthma can reduce the number and severity of asthma attacks by identifying what triggers an attack. Triggers can be different for everyone, but the most common ones include (36):

- Tobacco smoke
- Dust mites
- Air pollution
- Pest (e.g., cockroaches, mice)
- Pet dander
- Plant pollen
- Mold
- Infections
- Exercise
- Strong scents (such as perfumes)

Asthma can't be cured, but its symptoms can be controlled. Treatment includes avoiding the triggers of an asthma attack and medications. There are two types of asthma medicines (36):

- Quick-relief medicines act fast to open up tight airways. They can be used as needed during a flare- up. Quick-relief medicines act fast, but their effect doesn't last long. These kinds of medicines are also called "fast-acting" or "rescue" medicines.
- Long-term control medicines manage asthma by preventing symptoms from happening. They reduce inflammation in the airways, which is the cause of the swelling and mucus. (Quick-relief medicines only treat the symptoms caused by the inflammation.) Long-term control medicines — also called "controller" or "maintenance" medicines — must be taken every day, even when a person feels well.

Inhaled corticosteroids are the most effective and commonly used long-term control medications for asthma. In children, long-term use of inhaled corticosteroids can delay growth slightly, but the benefits of using these medications to maintain good asthma control generally outweigh the risks. (37)

There is no specific diet therapy for asthma, but below are recommendations for reducing symptoms (38):

- Consume a diet to maintain or achieve a healthy weight. Being overweight can worsen asthma. Even losing a little weight can improve symptoms
- Eat plenty of fruits and vegetables. They're a good source of antioxidants such as beta carotene and vitamins C and E, which may help reduce lung inflammation and irritation caused by cell-damaging free radicals.
- Avoid allergy-triggering foods. Allergic food reactions can cause asthma symptoms.
- Consume foods high in vitamin D. People with more-severe asthma may have low vitamin D levels. Milk, eggs, and fish such as salmon all contain vitamin D.

Cystic Fibrosis (CF)

Cystic fibrosis (CF) is a genetic disorder that affects the cells that produce mucus, sweat, and digestive fluids. In people with CF, a defective gene causes these secretions to become sticky and thick. Instead of acting as lubricants, the thick secretions clog ducts and passageways throughout the body, especially in the lungs, pancreas, and intestines. (39)

CF is a rare disease that affects about 35,000 people in the U.S. (40). All babies born in the United States are tested for CF soon after birth as part of newborn screening (40). Early diagnosis is important so that treatment can be started right away, which can help delay or prevent complications of the disorder. CF is a progressive disease and although there have been improvements in screening and treatments, people with CF have a life expectancy of 35 – 40 years, with some living into their 50s (39).

There is no cure for CF. People with CF often experience malnutrition, poor growth, frequent respiratory infections, breathing problems, and chronic lung disease (41). Goals of treatment are to ease symptoms, prevent and treat complications, and slow the progress of the disease (39). Due to the impact of CF on pancreatic enzymes, the digestion and absorption of protein and fats, are greatly impaired (42). Thus, most people with CF must take pancreatic enzymes as well as fat soluble vitamins (A, D, K and E) (42). The focus of nutrition therapy is to ensure adequate intake due to impaired digestion. Nutritional care should be personalized and provided by a specialized CF dietitian, if available, because needs may change dramatically during the progression of the disease (42).

Implications for WIC Nutrition Services

WIC can improve the management of above listed medical conditions through WIC foods, nutrition education, counseling, and referrals to health and community resources. The table below provides additional WIC nutrition services recommendations specific to the disease state:

WIC Nutrition Services Recommendations for Other Medical Conditions	
All Types of Medical Conditions	• Reinforce healthcare provider treatment and dietary plan (if applicable) • Refer for medical nutrition therapy (if available) • Recommend a healthy dietary pattern as described in the Dietary Guidelines for Americans
Juvenile Idiopathic Arthritis (JIA)	• Encourage adequate caloric intake • Monitor growth
Systemic Lupus Erythematosus (SLE)	• Encourage stress-relieving activities to prevent flares • Encourage and refer to smoking cessation if participant is a smoker • Encourage use of sunscreen and sun exposure avoidance • Encourage physical activity as tolerated
Polycystic Ovary Syndrome (PCOS)	• Provide dietary and physical activity guidance to support weight loss, if necessary
Cardiovascular Diseases	• Encourage participant to discuss blood cholesterol and triglycerides with health care provider • Recommend healthy food choices to control overweight or obesity • Recommend limiting alcohol, salt, added sugars, and saturated fat as part of a healthy dietary pattern • Suggest dietary fiber food options (e.g., fruit, vegetables, whole grains, legumes) • Encourage stress-relieving activities • Encourage smoking cessation if participant is a smoker
Asthma	• Provide dietary and physical activity guidance to support weight loss, if necessary

	• Educate on the avoidance allergy-triggering foods if allergies are present
Cystic Fibrosis (CF)	• Provide more frequent growth monitoring • Encourage adequate caloric intake to maintain healthy weight and normal growth

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

Justification for High Risk

Not Applicable

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361 Mental Illnesses

Definition/Cut-Off Value

As defined by the American Psychiatric Association in the Diagnostic and Statistical Manual of Mental Health Disorders, Fifth Edition, a mental disorder (or mental illness)[1] is:

> "A syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. Mental disorders are usually associated with significant distress or disability in social, occupational, or other important activities (1)."

Mental illnesses where the current condition, or treatment for the condition may affect nutrition status include, but are not limited to:

Mental Illnesses	
Depression	Anxiety Disorders
Post-Traumatic Stress Disorder (PTSD)	Obsessive-Compulsive Disorder (OCD)
Personality Disorders	Bipolar Disorders
Schizophrenia	Attention-Deficit/Hyperactivity Disorder (ADHD)

[1]The terms mental disorder and mental illness are both used in the Diagnostic and Statistical Manual of Mental Health Disorders. Mental illness is the term endorsed by Substance Abuse and Mental Health Services Administration (SAMHSA).

Note: For mental illnesses related to eating disorders (e.g., anorexia nervosa, bulimia nervosa and binge-eating disorder), please see risk #358 Eating Disorders.

The presence of a mental illness that is diagnosed, documented, or reported by a physician, or someone working under a physician's orders, mental health provider or as self-reported by an applicant, participant, or caregiver. See Clarification (page 12) for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	III, IV, V, or VI	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Prevalence of Mental Illnesses

In 2019, the prevalence of any mental illness in U.S. adults was 20.6%; one fifth of the adult population (2). Mental illnesses can vary in impact from mild to severe (2). Young adults aged 18-25 had the highest prevalence of mental illnesses (29.4%) (2). Females had a higher prevalence (24.5%) than males (16.3%) (2). Those reporting two or more races had the highest prevalence (31.7%), followed by Whites (22.2%), Alaskan Natives or Native Americans (18.7%), Hispanics (18%), Blacks (17.3%), Native Hawaiians or OtherPacific Islanders (16.6%), and Asians (14.4%) (2). Additionally, people in the Lesbian, Gay, Bi-Sexual, Transgender, Queer (LGBTQ) community experience mental illnesses, especially depression and anxiety disorders, at a higher rate (3). LGB adults are more than twice as likely as heterosexual adults to experience a mental illness while transgender adults are nearly 4 times as likely as cisgender adults to experience a mental illness (3).

The prevalence of severe mental illness in U.S. adults was 5.2% in 2019 (2). Severe mental illness results in serious functional impairment which substantially interferes with or limits one or more major life activities (2). The Americans with Disabilities Act Amendments Act of 2008 defines major life activities as “including but not limited to caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, standing, speaking, breathing, lifting, learning, reading, concentrating, and working” (4). People with severe mental illness often have difficulty maintaining a healthy diet, even when guidance is provided (5). Unintended changes in total body weight (5% in the past month, or 10% in the past six months) and medications that alter appetite or intake, nutrient absorption, or the metabolism of nutrients may signal the need for additional referrals and indicate that the mental illness is more serious (5). Females had a higher prevalence (6.5%) of severe mental illness than males (3.9%) (2). Young adults aged 18-25 years had the highest prevalence of severe mental illness (8.6%) compared to adults aged 26-49 years (6.8%) and aged 50 and older (2.9%) (2). Those reporting two or more races had the highest prevalence of severe mental illness (9.3%), followed by Alaskan Natives or Native Americans (6.7%), Whites (5.7%), Hispanics (4.9%), Blacks (4.0%), Asians (3.1%), and Native Hawaiians or Other Pacific Islanders (2.6%) (2).

The prenatal and postnatal periods are a common time for the relapse of mental illnesses such as depression, bipolar disorder, and anxiety disorders since women may choose not to take their medications while pregnant or breastfeeding. Suicide remains a leading cause of mortality in the postpartum period and accounts for 20% of maternal deaths in the first year after birth. Mental illnesses during pregnancy have been associated with adverse perinatal outcomes, including placental abnormalities, small-for-gestational-age fetuses, fetal distress, preterm delivery, adverse neurodevelopmental outcomes, and disordered attachment. Pregnant women with untreated mental illness are also more likely to smoke, use alcohol and drugs, have less prenatal care, and have poor nutrition. (6)

Children whose parents have a mental illness are at risk for developing social, emotional, and behavioral problems. They are more likely to have an inconsistent and unpredictable family environment which can place the child at risk for poverty, living in a single parent home, hostile behavior by a parent, and having a parent with a substance use disorder. (7)

Mental illnesses or serious emotional disturbances also occur in children. Symptoms in children are observed as serious changes in the way they typically learn, behave, or handle their emotions, which cause distress and problems getting through the day. The diagnosis is often made in the school years or sometimes earlier. Symptoms of mental illnesses often change as a child grows. Mental illnesses can also interfere with a child’s healthy development, causing problems that can continue into adulthood. The most common mental illnesses that are diagnosed in childhood are attention-deficit/hyperactivity disorder (ADHD), anxiety, and behavior disorders, as follows (8):

- 9.4% of U.S. children aged 2-17 years have received an ADHD diagnosis.
- 7.4% of U.S. children aged 3-17 years have a diagnosed behavior problem.
- 7.1% of U.S. children aged 3-17 years have diagnosed anxiety.

- 3.2% of U.S. children aged 3-17 years have diagnosed depression.
- 16.7% U.S. children aged 2–8 years have a diagnosed mental, behavioral, or developmental disorder.

Poverty affects mental health in many ways including increased financial stress, chronic and acute stressful life events, inadequate nutrition, and lead exposure. It can also affect parental relationship stress, result in a low-stimulation home environment, and child abuse and neglect. Poverty in childhood is associated with depressive and anxiety disorders, and higher rates of almost every psychiatric illness in adulthood. Poverty in adulthood is linked to depressive disorders, anxiety disorders, and suicide. (9)

Treatment

Treatment for any mental illness can be complex and depends on the severity of the symptoms (1). It is estimated that only half of individuals with any type of mental illness receive treatment (2). More females receive treatment for mental illnesses than males (2). It is also more common for older adults to receive treatment than those aged 18-25 years old (2).

Mental illnesses are most commonly treated with psychotherapy and medication (1). Medications can play a role in treating most mental illnesses but choosing the right treatment plan should be based on an individual's needs, medical situation, and be under the guidance of a health care professional (10). Certain medications such as antidepressants, antipsychotics, anticonvulsants, or stimulants can influence body weight and appetite (11). Individuals who are prescribed antipsychotics often have weight gain that may result in additional health issues, reduced quality of life, and poor compliance with taking the medication as prescribed (12).

Mental Illnesses and Nutrition

Nutrition is important to mental health because it contributes to maintaining the structure and function of the nerve cells and chemicals in the brain. The production of nerve chemicals or neurotransmitters requires certain nutrients including amino acids, zinc, copper, magnesium, iron, iodine, selenium, and B vitamins. If the intake of these nutrients is low, it can affect the production of neurotransmitters and therefore mental health. While vitamin D is usually associated with bone health it is also a very important nutrient for the brain. Research has associated vitamin D deficiency with mood disorders, dementia, and an increased risk for depression. (12)

Essential fatty acids (EFA) are also crucial nutrients that may support mental health. They are the building blocks for nerve tissue and transmitting nerve signals. When EFA are out of balance or consumed in insufficient amounts, biochemical malfunctions such as incomplete or inaccurate nerve signals can impact physical and mental health. (12)

Some patients with mental illnesses can be deficient in some vitamins, minerals, and nutrients. These commonly include, B6, B9, B12, omega-3 and omega-6 fatty acids, magnesium, vitamin D, and zinc (12). Evidence suggests that in some cases, when these deficiencies are returned to normal, changes in mood and behavior can be achieved. (12)

Common Mental Illnesses

Depression

Depression has a variety of symptoms, the most common are feelings of sadness or a marked loss of interest in pleasure or activities (13). Other symptoms include appetite changes resulting in unintended weight loss or gain, insomnia or oversleeping, loss of energy or increased fatigue, restlessness or irritability, feelings of worthlessness or inappropriate guilt and difficulty thinking, concentrating, or making decisions(14). Depression affects 6.7% U.S. adults in any given year and 16.6% will experience depression at some time in their life (14). The prevalence of depression among females is 60% higher

than males (13). Of those adults diagnosed with depression, 63.8% had severe impairment (2). Although depression can occur at any age, it usually first appears in the late teens to mid-twenties (14). Depression is now recognized in children and adolescents and tends to present as irritability, rather than low mood (2). There is no definite cause of depression but there are many contributing factors including genetics, nutrition, environmental stressors, hormonal disruptions, and changes in brain chemistry (12). Approximately one-third of people who have depression do not respond well to the available treatments (12).

For information on screening WIC participants for possible depression please see *Guidance for Screening and Referring with or at Risk for Depression* (available on the Food and Nutrition Service Partner Web). This guidance clarifies WIC staff's role in maternal depression, provides training resources, identifies focus areas of breastfeeding promotion and support, and nutrition education related to maternal depression. It also contains information on referring participants to appropriate mental health services to maximize participant benefit from WIC nutrition services to achieve positive health outcomes.

Prenatal Depression

The most common symptoms of prenatal depression include feelings of sadness, anxiety, and fatigue (15). Women who experience depression during pregnancy are found to be at an increased risk of not following their prenatal medical plan, inadequate or excessive gestational weight gain, smoking, and substance use (16). Studies suggest that pregnant women with untreated symptoms of depression have increased rates of birth complications, preeclampsia, preterm delivery, low birth weight and impaired social, cognitive, and emotional development in the baby (16, 17). Approximately 10% of pregnant women experience depression with some reported rates as high as 22% (18, 19). Women of color and those from lower socioeconomic groups have a significantly higher incidence of prenatal depression (20).

Approximately 6-8% of U.S. women report using or having been prescribed an antidepressant while pregnant (21). There are currently no recommendations on which medication should be used to treat depression during pregnancy and there are concerns about the negative associations of antidepressants on fetal and infant health (12, 22). Selective serotonin reuptake inhibitors (SSRIs) are the most frequently used medication to treat pregnant women with depression (22). Some complications associated with SSRIs and Selective Neurontin reuptake inhibitors (SNRIs) used in pregnancy may include increased risk of spontaneous abortion, preterm birth and low birth weight, poor neonatal adaptation syndrome, persistent pulmonary hypertension and congenital anomalies including heart defects (22). High rates of depression relapse (70%) have been found in some studies when pregnant women have stopped their antidepressant medication (23). The use of antidepressants during pregnancy may also influence a woman's choice for feeding her infant making her less likely to plan on or initiate breastfeeding (24). For all these reasons, it is imperative that prenatal women discuss the benefits and risks of antidepressant therapy as part of the treatment for depression with their health care provider (21).

Depression in Pregnant Adolescents

Adolescent pregnancy is considered a significant risk for depression (25). Women who gave birth before their 20th birthday showed higher levels of depressive and anxiety symptoms (25). The symptoms of depression in adolescence are different than those presented in adulthood (26). While they share a depressed mood, adolescents more frequently show changes in appetite or weight and insomnia, rather than a loss of interests and poor concentration (26). Depression in adolescent pregnancy has a high frequency of suicidal attempts, reaching up to 20% (26).

Teens who are female, have a family history of depression, a history of trauma, family conflict, a chronic medical disease, or who are LGBTQ are at greater risk for developing adolescent depression. Depression in adolescents can occur with other mental illnesses including anxiety. (26)

Postpartum Depression

Postpartum depression (PPD) is a form of depression that occurs within 4 to 6 weeks after childbirth and is one of the most common complications that occurs after pregnancy (27, 28). PPD is associated with many adverse outcomes for both mother and offspring including maternal mortality and morbidity, increased risk for infanticide, poorer maternal-infant attachment, early discontinuation of breastfeeding, and impaired parenting behaviors (12, 27). It affects 10-15% of women (27). The risk factors associated with PPD include genetics, history of a mental illness and adverse life events including physical, psychological, or sexual abuse (27). Discrimination and immigration are often overlooked by adverse life events associated with PPD (27).

PPD is different from the “baby blues” which is used to describe mild mood changes, feelings of worry, unhappiness, and exhaustion in the first 2 weeks after having a baby (15). The “baby blues” is a common reaction following delivery that affects 70-80% of new mothers (12). The “baby blues” typically peak four to five days after delivery and may last hours to days and usually resolve within 2 weeks (12, 15).

Breastfeeding and Depression

Women with PPD are less likely to breastfeed, as PPD is considered a risk factor for breastfeeding self-efficacy (12, 29). Women with low self-efficacy are 3 times more likely to stop breastfeeding early (29). Studies show the presence of depressive symptoms in the postpartum period decrease maternal confidence in breastfeeding and increase the risk of discontinuing exclusive breastfeeding (29). Women with PPD also have fewer positive interactions with their infants and a poorer perception regarding their baby’s behavior (29). Additionally, PPD can negatively affect milk supply due to elevated levels of cortisol in the mother’s system (12). Difficulties with breastfeeding can cause the mother to feel overwhelmed and increase the risk of depression (12). If a mother with early signs of PPD stops breastfeeding, depression can become more severe due to the abrupt drop in oxytocin levels (12). Successful breastfeeding may have a protective effect on maternal mental health because the breastfeeding relationship can decrease feelings of loneliness and emptiness that are common in PPD (12). Higher levels of oxytocin released during breastfeeding can cause the mother to feel calmer and more relaxed (12).

Medications used to treat PPD include SSRIs and SSNIs (23). Most research shows negligible risk in infants exposed to SSRIs in human milk containing antidepressants (24). Sertraline, an SSRI, is the most studied antidepressant in breastfeeding (6). It has minimal transfer into breastmilk and is well tolerated by most infants (6).

Anxiety Disorders

Anxiety disorders are the most common mental illness in adults in the U.S. (12). They include the following types: generalized anxiety disorder, panic disorder, and various phobia-related disorders (30). In anxiety disorders, worry and fear interfere with daily life and are much more severe than occasional anxiety (2,30). All anxiety disorders share an increase in emotional, physical, and neurological symptoms precipitated by a specific situation or circumstance (12). Nineteen percent of the adults in the U.S. have an anxiety disorder; 22% of those individuals experience severe impairment related to their anxiety. (12). The risk factors for anxiety disorders include both genetic and environmental components along with exposure to stressful events, an adverse childhood experience, and a history of mental illness in the family (12, 30).

During pregnancy, anxiety may have adverse effects on both the mother and baby, including impaired fetal development, complications of labor, and altered mental development of the newborn (31). Therefore, it may be necessary to consider medication for anxiety that worsens during pregnancy. Anxiety disorders are usually treated with psychotherapy and medications (30, 32). The medications most used to treat anxiety disorders include anti-anxiety medications (benzodiazepines), antidepressants (SSRIs and SSNIs), and blood-pressure medications (beta-blockers) (2, 30, 32). Benzodiazepines (i.e., Xanax,

Valium) have the benefit of working faster than anti-depressants, but they can be addictive if used over the long-term (30). Both antidepressants, SSRIs (i.e., Zoloft, Prozac) and SSNIs (i.e., Effexor), are used to treat anxiety disorders, but they can take 4-6 weeks for effects on mood to occur (30). An increase in suicidal thoughts or behavior can occur in those under age 25 when taking antidepressant medications, especially in the first few weeks after starting, or when the dose is changed which requires appropriate monitoring by the prescribing provider (33). Beta-blockers can be used to help relieve the physical symptoms of anxiety, including shaking and a rapid heartbeat but they are usually used short-term or on an as needed basis such as during situational anxiety (32). SSRIs are the first-line pharmacological agents for anxiety disorders in perinatal patients (23).

Post-Traumatic Stress Disorder (PTSD)

PTSD is a psychiatric disorder that may occur in people who have experienced or witnessed a traumatic, shocking, scary, or dangerous event (34). People with PTSD have intense or disturbing thoughts and feelings related to their trauma that lasts after the traumatic event has ended (35). They may avoid situations or people that remind them of the event, and they may have strong negative reactions to something like a loud noise or an unexpected touch (35). Symptoms of PTSD usually begin within 3 months of the traumatic incident but sometimes begin years after (35). To be considered PTSD, the symptoms must last more than a month and be severe enough to interfere with relationships or work (35). PTSD can occur at any age and affects 3.5% of the U.S. population with women being more likely to be affected than men (36). Hispanics, Blacks, and Native Americans have higher rates of PTSD than non-Hispanic whites (32). Rape is the most common trigger of PTSD and childhood sexual abuse is a strong predictor for developing PTSD in one's lifetime (36). Approximately 3.3% of pregnant women and 4% of postpartum women have PTSD (37). Women are susceptible to developing PTSD as a result of childbirth (37). Risk factors associated with postpartum PTSD include negative subjective birth experiences, having an operative birth, history of mental health problems, and lack of support (37). Studies support an association between postpartum PTSD with lower birth weights and lower rates of breastfeeding (37). Usually, psychotherapy or medications is used to treat PTSD or a combination of the two (34 ,35). The medications most used to treat the symptoms of PTSD are the antidepressants, SSRIs and SSNIs (34, 35).

Obsessive-Compulsive Disorder (OCD)

OCD is a chronic and long-lasting disorder in which a person has uncontrollable, reoccurring thoughts (*obsessions*) and/or behaviors (*compulsions*) that they feel the urge to repeat over and over (38). The compulsions, such as hand washing, checking on things or cleaning, can interfere with a person's daily life (38). People with OCD have difficulty stopping the obsessive thoughts or the compulsive actions even though they are very distressing and recognize their thoughts and behaviors are excessive (38). OCD occurs in 1.0% of the U.S. population with women and men being equally affected (36). The average age of onset is 19 years old with one-third of affected adults having first experienced symptoms in childhood (36). The causes of OCD are unknown but there are some risk factors associated with it including genetics, childhood trauma, and brain abnormalities (39). People with mild to moderate forms of OCD are usually treated with either cognitive behavioral therapy (CBT) or medication (38). Usually, a high dose of SSRIs is recommended to treat OCD, but it can take up to 12 weeks to notice an improvement (39). In severe forms of OCD, it is recommended that both medication and CBT be used (39). Given the relatively large number of studies regarding their safety in the perinatal period for OCD patients, SSRIs are the first-line medications (30).

Personality Disorders

Personality disorders, including obsessive-compulsive personality disorder (different from OCD), narcissistic personality disorder, antisocial personality disorder, and borderline personality disorder, are an "enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture" (1, 36). Behaviors are pervasive and inflexible, often resulting in distress and

impairment (1). The person's way of thinking, feeling, and behaving is different from the expectations of society and causes problems functioning (40). Personality disorders affect at least two of these areas: the way a person thinks about oneself and others, the way a person responds emotionally, the way a person relates to other people, or the way a person controls their behavior (40). Personality disorders are not usually diagnosed until a person is over the age of 18 because prior to that age a person's personality is still developing (40). It is estimated that 9% of the U.S. population has at least one personality disorder (36). There are no medications specifically used to treat personality disorders, but psychotherapy can be effective (40). Medications, such as antidepressants, anti-anxiety medication or mood stabilizing medication, may be helpful in treating some symptoms under the care of a psychiatrist (40).

Bipolar Disorders

Bipolar disorder (formerly known as manic depressive disorder or manic depression) is a mental illness that causes changes in a person's mood that affects their daily life (41, 42). These mood shifts are known as manic (elevated or agitated) or depressive (sad and hopeless) (41, 42). During depressive episodes, approximately 25-50% of those with bipolar disorder attempt suicide (12). Sometimes people may have mixed episodes, feeling both manic and depressive symptoms at the same time (42). The symptoms of a mood can last from days to weeks and vary in intensity (41). People with bipolar disorders are more likely to have other mental illnesses like anxiety, eating disorders, substance use issues or chronic medical conditions such as diabetes, obesity, or heart disease (12, 41). The lifetime prevalence of bipolar disorder in the U.S. is 4.4% (12). Of those 4.4% diagnosed with bipolar disorder 82.9% have severe impairment (12). The exact cause of bipolar disorders is not known, but genetics, hormones, and an imbalance in brain chemistry are believed to play a role (12, 42). Bipolar disorders also tend to run in families with the average age of onset being 25 years old (42).
Medications are the treatment of choice for bipolar disorders with mood stabilizers like antiseizure medications with lithium being used the most commonly (12). These medications are believed to affect the chemical imbalances in brain (42). Lithium and sodium are similar in chemical bonding, so it is necessary for those taking lithium to have a stable, moderate intake of salt to keep lithium levels steady (12). Simple information based on the Dietary Approaches to Stop Hypertension (DASH) diet could be useful to those taking lithium (12). Mood stabilizers may also cause other side effects that could affect a person's nutritional status including weight gain, increased thirst, nausea, vomiting, and diarrhea (12).

The postpartum period is a vulnerable time for illness relapse in bipolar women (43). Women with bipolar disorder who discontinued their medication during pregnancy had a significantly higher risk of relapsing during the postpartum period (approximately 65% vs 25%) than those who remained taking their medication (6). The effect of lithium use on a breastfed baby is not as well studied (43). Lithium is excreted in human milk (23). Both the American Academy of Pediatrics and the National Library of Medicine (LactMed) provide guidelines for lithium use during breastfeeding, but when lithium therapy is continued during the perinatal period it requires close monitoring of the breastfeeding dyad (23 ,43). Infant monitoring includes checking for over-sedation, restlessness, hydration status, and changes in growth and development (23).

Schizophrenia

Schizophrenia is a serious mental illness that can be severely disabling if not treated (44). It is characterized by delusions, hallucinations, disorganized speech and behavior, and other symptoms that cause social or occupational dysfunction (44). For a diagnosis, symptoms must have been present for six months and have been active for at least one month (1). Schizophrenia affects 1% of the U.S. population (45). It occurs equally in men and women but tends to be diagnosed earlier in males (1, 44). Symptoms appear in males in their late teens or early twenties and in females in their twenties or thirties (12). Genetics is estimated to be responsible for 80% of schizophrenia cases (12). People with schizophrenia also have higher mortality rates due to higher rates of heart disease, liver disease, and diabetes (12, 45). These diseases appear to be more related to fat metabolism than dietary fat intake as schizophrenia appears to be associated with altered metabolism (12). Studies of patients with schizophrenia have shown

them to have three times the amount of visceral fat when compared to those with equal total body fat (12). They also have reduced energy needs which may be related to antipsychotic medications frequently used in the treatment of schizophrenia (12). Antipsychotic medications are associated with increased appetite and weight, with some patients gaining as much as 25-60 pounds over the first few years after starting mediation (12, 44).

People with schizophrenia are at increased risk for substance use disorders. Their lifetime risk of having a serious drug or alcohol problem is 47% compared to 16% for the general population (46). High rates of substance use are associated with poor medical compliance, clinical decline, violence, and suicide. Some researchers think that the genetic risk for schizophrenia also increases the likelihood of substance use and an increased use of substances in adolescence may both increase the risk for developing a later substance use disorder and serve as an additional risk factor for the appearance of psychotic symptoms. (46)

Women with schizophrenia are more likely to have increased rates of stillbirths and neonatal deaths (23). This may be due to illness, other medical conditions, lifestyle factors, or social issues (23). Pregnant women with schizophrenia who take antipsychotics are more likely to be obese, smoke, use alcohol, drugs, other medications, and have pre-existing diabetes and hypertension (23). Antipsychotics may increase the risk of gestational diabetes mellitus (GDM), obesity, and gestational hypertension (23). These conditions can lead to adverse maternal and neonatal outcomes such as fetal growth abnormalities, preterm birth, and congenital malformations (23). Since most antipsychotics are sedating for adults, it is recommended that breastfed infants are monitored for sedation as some cases in infants have been reported (24).

Attention-Deficit/Hyperactivity Disorder (ADHD)

Attention-deficit/hyperactivity disorder (ADHD) is a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development (1). Inattention includes behaviors such as wandering off task, difficulty keeping focus, and disorganization (47). Hyperactivity includes moving constantly, excessively fidgeting, tapping, or talking (47). Impulsivity includes hasty acts that occur without thought and may have a high potential for harm (47, 48). To be diagnosed with ADHD the child must exhibit symptoms before age twelve and consistently show signs of inattention, hyperactivity and impulsivity that is inappropriate for their age and cannot be contributed to other causes (1, 12). These symptoms must be present in more than one setting (1). Many parents first observe excessive motor activity when the child is a toddler, but the symptoms are difficult to distinguish from highly variable normative behaviors before age four (1). ADHD is most often identified during elementary school years when the inattention becomes more prominent and impairing (1). In most individuals with ADHD, symptoms of motoric hyperactivity become less obvious in adolescence and adulthood, but difficulties with restlessness, inattention, poor planning, and impulsivity persist (1). Severe impairment is more likely to be present when an ADHD diagnosis occurs at or before four years of age (1). In the U.S., 9.5-11% of children have been diagnosed with ADHD with nearly 2/3 of those having another behavioral diagnosis (12). Male children are two times as likely to have ADHD compared to female children (1). It is estimated that 2.5% of adults have ADHD (48). Many adults do not even realize that they have ADHD (47). Adults with undiagnosed ADHD may have a history of problems at school, work, or with relationships (48). In adults, hyperactivity may manifest as extreme restlessness or wearing others out with their activity (1, 48). Impulsive behaviors may manifest as social intrusiveness (e.g., interrupting others excessively) and/or as making important decisions without consideration of long-term consequences (e.g., taking a job without adequate information) (1). In the U.S., Black and Hispanic population rates of ADHD tend to be lower than for White populations suggesting that culturally appropriate practices are relevant in assessing ADHD (1).

The causes of ADHD are not understood but genetics play a role (1, 12, 48). Other potential causes or risk factors include premature delivery or low birth weight, alcohol, drugs, or tobacco use during pregnancy, environmental exposure to lead or pesticides at a young age, or brain injury (1, 12, 48). Standard treatment for ADHD includes both behavior therapy and medication (12). Stimulants are usually used as

medications and can cause a reduced appetite and problems with gaining weight (12). Stimulants work by increasing the brain chemicals dopamine and norepinephrine, which play essential roles in thinking and attention (48). With long-term use, this has resulted in lower adult height and potentially negative effects on bone mineralization (12). Nutrition treatment should focus on maximizing interest in eating and eating before medications are taken so they do not affect appetite (12). For children who need to gain weight, calorie dense foods can be offered; bribes or coercion that pressure a child to eat are not effective (12). While the research on diet and its impact on ADHD remains inconclusive, most researchers agree that treatment should include decreasing processed foods, increasing foods high in omega-3 fatty acids, and assuring appropriate weight gain and growth (12).

Medications used to treat ADHD are being more commonly prescribed during pregnancy because if it is not properly treated it can result in risk-taking behavior, potentially placing the mother and fetus in danger (23). There is evidence to support that adequate treatment of ADHD may decrease substance use in the mother (23). However, there is also research that shows the stimulant methylphenidate is associated with an increased risk of low Apgar score at delivery that is not seen in untreated women with ADHD (23). Infants may also have neonatal withdrawal syndrome after being exposed to methylphenidate (23). The data is limited regarding the safety of ADHD medications during the pregnancy and lactation, but it currently does not suggest a link between methylphenidate and congenital malformations (23).

Implications for WIC Nutrition Services

WIC can improve the management of mental illnesses through WIC foods, nutrition education, counseling, and referrals to community resources. The table below provides WIC nutrition services recommendations specific to the disease state:

WIC Nutrition Services Recommendations for Mental Illnesses	
All types of Mental Illnesses	● Make referrals (or encourage continued visits) to the primary health care provider and/or other appropriate mental health and social service programs to initiate and/or maintain treatment. ● Reinforce and support the treatments and therapies prescribed by the participant's health care provider. ● When appropriate, encourage regular, heathy, meals and snacks that are simple and easy to prepare (12). ● Encourage carbohydrate sources from whole grains, vegetables, and fruits to aid in maintaining stable blood sugar levels. Rapid increases in blood glucose can result in an increase in the release of insulin, which in turn raises adrenaline and cortisol which can cause changes in behavior and mood (12). ● Encourage oily fish such as salmon, sardines, and tuna which are high in eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) as the essential Omega-3 fatty acids contribute to overall brain function and may offer some benefit for mental health condition such as depression, anxiety, and bipolar disorder (12). ● Because a person with a mental illness may experience significant distress in social, work, or other settings, WIC professionals should seek to understand how symptom severity impacts eating and physical activity. Value Enhance Nutrition Assessment (VENA) techniques can be used to provide participant centered education and goal setting for these individuals. Goal setting should consider the level of impairment in major life activities and be cognizant of the participant's needs and barriers (5). ● Assess for unintended changes in weight (12). ● Assess current medications and possible drug nutrient interactions.

Depression	● Encourage food choices such as fruits, vegetables, olive oil, whole grains, low-fat dairy, and nutrient dense animal and plant protein sources (e.g., lean meats, poultry and eggs; seafood; nuts and seeds) as part of a healthy dietary pattern (12,49). ● Encourage regular physical activity after consulting healthcare provider (50). ● Educate about prevalence, risks, and signs of postpartum depression. ● Provide breastfeeding education, assessment, and support (e.g., peer counseling) to women with existing depression in the perinatal period.
Anxiety Disorders	● Support gradual behavioral changes (12). ● Encourage practices that promote mindfulness which may be helpful with anxiety (5). ● Recommend maintaining well-balanced meals and routine mealtimes (12).
PTSD and OCD	● Support gradual behavioral changes (12).
Personality Disorders	● Support flexible variety of food choices (provide the participant options to give them the freedom to choose) (12). ● Encourage flexible eating times if possible (12).
Bipolar Disorders	● Encourage regular simple meals and snacks that may help maintain blood sugar levels (12). ● Assess for consistent fluid and salt intake. If taking lithium, education on following the Dietary Guidelines for Americans or the DASH diet may be appropriate (12). ● Encourage social and physical activity (12).

Stigma, prejudice, and discrimination against people with mental illness can cause people to avoid or delay treatment. Individuals with mental illness can have negative attitudes, including internalized shame, about their own condition (i.e., self-stigma). The strong family values of emotional restraint and avoiding shame in some Asian cultures, may be contrary to seeking professional help for mental illness. In addition, some African American communities distrust the mental healthcare system. Stigma not only directly affects individuals with mental illness but also the friends and family of those who seek treatment. The National Alliance on Mental Illness (NAMI) offers some suggestions about what we can do to help reduce the stigma of mental illness (51):

● Talk openly about mental health.

● Educate yourself and others about mental health so you can respond to misperceptions or negative comments by sharing accurate facts.

● Be conscious of language that is used to discuss mental health. For information see: What to Say - Tips for Talking About Mental Illnesses (makeitok.org)

● Encourage equality between physical and mental illness – normalize mental health treatment, just like other health care treatment.

● Show compassion for those with mental illness.

Additional Resources and Information:

- Brochures and Fact Sheets on mental disorders by topic from the National Institute of Mental Health:
  - https://www.nimh.nih.gov/health/publications/index.shtml
- Overview of medications used to treat mental disorders:
  - https://www.nimh.nih.gov/health/topics/mental-health-medications/index.shtml
- Treatment Options for ADHD in Children and Teens: A Review of Research for Parents and Caregivers
  - https://www.ncbi.nlm.nih.gov/books/NBK99163/
- National Suicide Prevention Lifeline:
  - 988 or 1-800-273-8255 or 988
  - https://suicidepreventionlifeline.org/
- National Maternal Health Hotline:
  - 1-833-9-HELP4MOMS
  - National Maternal Mental Health Hotline | MCHB (hrsa.gov)
    - https://mchb.hrsa.gov/programs-impact/national-maternal-mental-health-hotline

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

Nutrition Risk Criterion #902; Woman or Infant/Child of Primary Caregiver with Limited ability to Make Feeding Decisions or Prepare Food, may be an appropriate risk criterion assignment for an infant or child of a WIC mother diagnosed with mental illnesses. Nutrition Risk Criterion #357 Drug-Nutrient Interactions may be assigned, as appropriate, to women taking medications for mental illnesses.

Justification for High Risk

Not Applicable

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362 Developmental Delays

Definition/Cut-Off Value

Developmental, sensory or motor disabilities that restrict the ability to intake, chew or swallow food or require tube feeding to meet nutritional needs

Includes:

- Minimal brain function
- Feeding problems due to a developmental disability such as pervasive development disorder (PDD) which includes autism
- Birth injury
- Head trauma
- Brain damage
- Other disabilities

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Infants and children with developmental disabilities are at increased risk for nutritional problems. Education, referrals, and service coordination with WIC will aid in early intervention of these disabilities. Prenatal, lactating and non-lactating women with developmental, sensory or motor disabilities may have: 1) feeding problems associated with muscle coordination involving chewing or swallowing, thus restricting or limiting the ability to consume food and increasing the potential for malnutrition; or 2) to use enteral feedings to supply complete nutritional needs which may potentially increase the risk for specific nutrient deficiencies.

Pervasive Developmental Disorder (PDD) is a category of developmental disorders with autism being the most severe. Young children may initially have a diagnosis of PDD with a more specific diagnosis of autism usually occurring at 2 1/2 to 3 years of age or older. Children with PDD have very selective eating

habits that go beyond the usual “picky eating” behavior and that may become increasingly selective over time, i.e. foods they used to eat will be refused. This picky behavior can be related to the color, shape, texture, or temperature of a food. Common feeding concerns include:

1) difficulty with transition to textures, especially during infancy;

2) increased sensory sensitivity; restricted intake due to color, texture, and/or temperature of foods;

3) decreased selection of foods over time;

4) difficulty accepting new foods; difficulty with administration of multivitamin/mineral supplementation and difficulty with changes in mealtime environment.

Nutrition education, referrals, and service coordination with WIC will assist the participant, parent or caregiver in making dietary changes/adaptations and finding assistance to assure she or her infant or child is consuming an adequate diet.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Explain that nutrition and energy needs must be individualized for each person
- Discuss providing adequate energy and nutrient intake to maintain or provide for adequate growth and development including appropriate/adequate fluid levels
- Factors to consider include:
    - developmental level or oral-motor skills level (i.e. chewing, swallowing and self-feeding)
    - feeding position is of prime importance
        - head and body should be supported to minimize abnormal oral movement patterns and increase participant’s voluntary oral control
    - muscle tone, cough and gag reflexes, especially if hypersensitive gag reflexes are a problem
    - tube feeding, oral feeding or the process of transitioning from tube to oral feeding
    - availability and use of specially adapted utensils for feeding
    - bowel management, especially constipation management (fiber and fluid recommendations)
- Discuss:
    - recommended frequency of meals and snacks
    - appropriate mealtime behavior management
    - recognizing and responding to hunger cues
- Discuss ways to select nutritionally adequate food based on participant’s oral-motor feeding development levels and total energy needs, including:
    - appropriate choices for texture level, i.e. liquid, pureed, thickened liquids
    - ways to increase or decrease caloric intakes

    - if appropriate, discuss use of special formulas, especially higher calorie formulas, which may be indicated for some of these conditions
- Participant may have special/altered nutrient needs due to drug/nutrient interactions
- Provide family with lots of positive reinforcement and support
- For participants diagnosed with **Autism**:
    - Recognize that child may have a sensory-based feeding problem that results in extreme pickiness, difficulty with changes, sensitivity to tastes, texture, smells and new foods or anything different
        - Picky eating is not a result of inadequate parenting with food
        - Be sensitive to difficulties family experiences with feeding
    - Children with autism who are especially sensitive to tastes, textures, smells or new foods need many exposures to a new food before they will eat it
        - Touching, playing with and otherwise interacting with food can desensitize child
        - Child may move through many stages before food is accepted, including touching, smelling or licking the food
    - Keep mealtimes consistent
    - Use same plates and utensils
    - Eat at same place and at same time
    - Teach social structure of eating
        - Child needs to stay at table with the family
    - Offer small servings of a few (2-3) foods at one time
    - Avoid offering too much food or too many choices
        - Make changes gradually
    - Offer a food the child likes at each meal
    - Offer new foods along with foods child will already eat
    - Introduce foods in forms similar to foods child already eats
    - Continue to offer variety of foods, or child will become more restrictive over time
    - Use non-food reinforcement (verbal praise is best)
        - Reinforce child for ANY positive food behavior
        - Reinforce siblings for appropriate eating behaviors as well
    - Many parents are experimenting with special diets (casein-free, gluten-free) or supplements
        - There is at present no established scientific basis for restrictive diets for children with autism
        - However, if parent chooses to try dietary restriction, refer to dietitian
            - Dietitian should support family and provide guidance on adequate diet and appropriate substitutes for foods restricted (e.g. substitute soy formula for milk, authorize calcium-fortified juice, recommend gluten-free cereal)

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363 Pre-Diabetes

Definition/Cut-Off Value

Impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT) are referred to as pre-diabetes. These conditions are characterized by hyperglycemia that does not meet the diagnostic criteria for diabetes mellitus (1). (See Clarification for more information.) Presence of pre-diabetes diagnosed by a physician as self-reported by applicant/participant/caregiver; or as reported or documented by a physician, or someone working under physician's orders.

Participant Category and Priority Level

Category	Priority	High Risk
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

An individual who is identified as having pre-diabetes is at relatively high risk for the development of type 2 diabetes and cardiovascular disease (CVD). The Expert Committee on the Diagnosis and Clarification of Diabetes Mellitus (2, 3) recognized a group of individuals whose glucose levels, although not meeting criteria for diabetes, are nevertheless too high to be considered normal. The blood tests used to measure plasma glucose and to diagnose pre-diabetes include a fasting plasma glucose test and a glucose tolerance test (see Clarification for more information). Individuals with a fasting plasma glucose level between 100-125 mg/dl are referred to as having impaired fasting glucose (IFG). Individuals with plasma glucose levels of 140-199 mg/dl after a 2-hour oral glucose tolerance test are referred to as having impaired glucose tolerance (IGT). Many individuals with IGT are euglycemic and, along with those with IFG, may have normal or near normal glycosylated hemoglobin (HbA1c) levels. Often times, individuals with IGT manifest hyperglycemia only when challenged with the oral glucose load used in standardized oral glucose tolerance test. The prevalence of IFG and IGT increases greatly between the ages of 20-49 years. In people who are >45 years of age and overweight (BMI >25), the prevalence of IFG is 9.3%, and for IGT, it is 12.8% (4). Screening for pre-diabetes is critically important in the prevention of type 2 diabetes. The American Diabetes Association recommends (5) that testing to detect pre-diabetes should be considered in all asymptomatic adults who are overweight (BMI >25) or obese (BMI >30) and who have one or more additional risk factors (see Table 1 in Clarification).

IFG and IGT are not clinical entities in their own right but, rather, risk factors for future diabetes as well as CVD. (Note: During pregnancy, IFG and IGT are diagnosed as gestational diabetes.) They can be observed as intermediate stages in many of the disease processes. IFG and IGT are associated with the

metabolic syndrome, which includes obesity (especially abdominal or visceral obesity), dyslipidemia (the high-triglyceride and/or low HDL type), and hypertension. Dietary recommendations include monitoring of calories, reduced carbohydrate intake and high fiber consumption. Medical nutrition therapy (MNT) aimed at producing 5-10% loss of body weight and increased exercise have been variably demonstrated to prevent or delay the development of diabetes in people with IGT. However, the potential impact of such interventions to reduce cardiovascular risk has not been examined to date (2, 3). WIC nutrition services can support and reinforce the MNT and physical activity recommendations that participants receive from their health care providers. In addition, WIC nutritionists can play an important role in providing women with counseling to help them achieve or maintain a healthy weight after delivery. The WIC food package provides high fiber, low fat foods emphasizing consumption of whole grains, fruits, vegetables and dairy products. This will further assist WIC families in reducing their risk for diabetes.

Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis. Hyperglycemia is identified through a fasting blood glucose or an oral glucose tolerance test (1). Impaired fasting glucose (IFG) is defined as fasting plasma glucose (FPG) >100 or >125 mg/dl (>5.6 or >6.1 mmol/l), depending on study and guidelines (2). Impaired glucose tolerance (IGT) is defined as a 75-g oral glucose tolerance test (OGTT) with 2-h plasma glucose values of 140-199 mg/dl (7.8-11.0 mmol/l). The cumulative incidence of diabetes over 5-6 years was low (4-5%) in those individuals with normal fasting and normal 2-h OGTT values, intermediate (20-34%) in those with IFG and normal 2-h OGTT or IGT and a normal FPG, and highest (38-65%) in those with combined IFG and IGT (4). Recommendations for testing for pre-diabetes and diabetes in asymptomatic, undiagnosed adults are listed in Table 1 below.

Justification for High Risk
Not Applicable

Reference

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371 Maternal Smoking

Definition/Cut-Off Value

Any daily smoking of tobacco products, i.e., cigarettes, pipes, or cigars

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Auto Assignment

Auto assigned if “cigarettes per day now” is > 0 in the Nutrition Interview

Justification

Research has shown that smoking during pregnancy causes health problems and other adverse consequences for the mother, the unborn fetus and the newborn infant such as: pregnancy complications, premature birth, low-birth-weight, stillbirth, infant death, and risk for Sudden Infant Death Syndrome (SIDS) (1). Women who smoke are at risk for chronic and degenerative diseases such as: cancer, cardiovascular disease and chronic obstructive pulmonary disease. They are also at risk for other physiological effects such as loss of bone density (2).

Maternal smoking exposes the infant to nicotine and other compounds, including cyanide and carbon monoxide, in-utero and via breast milk (3). In-utero exposure to maternal smoking is associated with reduced lung function among infants (4). In addition, maternal smoking exposes infants and children to environmental tobacco smoke (ETS). (See #904, Environmental Tobacco Smoke).

Because smoking increases oxidative stress and metabolic turnover of vitamin C, the requirement for this vitamin is higher for women who smoke (5). The WIC food package provides a good source of vitamin C. Women who participate in WIC may also benefit from counseling and referral to smoking cessation programs.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Explain potential risks associated with smoking during pregnancy:
    - Spontaneous abortions

  - Stillbirth
  - Bleeding during pregnancy
  - Placental complications (abruptio placenta, placenta previa)
  - Complications of labor (preterm labor, prolonged and premature rupture of the membranes)
  - Fetal growth restriction
  - Small for gestational age
  - Perinatal mortality
- Other adverse effects which are significantly greater as maternal age increases:
  - Prematurity
  - Neonatal mortality (respiratory distress syndrome and SIDS)
- Inform breastfeeding woman that smoking has been reported to:
  - Decrease production and volume of breast milk
- Counsel on ways to achieve adequate diet for age and condition with emphasis on increased intakes of vitamins A & C, fiber, folate and iron

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372A Alcohol Use

Definition/Cut-Off Value

For Pregnant Women:

- Any alcohol use

For Breastfeeding and Not Breastfeeding woman:

- High Risk Drinking: Routine consumption of ≥8 drinks per week or ≥4 drinks on any day.
- Binge Drinking: Routine consumption of ≥4 drinks within 2 hours.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Auto Assignment

Auto assigned for pregnant women if “alcohol per week now” is > 0 in the Nutrition Interview

Auto assigned for breastfeeding and Not Breastfeeding woman if current alcohol intake is marked as > 5 drinks/wk in the Nutrition Interview

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

Substance use and misuse during pregnancy and postpartum may have physical and mental health consequences ranging from mild to serious (2). The use of alcohol, marijuana, illegal drugs and misuse of prescription drugs can threaten both maternal and fetal health. Misuses of prescription drugs include using medications as follows: for nonmedical reasons, prescribed for someone else, more often than the prescribed frequency, in larger-than-prescribed doses, and/or over a longer time than prescribed (3).

Substance use is known to lead to vitamin and mineral deficiencies that threaten physical and mental health, damage vital organs and the nervous system, and decrease immunity. Malnutrition occurs when the substance replaces other dietary nutrients or as a result from improper nutrient metabolism,

absorption, utilization, or excretion even though the diet may be adequate. Harmful lifestyles are often associated with addiction, such as poor eating patterns, lack of exercise, and changes in sleep patterns. These compounding factors result in an increased risk of long-term health problems, including metabolic syndrome, diabetes, hypertension, weight problems, and eating disorders. People with substance addiction may suffer from calorie and protein malnutrition. In one study over 90% were underweight and 70% had vitamin D deficiency and low levels of vitamin C. Another study showed that 50% were deficient either in iron or vitamins (vitamins A, C, and E being the most common). (4)

Substance use can impact the family and parenting in a number of ways, and may be linked with poor parenting practices, child neglect, and abuse due to (2):

- Impairments (both physical and mental) caused by alcohol or other drugs.
- Domestic violence, which may be a result of substance use.
- Expenditure of often limited resources on purchasing alcohol or other drugs.
- Frequent arrests, incarceration, and court dates.
- Time spent seeking out manufacturing or using alcohol or other drugs.
- Estrangement from primary family and related support.

While substance use has long been a public health concern, there is growing recognition that the United States is facing an epidemic due to an increase in opioid misuse, use disorders, and overdose, and that disparities exist between men and women with regard to both prescription opioid and heroin use (5). Although between 1999 and 2014 men were more likely than women to die of opioid overdoses, the gap in mortality has been closing (6). Between 1999 and 2010, overdose deaths from prescription pain killers increased more than 400% among women, compared to an increase of 237% among men (7). Although nonmedical use of prescription opioids among women has generally been decreasing since then, heroin use among women has been increasing, and at a faster rate among women than among men (8, 9, 10). For example, between 2002 and 2013, heroin use among women increased 100% compared to an increase of 50% among men (5).

Predictors of substance use among women of childbearing age include (2, 11, 12):

- Early Substance Use – Tobacco or marijuana use at an early age (12- 18 years of age) is a risk factor for continued use as an adult.
- Pre-pregnancy Substance Use – Alcohol and drug use prior to pregnancy is a predictor of continued use during pregnancy.
- Demographic Characteristics – Use and substance choice vary by demographic group:
    - Substance use after pregnancy is more likely for Native Americans and African Americans.
    - African American women and economically disadvantaged women are more likely to use illicit substances, particularly cocaine.
    - White women and women with higher education levels are more likely to use alcohol.

Trauma – Substance use is increased among women who:

- Were raised by parents who abused substances.
- Have experienced physical and/or sexual abuse.
- Have experienced intimate partner violence.

- Mental Health – Women with a diagnosis of substance use or chemical dependency may have one or more psychiatric disorders.

Alcohol and Substance Use during Pregnancy

Maternal substance use during and after pregnancy can have a long-term impact on both the mother and her child and can impact many areas of life such as: (2, 13, 14)

- Obstetrical and Prenatal Complications - Substance use (and withdrawal from them) during pregnancy may cause constriction of uterine blood vessels leading to insufficient blood flow to the placenta, separation of the placenta from the uterus, maternal hypertension, maternal hemorrhage, and/or premature labor. These complications may in turn increase risk of fetal loss, premature birth and still birth.
- Personal Health and Safety – Substance use is associated with increased likelihood of death by illness, accident or suicide; intimate partner violence; sexually transmitted diseases and unintended pregnancy. Although 31% to 47% of U.S. pregnancies are unintended, the proportion of unintended pregnancies for women with opioid use disorder was higher than 85%, according to recent research.
- Societal Impacts - Substance use is associated with an unstable family structure, separation and divorce, and potential for involvement of Child Protective Services (CPS). The Child Abuse Prevention and Treatment Act [42 U.S.C. § 5106a(b)] requires States to have policies and procedures in place to notify CPS agencies of substance-exposed newborns and to establish a plan of safe care for newborns identified as being affected by illegal substance abuse or having withdrawal symptoms resulting from prenatal drug exposure. For more information about State- specific requirements please see: https://www.childwelfare.gov/topics/systemwide/laws- policies/state/.
- Impact on Children - Children who are exposed to alcohol and other substances prior to birth can experience long-term cognitive, behavioral, social and emotional developmental consequences.

Based on data collected by the Substance Abuse and Mental Health Services Administration (SAMHSA), in 2012-2013 alcohol use among pregnant women aged 15-44 was 9.4%; 2.3% reported binge drinking and 0.4% reported heavy drinking. These rates were lower than the rates for non-pregnant women in the same age group (55.4%, 24.6% and 5.3% respectively). Alcohol use in 2012-2013 was lower among pregnant women aged 15 to 44 during the second and third trimesters than during the first trimester (5.0% and 4.4% vs. 19.0%). (3)

Nutritional needs during pregnancy are 10 to 30 percent greater than normal (15). Alcohol can disrupt body functions by causing nutrient deficiencies of vitamins and minerals (4). Alcohol inhibits fat absorption and thereby impairs absorption of vitamins A, E, and D which are normally absorbed along with dietary fats. Deficiencies of minerals such as calcium, magnesium, iron, and zinc are common in people who misuse alcohol, although alcohol itself does not seem to affect the absorption of these minerals (4).

There is no safe consumption of alcohol during pregnancy. Exposure to alcohol in utero can damage the developing fetus at any stage and is the leading preventable cause of birth defects and intellectual and neurodevelopmental disabilities (16, 17). Not only can nutritional deficiencies of a mother who misuses alcohol adversely affect the nutrition of the fetus, but alcohol itself can also restrict nutrient flow to the fetus. These prenatal factors can result in the infant being born with a Fetal Alcohol Spectrum Disorder (FASD). Fetal Alcohol Syndrome (FAS) is the most severe type of FASD. Fetal Alcohol Syndrome can affect children in different ways. A child with FAS might have abnormal facial features, growth and central nervous system problems as well as problems with learning, memory, attention span, communication, vision, or hearing (18). (See risk 382 - *Fetal Alcohol Syndrome* for more information.)

In 2012 and 2013 illicit drug use (to include marijuana use) among pregnant women aged 15 to 44 was 5.4%. This was lower than the rate among women in this age group who were not pregnant (11.4%). Illicit drug use in 2012-2013 was lower among pregnant women aged 15 to 44 during the third trimester than during the first and second trimesters (2.4%t vs. 9.0% and 4.8%). (3)

Marijuana is the illicit drug used most frequently by women of child-bearing age (19). There is no known safe amount of marijuana use during pregnancy. Marijuana contains tetrahydrocannabinol (THC), which is the chemical in marijuana that makes one feel “high”. Marijuana may be ingested in the form of marijuana edibles (cookies, brownies, candy, etc.) or inhaled when smoked. When inhaled, the smoke goes into the lungs and immediately passes through the membranes and enters the bloodstream (2). THC can pass from the mother to the unborn child through the placenta if marijuana is ingested or inhaled during pregnancy. Children who are exposed to THC prior to birth can experience decreased academic ability, cognitive function and ability to remain attentive (20). Although some states have legalized marijuana for a variety of medical conditions upon a doctor’s recommendation, as well as for recreational use, marijuana has been shown to have negative effects on brain development. Therefore, it is recommended that pregnant and breastfeeding women not use marijuana (2).

National Surveys on Drug Use and Health done by SAMHSA indicate that an annual average of about 21,000 pregnant women aged 15 to 44 misused opioids in the past month (21). The percentage of women misusing opioids in the past month was lower among pregnant women aged 15 to 44 than among non- pregnant women in that age range (0.9% vs. 2.6%) (21). Opiates and synthetic narcotics (e.g., heroin, oxycodone, Vicodin, Narco, Percocet, morphine, Dilaudid) have serious health risks associated with their use including endocarditis; coma or sudden death from overdose; risk of HIV; and, if injected, viral hepatitis and other infections (2). A mother’s use of these substances during pregnancy can lead to neonatal abstinence syndrome (NAS), which is a series of withdrawal symptoms experienced by an infant after birth due to intrauterine exposure to substances. Prenatal exposure to opioids increases the risk of low birth weight, stillbirth and sudden infant death syndrome (see risk 383 - *Neonatal Abstinence Syndrome* for more information).

For a summary of the effects of alcohol, marijuana, opioids and more information about the effects of other specific drugs during pregnancy, see table on page 5.

Alcohol and Substance Use during Breastfeeding

The breastfeeding mother should minimize alcohol use and avoid the use of other substances since most maternally ingested substances are transferred to human milk, though the concentration and

potential danger to the breastfed baby is affected by interaction among a variety of factors. The American Academy of Pediatrics (AAP) recommends that the ingestion of beverages containing alcohol be minimized and limited to occasional intake for breastfeeding women. The following are recommendations for breastfeeding women who choose to drink (2, 22, 23, 24):

- Consult with health care provider before consuming alcohol.
- Do so only if breastfeeding is well established, consistent and predictable (no earlier than 3 months postpartum).
- Minimize ingestion of alcoholic beverages and limit it to occasional intake.
- Consume only a single alcoholic drink and wait at least 4 hours before breastfeeding or expressing milk to ensure the alcohol is not present in the milk.
- Breastfeed the infant or express human milk before consuming the alcohol.

Due to the lipophilic nature of THC found in marijuana, it is tremendously fat-soluble and therefore is readily transferred to human milk. Marijuana can impact the neurobehavioral development of the infant, and the AAP considers it to be a contraindication to breastfeeding. (2, 22, 23)

The maternal use of illegal substances and the misuse of prescription medicine is a contraindication to breastfeeding. However, according to the AAP, appropriate maternal use of prescribed medication is not a categorical contraindication to breastfeeding. For situations in which the mother is undergoing pharmacologic therapy, breastfeeding must balance the benefits to infants and mother against the potential risk of substance exposure to the infant. For example, research has shown that adequately nourished narcotic-dependent mothers should be encouraged to breastfeed if they are enrolled in a supervised medication-assisted treatment program and have negative toxicology screens for HIV and illicit drugs. (22) (See risk 383 - *Neonatal Abstinence Syndrome* for more information.)
The following table is a summary of effects of specific drugs on the mother, birth outcomes and breastfeeding (2). For more information, please see the *Substance Use and Prevention Manual: Screening, Education and Referral Resource Guide for Local WIC Agencies*: https://wicworks.fns.usda.gov/resources/wic-substance-use-prevention-guide.

Substance	Effects on Mother	Effects on Birth Outcomes	Effects on Baby*
Alcohol	• Impaired judgment, reflexes, memory, and coordination • Heart and liver damage • Pancreatitis • Peptic ulcers • Malnutrition • Alteration of menstrual cycle	• Miscarriage • Stillbirth • Low birth weight • Preterm delivery • Increased incidence of fetal distress at delivery • Sudden Infant Death Syndrome • Fetal Alcohol Spectrum	• Reduced growth • Reduced milk consumption • Delayed motor development • Altered postnatal growth, sleep patterns, and/or psychomotor patterns
Marijuana	• Increased blood pressure • Increased heart rate • Rapid pulse • Anxiety sensory distortions	• Visual abnormalities • Ocular hypertelorism (widely spaced eyes) • Severe epicanthus (skin folds at the corner of the upper eyelids)	• Poor sucking • Sedation • Reduced muscle tone • Delayed growth • Delayed motor development
Amphetamines (e.g., methamphetamine and dextroamphetamine)	• Irritability and confusion • Decreased appetite • Convulsions • Stroke • Heart failure	• Premature delivery • Low birth weight • Small for gestational age	• Poor sleep patterns • Irritability • Extreme agitation • Hallucinations • Seizures
Cocaine and Crack	• Increased heart rate • Increased blood	• Preterm delivery • Reduced head	• Vomiting • Diarrhea

Substance	Effects on Mother	Effects on Birth Outcomes	Effects on Baby*
Cocaine and Crack (continued)	pressure • Sudden death from cardiac arrhythmia or respiratory arrest • Irritability • Separation of the placenta from the uterus prior to delivery	circumference • Increased risk of spontaneous abortion • Increased risk of seizures • Neurological abnormalities	• High blood pressure • Seizures • Choking • Irritability • Neurobehavioral problems
Opiates & Synthetic Narcotics (e.g., heroin, morphine, codeine, oxycodone, and hydrocodone)	• Endocarditis • Decreased appetite • Respiratory depression • Coma or sudden death from overdose	• Low birth weight • Still birth • Neonatal Abstinence Syndrome • Sudden Infant Death Syndrome	• Irritability • Extreme agitation • Seizures • Poor sleep patterns • Hallucinations
Sedative – Hypnotics (e.g., benzodiazepines, barbiturates, and sleep medications)	• Apprehensiveness • Convulsions • Dilated pupils • Respiratory depression • Confusion • Slurred speech	• Increased risk of fetal malformations	• Restlessness • Tremor • Apnea • Diarrhea • Vomiting • Poor feeding

*The effect of substances on the baby should be carefully considered when providing support to breastfeeding dyads as these effects may be barriers to successful breastfeeding.

Implications for WIC Nutrition Services

Through established linkages and coordination with local resources, WIC staff are required to refer participants suspected of substance use, and those who disclose substance use, to existing assessment agencies for professional evaluation and treatment, as appropriate. In addition to providing referrals and coordinating/facilitating services, WIC's role in preventing substance abuse is to educate women participants, parents, and caretakers of participating infants and children about substance use–related problems with the intended effects of increasing participants' access to information about the dangers of substance use and abuse during pregnancy and breastfeeding as well as postpartum. WIC also provides

supplemental foods that are rich in the nutrients lost from alcohol and substance misuse. WIC staff can assist participants by:

- Providing referrals (and follow-up on the referral) for professional assessment and treatment. Do not advise a woman who uses narcotics to stop use on her own. This step should be taken only under the supervision of a physician or treatment specialist.
- Encouraging women to improve their lifestyle and health habits during pregnancy and postpartum, since the concern for fetal health and/or the desire to be a good role model can be a powerful motivator to reduce or stop substance use (25).
- Emphasizing the importance of substance abuse treatment during the postpartum period to safeguard the health of the mother and reduce the risk in subsequent pregnancies.
- Recommending the Dietary Guidelines for Americans to address nutrition deficiencies associated with substance use.
- Providing breastfeeding promotion and support to women enrolled in supervised medication- assisted treatment programs.
- Recommending that the ingestion of beverages containing alcohol be minimized and limited to occasional intake for breastfeeding women. Provide instruction to wait at least 4 hours after consuming one alcoholic drink before breastfeeding or expressing milk. (If the appropriate amount of time has elapsed the woman may breastfeed or express her milk – it is not necessary to pump and discard the milk.)
- Referring to community resources for alcohol and substance use support groups.

Justification for High Risk

The exact amount of alcoholic beverages pregnant women may drink without risk to the developing fetus is not known as well as the risk from periodic bouts of moderate or heavy drinking. Alcohol has potential to damage the fetus at every stage of pregnancy leading to miscarriage or preterm birth,
LBW, and fetal alcohol syndrome (FAS). Birth defects of FAS children are usually first characterized by facial abnormalities than mental retardation specifically in memory, attention and cognition, a decreased IQ, and social problems (1, 3). After giving birth to a child with FAS, mothers are at a high risk of abusing alcohol, which can interfere with mother-child bonding and infant rearing. During the postnatal year, alcohol users and binge drinkers are more likely to experience depression (1).

There is no cure for FAS, prevention is the only answer. Therefore, the recommendation is not to drink any alcoholic beverage during pregnancy. WIC can provide supplemental foods, nutrition education and referral to medical and social services which can monitor and provide assistance to the family. An intensive interview method of asking about alcohol use before

recognition of pregnancy has more positive affects than by the single clinic screening question asking their date of last drink (3).

Additional Counseling Guidelines

- Explain risks associated with drinking alcohol during pregnancy and breastfeeding:
  - It is rapidly transmitted through placenta and through breast milk
  - There is no known safe amount during pregnancy
  - It can damage the fetus at any stage of pregnancy
- Excessive alcohol during pregnancy can cause:
  - Low birth weight
  - Reduced growth rate
  - Birth defects
  - Mental retardation
  - Adverse physical and behavioral effects
  - Spontaneous abortions
  - Subtle behavioral effects
  - Poor postnatal growth in children without full Fetal Alcohol Syndrome (FAS)
  - FAS
- Excessive alcohol during breastfeeding period may be associated with:
  - Failure to initiate let-down reflex
  - Lethargy in breastfed infants
  - Low intake of folate, thiamin, etc.
- Excessive alcohol consumption may impair a postpartum woman's ability to care for her infant
- Counsel on ways to provide an adequate diet for age and condition:
- If appropriate, emphasize nutrients that chronic alcoholics frequently have a lower nutrient intake of:
  - Protein from meat
  - Vegetable sources
  - Dairy foods and calcium sources
  - Cereals and breads
  - B vitamins and vitamin D
- If appropriate, discuss nutrient deficiencies that occur in heavy drinkers and food sources of these nutrients to combat deficiencies:
  - Zinc
  - Vitamin A
  - Folate
  - Thiamin

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372B Substance Use

Definition/Cut-Off Value

For Pregnant Women:

- Any illegal substance use and/or abuse of prescription medications.
- Any marijuana use in any form.

For Breastfeeding and Not Breastfeeding Postpartum Women:

- Any illegal substance use and/or abuse of prescription medications.
- Any marijuana use in any form (breastfeeding women only).

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	Y
Breastfeeding	I	N
Not Breastfeeding	VI	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel.

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

See Justification for 372A.

Justification for High Risk

The exact amount of illegal drugs a pregnant woman can take in without risk to the developing fetus is not known. Drugs have the potential to damage the fetus at every stage of pregnancy by inhibiting growth and neurodevelopment while increasing the risk for low birth weight and head circumference as well as premature birth. The effects of prenatal substance abuse are irreversible. Therefore, the recommendation is to not take any illegal drugs during pregnancy.

Mothers who abuse substances are likely to experience additional comorbidities which include mental illness, emotional or sexual abuse, and gynecological complaints. WIC can provide supplemental foods, nutrition education and referral to medical and social services which can monitor and provide assistance to the family.

Additional Counseling Guidelines

- Explain risks associated with use of illegal drugs during pregnancy and breastfeeding:
    - Rapidly transmitted through placenta and through breast milk
    - No known safe amount during pregnancy
    - Can damage the fetus at any stage of pregnancy
- If appropriate, explain specific risks of illegal drug use during pregnancy:
    - Marijuana can cause higher rates of:
        - Low birth weight
        - Miscarriage
        - Stillbirth
        - Fetal abnormalities
    - Cocaine can cause higher rates of:
        - Miscarriage
        - Premature onset of labor
        - Intrauterine Growth Retardation (IUGR)
        - Developmental/behavioral abnormalities in children in the preschool years
        - Infants may exhibit signs of cocaine toxicity
    - Heroin, methadone and other narcotics may more likely cause:
        - Stillborn
        - Low birth weight
        - Need to go through withdrawal soon after birth
    - Amphetamines may cause higher rates of:
        - Congenital defects
        - Growth retardation
        - Preterm delivery
- For breastfeeding women:
    - Marijuana, cocaine, and heroin appear in breast milk
    - Marijuana may cause lethargy and decreased feedings in the infant
    - Cocaine and heroin put infant at considerable risk of toxicity
- For postpartum women, illegal drug use may impair ability to care for infant
- Counsel on ways to provide adequate diet for age and condition emphasizing any nutrients participant may be low in
    - Cocaine, phencyclidine (PCP), and marijuana users may have low serum levels of iron or folate
    - Cocaine is an appetite suppressant and may cause participant to reduce intake of energy and nutrients

References

See References for 372A.

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381 Oral Health Conditions

Definition/Cut-Off Value

Oral health conditions include, but are not limited to:

- Dental caries, often referred to as “cavities” or “tooth decay”, is a common chronic, infectious, transmissible disease resulting from tooth-adherent specific bacteria that metabolize sugars to produce acid which, over time, demineralizes tooth structure (1).
- Periodontal diseases are infections that affect the tissues and bone that support the teeth.

  Periodontal diseases are classified according to the severity of the disease. The two major stages are gingivitis and periodontitis. Gingivitis is a milder and reversible form of periodontal disease that only affects the gums. Gingivitis may lead to more serious, destructive forms of periodontal disease called periodontitis.(2)
  More information on types of periodontal disease is available at:
  http://www.perio.org/consumer/2a.html.
- Tooth loss, ineffectively replaced teeth or oral infections which impair the ability to ingest food in adequate quantity or quality

Presence of oral health conditions diagnosed, documented, or reported by a physician, dentist, or someone working under a physician’s orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification

Oral health reflects and influences general health and well-being. Good oral health care and nutrition during pregnancy, infancy and childhood are often overlooked factors in the growth and development of the teeth and oral cavity.

Infants and Children

The Centers for Disease Control and Prevention (CDC) reports that dental caries may be the most prevalent infectious disease in U.S. children. More than 40% of children have tooth decay by the time they reach kindergarten. Infants that consume sugary foods, are of low socioeconomic status, and whose mothers have a low education level, are 32 times more likely to have caries at the age of 3 years than children who do not have those risk factors. Despite its high prevalence, early childhood caries (ECC) is a preventable disease. (3)

ECC may develop as soon as teeth erupt. Bacteria, predominantly mutans streptococci (MS), metabolize simple sugars to produce acid that demineralizes teeth, resulting in cavities. The exact age at which MS colonization occurs in children is controversial, but it does not happen until teeth erupt. The earlier colonization occurs, the greater the risk of caries. MS typically originates in the mother and is transmitted to the child via saliva (often through cup and utensil sharing). Elevated maternal levels of MS, due to active or untreated caries and frequent sugar consumption, increase the risk of transmission. In addition, recent evidence suggests that exposure to environmental tobacco smoke increases the likelihood of MS colonization in children. (4)

Historically, ECC has been attributed to inappropriate and prolonged bottle use; formally called "baby bottle tooth decay." However, recent studies indicate that the disease is multifactorial, which suggests any feeding practice that allows frequent sugar consumption in the presence of MS may result in caries formation: propped bottles containing sweetened liquids or formula, frequent consumption of juice or sweetened liquids from infant and "sippy" cups, and frequent snacking of high cariogenic foods. (4)

The frequency of sugar consumption is the main dietary variable in caries etiology. After bacteria metabolize sugar into acid, it takes 20-40 minutes for the acid to be neutralized or washed away by saliva. Therefore, if sugars are frequently consumed, the potential for demineralization is greater. Although MS can metabolize many different carbohydrates, they produce acid most efficiently from sugars, especially sucrose. Sugars within the cellular structure of food (such as fructose in whole fruit) are thought to be less cariogenic than sugars intentionally added to foods. (4) See **Table 1** for more information on the cariogenic potential of children's foods and snacks.

Milk is widely consumed, especially by children, and thus the interaction between different kinds of milk consumed and caries development has been a research topic of interest. Lactose is one of the least cariogenic sugars because it is poorly metabolized by MS. Researchers have reported cows' milk to be a protective, anticariogenic agent due to its high concentration of calcium and phosphate. The buffering activity of proteins present in cows' milk also might

allow the formation of very stable complexes of calcium phosphate. Other anticariogenic properties in cows' milk include antibacterial enzymes, vitamin D and fluoride. (4,5)

Infant formulas, on the other hand, have a high potential for inducing caries due to their high carbohydrate variability. The cariogenic potential of human milk is inconclusive. Human milk has been found to contain more lactose (8.3%) than cows' milk (4.9%). A higher human milk lactose concentration and the possibility that lactose fermentation of cows' milk is slower than in human milk, may make human milk carries risk slightly higher. Some evidence indicates that breastfeeding for over 1 year during the night after tooth eruption might be associated with ECC, however other investigations showed no relationship between prevalence of caries and breastfeeding. Regardless of the type of milk consumed, sufficient dental care and cleaning after drinking milk/formula and breastfeeding can help prevent ECC. Avoiding inappropriate dietary practices, such as frequent juice consumption or snacking on highly cariogenic foods also remain important ECC preventive practices. (4,5)

Table 1. Cariogenic Potential of Children's Foods and Snacks

Noncariogenic	Low Cariogenicity	High Cariogenicity
Cheese Chicken Cottage Cheese Eggs Flavored Club Soda Nuts and seeds* Plain Cow's Milk (unflavored) Plain Yogurt Popcorn* Seltzer Vegetables	Flavored Milk Fresh fruits Whole grain products	Breakfast-bars Cake Candies** Cookies Doughnuts Granola bars Pretzels Raisins and other dried fruits Soda crackers Sweetened beverages (including fruit juice) Sweetened dry cereals

*Not appropriate for infants and toddlers due to potential choking problems.

**Sticky candy and/or slowly eaten candy are extremely cariogenic.

Adapted from: Faine, MP. Nutrition and oral health. In: Proceedings of Promoting Oral Health of Children with Neurodevelopmental Disabilities and Other Special Health Care Needs. May 4-5, 2001. Seattle, WA.

Women

Maternal periodontal disease and dental caries may impact pregnancy outcome, and the offspring's risk of developing early and severe dental caries. Periodontal disease and caries may also increase the women's risk of atherosclerosis, rheumatoid arthritis and diabetes. These oral health problems are highly prevalent in women of childbearing age, particularly among low-income women and members of racial and ethnic minority groups. Socioeconomic factors, lack of resources to pay for care, barriers to access care, lack of public understanding of the importance of oral health and effective self-care practices all represent underlying reasons cited for observed inadequacies in oral health. (6) Maternal periodontal disease, a chronic infection of the gingiva (gums) and supporting tooth structures, has been associated with preterm birth, low birth weight and development of preeclampsia (6, 7). Studies indicate that periodontal infection can result in placental-fetal exposure and, when coupled with a fetal inflammatory response, can lead to preterm delivery (7). Additionally, in a cohort of 164 young, minority, pregnant and postpartum women, the preterm/low birth weight rate was 5.4% lower among women who received periodontal treatment than those who did not receive treatment (7). In a case-control study, researchers found that preeclamptic patients were 3.5 times more likely to have periodontal disease than normotensive patients (6). (See nutrition risk criterion #304 *History of Preeclampsia* for more information.)

Fluoride and Fluorosis

Use of fluorides for the prevention and control of caries is documented to be both safe and highly effective. Fluoride, a naturally occurring substance, has several caries-protective mechanisms of action, including enamel remineralization and altering bacterial metabolism to help prevent caries. Excessive intake of fluoride can cause dental fluorosis, which is a change in the appearance of the tooth's enamel. In the U.S., fluorosis appears mostly in the very mild or mild form - as barely visible lacy white markings or spots. The severe form of dental fluorosis, staining and pitting of the tooth surface, is rare in the U.S. The CDC reports that 32% of American children have some form of dental fluorosis, with 2.45% of children having the moderate to severe stages. (8, 9, 10, 11)

Parents and caregivers may have questions and concerns about fluoride content in water supplies and in infant formula. Fluoridated water can be found in communities that supplement tap water with fluoride and it may also be found in well water. The CDC's *My Water's Fluoride* website: **http://apps.nccd.cdc.gov/MWF/Index.asp,** allows consumers in currently participating States to learn the fluoridation status of their water system.

All formula, including powdered, concentrate and ready-to-feed, contain fluoride, but most infant formula manufacturers ensure low levels of fluoride (8). WIC State and local agencies should refer caregivers of formula fed infants with questions regarding the use of fluoridated vs. non-fluoridated water to prepare infant formula to the infants' health care provider.

Dental Care and Anxiety

It is reported that 50% of the U.S. population does not seek regular dental care. Of the entire U.S. population, 8-15% has dental phobias. Dental fear can be directly learned from previous

painful or negative experiences or indirectly learned from family, friends and the media. Negative portrayal of dentistry by these sources adds to an individual's anxiety. Anxiety and/or fear of dental procedures may prevent participants from seeking necessary dental care during high risk periods of the life cycle (e.g., pregnancy). Dental providers are learning to understand the causes of dental fear, have techniques to assess the level of fear and have modified treatments to accommodate patients with high anxiety levels. (12)

Oral Health Problems and Special Health Care Needs

The following special health care needs can increase the risk for oral health problems and can also make the overall effects of poor oral health more severe (13):

- **Prematurity and intrauterine malnutrition**- can have adverse effects on an individual's oral health. A study of infants who weighed <2000g at birth indicated more porous dental enamel and subsurface lesions. Infants with very low birth weights (<1500g) are more apt to have enamel defects of the primary teeth. Malnutrition in the first few months of life (when oral structures develop) can increase the risk for oral problems.
- **Gastroesophageal Reflux Disease (GERD)-** common among children with cerebral palsy, Down syndrome and other conditions. GERD can contribute to oral health problems. As acidic gastric contents are regurgitated, primary and permanent teeth can be eroded.
- **Failure to thrive and other problems with weight gain and growth-** frequent meals and snacks (which may contribute to caries development) may be needed to maintain an adequate energy intake, or if mealtime is longer than usual, the demineralization period may exceed remineralization. Delayed weaning and children sipping on a bottle throughout the day could also contribute to oral health problems.
- **Craniofacial malformations**– individuals with these malformations are at higher risk of developing oral problems. For example, children with cleft lip/palate disorders have more decayed, missing, and filled teeth than children without.
- **Compromised immune function**- individuals with AIDS or those who take immunosuppressive medications are more susceptible to oral infections such as candidiasis, viral infections, dental caries, and periodontal disease.
- **Down syndrome (Trisomy 21)-** individuals with Down syndrome often have delayed dental development*, may be missing permanent teeth, and may have under-developed teeth or teeth with thin enamel. In addition, the potential for eating problems and GERD make oral care for individuals with Down's especially important. (13)

*Delayed Tooth Eruption (DTE) is the emergence of a tooth into the oral cavity at a time that deviates significantly from norms established for different races, ethnicities, and sexes. Variation in the normal eruption of teeth is a common finding, but significant deviations from established norms should alert the clinician to further investigate the patient's health and development. Eruption depends on genetics, growth of the jaw, muscular action and other factors. DTE is seen in children with certain genetic disorders, particularly Down syndrome, and in children with general developmental delays that involve the oral musculature. Whenever DTE is generalized, the child should be examined for systemic diseases affecting eruption, such as endocrine disorders, organ failures, metabolic disorders, drugs and inherited disorders.

(14) Additional information about tooth eruption is available at:
http://www.ada.org/2930.aspx.

Dentate Status, Diet Quality and General Health

By the time individuals reach adulthood, the human mouth has progressed from 20 primary teeth to 32 permanent (adult) teeth (2). The extent to which tooth loss can adversely affect nutritional status is not completely known. However, diet quality tends to decline as the degree of dental impairment increases. Studies have shown that intake of vitamin A, fiber, calcium and other key nutrients decline as the number of teeth decline. In The Health Professionals study, participants without teeth had diets that contained fewer vegetables, less carotene and fiber, and more cholesterol, saturated fat, and calories than persons with 25 teeth or more (15). Despite the trend toward increased tooth retention throughout adult life in developed countries, 11% of adults aged 25 and older have lost all of their natural teeth. This number increases to 30% for people over age 65 and is even higher in those living in poverty. Loss of teeth is not a normal result of the aging process; the major cause of tooth loss is extractions resulting from dental caries and/or periodontal disease. (15)

Implications for WIC Nutrition Services

To help prevent oral health problems from developing and ensure the best possible health and developmental outcomes, WIC staff can encourage participants and caregivers to:

Diet

- Breastfeed infants during the first year of life and beyond as mutually desired.
- Avoid having an infant/child sleep with a bottle. Any bottle taken to bed should contain only water. (See Risks 425.3 and 411.2)
- Gradually introduce a cup between 6 and 12 months of age, wean from the bottle by 12 months of age.
- Drink/provide only water and milk between meals.
- Limit sugary foods and drinks (if sweets are eaten, it's best to restrict to mealtimes.)
- Avoid carbonated beverages and juice drinks. (See Risk 425.2)
- Limit the intake of 100% fruit juice to no more than 4-6 ounces per day.
- Establish eating patterns that are consistent with the Dietary Guidelines for Americans and the infant feeding practice guidelines of the American Academy of Pediatrics.
- Consume/provide a varied, balanced diet during gestation and throughout childhood to set the stage for optimal oral health. (1,3,4,15)

Oral Hygiene

- Wipe the gums of even a very small infant with a soft washcloth or soft toothbrush, even prior to tooth eruption, to establish a daily oral hygiene routine (17, 18).

- Brush teeth (including an infant's, as soon as teeth erupt) thoroughly twice daily (morning and evening) and floss at least once every day.
- Minimize saliva sharing activities (i.e., sharing a drinking cup and utensils). (1,3,4,15)

Fluoride

- Use fluoride toothpaste approved by the American Dental Association ("pea-size" for 2-5 year olds and, "smear" for under the age of two and at moderate or high caries risk). (1)
- Rinse every night with an alcohol-free over-the- counter mouth rinse with 0.05% sodium fluoride (guidance for woman participant and caregiver only). (3)
- Contact the infant's (if formula fed) health care provider with questions regarding the use of local drinking water or bottled water to prepare infant formula. (3)
- Talk to the dentist about fluoride supplements. These may be of benefit in reducing dental decay for children living in fluoride-deficient areas (See Risk 411.11).
- Check if the public water systems have added fluoride at: **http://apps.nccd.cdc.gov/MWF/Index.asp.**
- Access the following website for more information about fluoride: **http://www.cdc.gov/fluoridation/safety.htm .**

Referrals

- Establish a dental home within 6 months of eruption of the first tooth and no later than 12 months of age. (3)
- See a dentist for examinations (every 6 months) and/or restoration of all active decay as soon as possible. (WIC staff should provide dental referrals as necessary.)

Oral Health Resources/Handouts

- Summary of Pediatric Oral Health Anticipatory Guidance: **http://www.aafp.org/afp/2004/1201/p2113.html#afp20041201p2113-t2.**
- Table: Oral health and dietary management for mothers and children (see page 3 of pdf.) **http://www.sciencedirect.com/science/article/pii/S0002822398000443.**
- Oral Health Care During Pregnancy: A National Consensus Statement: **http://www.mchoralhealth.org/materials/consensus_statement.html.**
- *Your Baby's Teeth:* **http://www.aafp.org/afp/2004/1201/p2121.html.**
- *Two Healthy Smiles: Tips to Keep You and Your Baby Healthy:* **http://www.mchoralhealth.org/PDFs/pregnancybrochure.pdf.**
- *Tips for Good Oral Health Care During Pregnancy:* **http://www.mchoralhealth.org/PDFs/OralHealthPregnancyHandout.pdf.**

High Risk

Not applicable

Additional Counseling Guidelines

- Explain risks associated with dental problems
  - In adults:
    - Missing teeth affects the chewing ability and nutritional intake
    - For pregnant women with gingivitis there is an increased risk of pre-term low birth weight as a result of preterm labor or premature rupture of the membranes
  - In children:
    - Increased risk of primary tooth loss
    - Possible feeding problems
    - Damage to permanent teeth
    - Potential speech problems
- Emphasize correcting inappropriate dental feeding practices and teaching participant preventative practices
  - For infants:
    - Hold infant for bottle and breast feedings
    - Do not allow the infant/toddler to sleep with the bottle or use it unsupervised during waking times
    - Wipe infant's gums with a soft cloth after feeding
    - Introduce foods, beverages and meals/snacking behaviors that promote oral health (i.e. fruit juices in a cup)
- For women and children:
  - Eating frequency is associated with caries risk
  - Drink water to satisfy thirst and hydration needs
  - Limit consumption of sweetened beverages
    - Consume them with meals and snacks that contain other foods (such as proteins) which can buffer them
  - The more times a day the child consumes solid or liquid food, the higher the caries risk
    - Caregivers should be counseled to offer structured meal and snack patterns

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

382 Fetal Alcohol Spectrum Disorders

Definition/Cut-Off Value

Fetal alcohol spectrum disorders (FASDs) are a group of conditions that can occur in a person whose mother consumed alcohol during pregnancy (1). FASDs is an overarching phrase that encompasses a range of possible diagnoses, including fetal alcohol syndrome (FAS), partial fetal alcohol syndrome (pFAS), alcohol related birth defects (ARBD), alcohol-related neurodevelopmental disorder (ARND), and neurobehavioral disorder associated with prenatal alcohol exposure (ND-PAE) (2).

Presence of condition diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant Women	I	Y
Breastfeeding Women	I	Y
Not Breastfeeding woman	III, IV, V, or VI	Y
Infants	I	Y
Children	III	Y

Parameters for manual assignment

Must be manually selected in the Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

Prenatal exposure to alcohol can damage the developing fetus and is the leading preventable cause of birth defects and intellectual and neurodevelopmental disabilities (2). (See risk #372 Alcohol and Substance Use for more information.) FASD is an umbrella term describing the range of effects that can occur in an individual whose mother consumed alcohol during pregnancy (2). These effects include physical, mental, behavioral, and/or learning disabilities with possible lifelong implications (1, 2). Often, a person with FASD has a mix of these conditions (1). The term FASDs is not meant for use as a clinical diagnosis and encompasses all other diagnostic terms, such as fetal alcohol syndrome (FAS) (1, 2). FASDs refer to the whole range of effects that can occur in a person whose mother consumed alcohol during

pregnancy. These conditions can affect each person in different ways and can range from mild to severe. A person with FASD might have any or a combination of the following conditions (1):

• Facial abnormalities, such as a smooth ridge between the nose and upper lip (this ridge is called the philtrum).

• Small head size, short stature, low body weight.

• Sleep and sucking problems as an infant

• Hyperactive behavior, difficulty with attention, poor memory, difficulty in school (especially with math), learning disabilities, poor reasoning and judgment skills.

• Poor coordination, speech and language delays, intellectual disability or low IQ.

• Problems with the heart, kidneys, bones, vision, or hearing.

The severity of alcohol's effects on a fetus primarily depends on the following (3, 4):

• Quantity – the amount of alcohol consumed by a pregnant woman per occasion.

• Frequency – the rate at which alcohol is consumed or is repeatedly consumed by the pregnant woman.

• Timing – the specific gestational age of the fetus when alcohol is consumed by the pregnant woman.

Fetal Alcohol Spectrum Disorders Diagnoses

Different terms are used to describe FASDs, depending on the type of symptoms.

Fetal Alcohol Syndrome (FAS) was the first form of FASD discovered and is the most well-known. It represents the most involved end of the FASD spectrum. A diagnosis of FAS requires evidence of prenatal alcohol exposure; evidence of central nervous system (CNS) abnormalities (structural or functional); a specific pattern of the following three facial abnormalities: narrow eye openings, a smooth area between the lip and the nose (vs. the normal ridge), and a thin upper lip; and growth deficits either prenatally, after birth, or both (1). Fetal Alcohol Syndrome can affect children in different ways. A child with FAS may have problems with learning, memory, attention span, communication, vision, and/or hearing (3). Also, people with FAS often have a hard time in school and trouble getting along with others (1).

The Centers for Disease Control and Prevention worked with a group of experts and organizations to review the research and issued guidelines for diagnosing FAS in 2004. The guidelines were developed for FAS only. Diagnosing FAS can be challenging due to other medical disorders, such as attention deficit/hyperactivity disorder (ADHD) and Williams syndrome, having similar symptoms and the lack of standard medical tests. (1)

Partial FAS (pFAS) involves prenatal alcohol exposure and includes some, but not all, of the characteristics of full FAS (3). A diagnosis of pFAS requires a confirmed history of prenatal

alcohol exposure and CNS abnormalities at the same level as FAS. Individuals with pFAS sometimes have growth deficiency or one or more of the facial abnormalities associated with FAS. Individuals with pFAS have the same functional disabilities but may not have the physical appearance of an individual with FAS (5).

Alcohol-Related Neurodevelopmental Disorder (ARND) requires evidence of both prenatal alcohol exposure and CNS abnormalities, which may be structural or functional. Functional abnormalities may involve a complex pattern of cognitive or behavioral problems that are not consistent with developmental level and that cannot be explained by factors other than prenatal alcohol exposure (e.g., family background, environment, and other toxicities). Facial abnormalities and growth deficits need not be present (3). People with ARND might have intellectual disabilities and problems with behavior and learning. They might do poorly in school and have difficulties with math, memory, attention, judgment, and impulse control (1).

Alcohol-Related Birth Defects (ARBD) include problems with the heart, kidneys, bones, or hearing. People with ARBDs might have a combination of these (1). ARBD is rarely seen alone but rather as a secondary disorder accompanying other FASD conditions (e.g., FAS and ARBD) (3).

Neurobehavioral Disorder Associated with Prenatal Alcohol Exposure (ND-PAE) was first included as a recognized condition in the Diagnostic and Statistical Manual 5 of the American Psychiatric Association (APA) in 2013. ND-PAE requires evidence of both prenatal alcohol exposure and CNS involvement, as indicated by impairments in the following three areas: cognition, self-regulation, and adaptive functioning. A child or youth with ND-PAE will have problems in three areas: 1) thinking and memory, where the child may have trouble planning or may forget material he or she has already learned; 2) behavior problems, such as severe tantrums, mood issues (for example, irritability), and difficulty shifting attention from one task to another; and 3) trouble with day-to-day living, which can include problems with bathing, dressing for the weather, and playing with other children. In addition to the child having problems in these three areas, the mother of the child must have consumed more than minimal levels of alcohol during pregnancy. The APA defines minimal levels of alcohol as more than 13 alcoholic drinks per month of pregnancy (that is, any 30-day period of pregnancy) or more than 2 alcoholic drinks in one sitting. (1, 3)

Prenatal Alcohol Exposure (PAE) may be associated with altered acquisition and distribution of body mass with increasing age. In a study conducted by Werts and colleagues, the exploratory data suggested that children with PAE may be at risk for nutritional deficiencies, which are influenced by inappropriate food preferences, disordered eating patterns, medication use, and the stressful dynamics surrounding food preparation and mealtime. PAE may be associated with female obesity, constant snacking, lack of satiety, constipation, and low vitamin D status. The obesity/overweight incidence for the female subjects was 50% (a rate substantially greater than the U.S. average of 31.3%), while the obesity/overweight incidence for the males was well below the U.S. average. The sample size was too small to determine whether obesity rates significantly differed between the sexes. (6)

Fetal Alcohol Effects (FAE) was previously used to describe intellectual disabilities and problems with behavior and learning in a person whose mother consumed alcohol during pregnancy. In 1996, the Institute of Medicine (IOM) replaced FAE with the terms alcohol-related neurodevelopmental disorder (ARND) and alcohol-related birth defects (ARBD). (1)

Growth and Development of Children with FASD

The estimated prevalence of FASD in populations of first-grade schoolchildren (~6.5-7.8 years old) is as high as 20-50 per 1,000 in the United States and some Western European countries. (7) In a study conducted by Spohr and others, it was found that although the characteristic craniofacial malformations of FAS/FAE diminished over time, microcephaly, a poorly developed philtrum, a thin upper lip, and, to a lesser degree, short stature and underweight (in boys) persisted. In females, adult body weight increased. Although some catch-up growth occurred, a large proportion of the subjects had growth deficiency. (8)

Retrospective research demonstrated that children may be more affected by prenatal alcohol exposure based on the following variables regarding the mother (3, 4):

• Poor pre-pregnancy or prenatal nutrition

• Multiple pregnancies and births

• Lower-than-average pre-pregnancy or prenatal weight, height, and body mass index (BMI)

• Maternal smoking

• Maternal age (effect on child increases with mother's age)

• Has family members or peers who drink heavily

One study indicated that, anecdotally, children with FASD are often "picky eaters", some have autistic-like taste and texture sensitivities, and many have behavioral challenges such as rigidity and oppositionality. Children with FASD had lower intakes of saturated fats, vitamin D, and calcium. They may not meet the recommended intakes for several nutrients and have a dietary pattern that could benefit from improving intakes of dairy products, green leafy vegetables, vegetable oils, nuts, eggs, and fish. Most (>50%) did not meet the Adequate Intake for fiber, n-3 fatty acids, vitamin K, or choline, or the Recommended Dietary Allowance for vitamin D, vitamin E, or calcium. (9)

Another study indicated that children with FASD were more likely to have a past diagnosis of underweight. Mean BMI was significantly reduced for males but not females. Abnormal eating patterns are common in children with FASD and may contribute to their delayed growth and nutritional inadequacies. Children with FASD were significantly more likely to experience delayed acquisition of age-appropriate eating skills, compared with controls. The median age for solid foods introduction was significantly older for children with FASD as was their age at self-feeding. (10)

Breastfeeding may prevent or improve neurodevelopmental disorders for children with FASD and has been shown to improve IQ (11, 12). Infants with facial abnormalities may have breastfeeding challenges such as difficulty with latch, sucking, or swallowing; and individualized breastfeeding support will likely be needed (13). (See risk #372 Alcohol and Substance Use for more information regarding breastfeeding and alcohol use.)

There is no cure for FASDs, but research shows that early intervention treatment services can improve a child's development. There are many types of treatment options, including medication to help with some symptoms, behavior and education therapy, parent training, and other alternative approaches. Certain protective factors can help reduce the effects of FASD and help people with these conditions reach their full potential. Protective factors include diagnosis before 6 years of age; loving, nurturing, and stable home environment during the school years; absence of violence; and involvement in special education and social services. (1)

Adults with FASD

FASDs last a lifetime. Research to date indicates that, compared to controls, adults with FASDs have increased behavioral problems; are perhaps less efficient and more distractible when completing tasks; have more difficulty with paying attention, learning, memory, planning, and analyzing social situations; and feel less confident that they have sufficient resources to cope with their environment. Adults with FASDs have a high rate of psychiatric and personality disorders, problems with drugs and alcohol, and difficulties with the law. They are also less likely to obtain a degree, have stable employment, and live independently. Young adults with PAE have increased risks for mental health problems and secondary disabilities, which impacts their ability to live independently. (1, 14)

Justification for High Risk

FASD has severe consequences and is defined by damage to the central nervous sytem, the presence of at least two facial abnormalities, and growth retardation. These consequences significantly inhibit normal growth, cause developmental delay, and affect the overall quality of life for these children. Complications that are often made manifest in children with FASD are failure to thrive, poor growth throughout childhood, and poor suck in the infant.

There is no cure for FASD and prevention is the only answer. Therefore, the recommendation is not to drink any alcoholic beverage during pregnancy. There are certain common characteristics among mothers who have give birth to a child with fetal alcohol spectrum disorders including: the mother being unmarried, unemployed, an ethnic minority, older, living in poverty, or without prenatal care. These mothers are also more likely to have lower education levels, be on public assistance or Medicaid, and smoke or use illicit drugs during pregnancy . With a history of alcohol or substance abuse these mothers may also be deficient in nutritents. WIC can provide supplemental foods, nutrition education and referrals to medical and social services which can monitor and provide assistance to the family.

Implications for WIC Nutrition Services

When speaking with a biological mother of a child with an FASD, the American Academy of Pediatrics recommends the following (15):

• Building a rapport with the mother and allow her to express her emotions and concerns related to her child's health and the demands of parenting a child with an FASD.

• Reaffirming the parent as a key part of the child's care team.

• Keeping all lines of communication and advocacy open as the child's care is coordinated through the medical home.

• Referring to the National Organization on Fetal Alcohol Syndrome's Circle of Hope Birth Mother's Network that can be contacted in person or online: https://www.nofas.org/circleofhope/.

WIC staff can assist parents/caregivers of infants and children with FASD by:

• Providing anthropometric monitoring to address underweight, delayed growth, nutritional inadequacies, or overweight issues and concerns.

• Providing individualized food packages tailored to meet the needs of participants.

• Providing nutrition information regarding how to improve the intake of dairy products, green leafy vegetables, vegetable oils, nuts, eggs and fish when appropriate as this may be beneficial (9).

• Providing nutrition guidance to help with making appropriate choices for healthy snacks and satiety.

• Providing suggestions for addressing age-appropriate feeding skills and behavioral and developmental issues associated with feeding.

• Encouraging physical activity as it improves glucose tolerance, muscle development, motor coordination, and may stimulate neurogenesis and synaptogenesis (10).

• Referring to their health care provider to discuss nutritional supplements and any growth and development concerns (3).

• Providing referrals to promote caregiver and infant/child feeding skills, including referrals to local home visiting programs, parenting programs, and early intervention services.

• Referring to their health care provider for breastfeeding support. These infants may need frequent growth monitoring and re-evaluation of their feeding capacity, so feeding plans will need to be adjusted accordingly. (13)

WIC staff can assist adult participants with FASD by (also see risk #902 Woman or Infant/Child of Primary Caregiver with Limited Ability to Make Appropriate Feeding Decisions and/or Prepare Food):

• Providing individualized nutrition education in an easy-to-understand format that is appropriate for the learning level of the participant/caregiver. Most education materials should be written for a 5th to 7th grade reading level. Be sensitive to the unique learning needs and style of the participant/caregiver, which may mean using food models, posters, and handouts.

• Providing referrals to promote parenting and infant/child feeding skills, including referrals to local home visiting programs, parenting programs, and early intervention services.

• Encouraging participants/caregivers to follow health care provider's plan of care. Coordinate with health care providers as needed.

• Providing individualized food packages, tailored to meet the needs of participants. Some adults with FASD with a limited ability to make appropriate feeding decisions/prepare food may be unable to prepare powder or concentrated infant formula. Thus, for the safety of the infant, State WIC Agencies may allow ready-to-feed (RTF) WIC formulas to be issued when it is determined that the caregiver may have difficulty correctly diluting powder or concentrated formulas. Please refer to your State WIC Agency's specific policies regarding the issuance of RTF, as policies vary from state to state.

• Referring to their health care provider to discuss nutritional supplements for pregnant women (3).

• Referring to Substance Use and Prevention Manual: Screening, Education and Referral Resource Guide for Local WIC agencies. Available from: https://wicworks.fns.usda.gov/resources/wic-substance-use-prevention-guide.

Additional Counseling Guidelines

- Explain risks associated with FAS:
    - Irreversible birth defects
    - Failure to thrive
    - Pattern of poor growth throughout childhood
    - Poor suck (for infants)
    - Babies are also more irritable, have difficulty feeding and sleeping
    - Poor appetite due to slower rate of growth
    - May lead to feeding behavioral problems
    - Delays in feeding skills due to slower rate of growth
    - Auditory and vision problems
    - Malformed and misaligned secondary teeth
    - Learning difficulties
    - Language delays
    - Attention deficit disorders

- All of above risks place child at risk for poor nutrition
- If appropriate, discuss extra family stress of a special needs child
- Counsel on ways to provide adequate diet and nutritional intake for age and developmental level
- Special consideration should be given to:
    - Feeding skill level and appropriate textures
    - Meal planning and infant food preparation
    - Feeding and mealtimes
        - If child has short attention span, more feeding times may be appropriate
        - If excessive weight gain is a problem in children, stress lower caloric food choices and exercise

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has...") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

383 Neonatal Abstinence Syndrome

Definition/Cut-off Value

Neonatal abstinence syndrome (NAS) is a drug withdrawal syndrome that occurs among drug-exposed (primarily opioid-exposed) infants as a result of the mother's use of drugs during pregnancy (1). NAS is a combination of physiologic and neurologic symptoms that can be identified immediately after birth and can last up to 6 months after birth (2,3).

This condition must be present within the first 6 months of birth and diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by the infant's caregiver. See the clarification section for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	Risk
Infants	I	N

Justification

Neonatal abstinence syndrome occurs when an infant is born dependent on prescription or illicit drugs the mother was taking during pregnancy. NAS is a combination of withdrawal symptoms that involve multiple bodily systems. It is most commonly associated with chronic opioid exposure during fetal development; however, can also result from chronic intrauterine exposure to other substances including: benzodiazepines, barbiturates, selective serotonin reuptake inhibitors and ethanol (3). Although these non- opioid substances can lead to NAS, these infants typically respond well to non-pharmacological methods of intervention (4).

Withdrawal in the newborn varies based on the type of substance, dose, and timing of exposure (4). Opioid is a general term for a variety of illicit and prescription drugs that decrease pain. Prescription opioid pain relievers include oxycodone, hydrocodone, codeine, morphine, and fentanyl. Opioids are water soluble and are, therefore, able to move easily across the placenta to the infant. This transfer of opioids increases as gestational age increases (3).

Heroin is an illegal opioid that is synthesized from morphine and can be injected, inhaled, or smoked. About 23% of individuals who use heroin become dependent (5). Furthermore, those who take any form of opioid, including prescription opioids as directed for chronic pain, can become addicted. Due to the risk of the transmission of infectious diseases such as Human Immunodeficiency Virus (HIV) and Hepatitis C, women who become pregnant while using illicit opioids, such as heroin, are often put on opioid maintenance therapy. Opioid maintenance therapy involves the prescribed use of either methadone or buprenorphine. These prescribed opioids can still lead to NAS; however, since they are not injected, they

decrease the risk of the mother contracting blood borne infectious diseases. Opioid maintenance therapy can also help protect the fetus from repeated opioid withdrawal in utero (6).

The incidence of NAS has increased from 1.2 to 3.39 per 1,000 live births from 2000 to 2009 in the United States. This increased incidence is due to an increase in antepartum opioid use from 1.19 to 5.63 per 1,000 live births in the same period (7). In another study, it was reported that 5.9% of all women who were pregnant in 2012 reported some illicit drug use during pregnancy (4). Infants born with NAS are often premature, have low birth weights, and are growth-restricted (see risks #142 *Preterm or Early Term Delivery*, #141 *Low Birth Weight*, and #151 *Small for Gestational Age* for more information about these conditions). (3) In addition to the concerns of exposure to substances in utero, additional factors, including social, nutritional, physical, and mental health problems can also contribute to the health status of the infant. An increased risk of certain birth defects has also been associated with early pregnancy opioid use (8). These birth defects include: spina bifida, hydrocephaly, glaucoma, gastroschisis, and heart defects (9).

Neonatal Abstinence Syndrome Symptoms

Symptoms of NAS generally involve the central nervous system, autonomic nervous system, and the gastrointestinal tract (3). The severity of the infant's symptoms is commonly assessed using the Modified Finnegan Score Sheet. The Modified Finnegan Score Sheet consists of 21 symptoms that are associated with NAS. Following the determination of a baseline score, infants are assessed every 4 hours unless the severity of the symptoms requires more frequent monitoring (10). The following list includes symptoms associated with NAS (1, 6):

- Loud, high-pitched crying
- Sweating
- Yawning
- Sleep disturbances
- Feeding difficulties
- Poor weight gain
- Excessive sucking
- Regurgitation
- Diarrhea

Neonatal Abstinence Syndrome Treatment

Infants with NAS typically have longer hospital stays, can experience serious complications, and have costly treatment (2). The first treatment option for infants with NAS is to manage symptoms without medication by rooming in with the mother, encouraging skin-to-skin contact, swaddling, having a calm environment, avoiding overstimulation, and supporting breastfeeding (11). Infants who are at risk for NAS and who room-in with their mothers are not only at a lower risk of needing pharmacological treatment for NAS, but they also have a shortened hospital stay (12). If withdrawal is severe or if the initial treatment is not successful in managing symptoms of NAS, medications such as morphine, methadone, phenobarbital or clonidine may be used. An infant given these medications may have side effects that could include: slow or shallow breathing, slow heart rate, difficulty waking-up, excessive sleepiness, constipation, and fewer wet diapers (11).

Nutritional Considerations for Neonatal Abstinence Syndrome

The timing and type of feedings play an important role in the management of NAS symptoms. Infants with NAS may have impaired feeding behaviors such as excessive sucking, regurgitation, diarrhea and poor feeding that is characterized by fussiness, crying, and sleepiness (13, 14). Infants with NAS have higher caloric requirements due to their energy expenditure. This combined with the impaired feeding behaviors may result in difficulty with weight gain (14). The American Academy of Pediatrics (AAP) recommends breastfeeding if not contraindicated (15). The AAP also recommends that infants with NAS be fed frequent small volumes of human milk or high calorie formula, as needed, in a quiet and calm environment, to aid the infant in tolerating feedings and improving digestion and to allow for adequate growth (11, 15).

The Academy of Breastfeeding Medicine recommends breastfeeding for women who are on a prescribed stable dose of methadone maintenance because the concentrations of methadone in human milk are low (16). Studies have indicated that, although the amount of methadone in human milk is dependent on the mother's dose, the methadone transferred in human milk averages less than 2.8% of the maternal dose (17). Breastfeeding has been found to provide protection against the development of NAS symptoms and lessen the severity of symptoms, which would decrease the need for pharmacological intervention for the infant (18, 19, 20). The amount of methadone that is in human milk is small and therefore, it is thought that breastfeeding, and not the methadone in human milk, is responsible for its protective impact against NAS (18). Gradual weaning, when mutually desired by the mother and infant, is recommended for breastfeeding women who are being treated for opioid addiction. Gradual weaning (rather than an abrupt stop to breastfeeding) decreases the risk of the infant developing NAS (11, 17).

Implications for WIC Nutrition Services

NAS can be a difficult subject to talk about with WIC participants due to the stigma of addiction. In the WIC clinic, caregivers may not be forthcoming with the infant's diagnosis of NAS and an addiction history of the mother may not be available at the initial assessment. WIC staff can assist caregivers by:

- Educating to recognize infant hunger cues.
- Reviewing feeding frequency and/or formula type and amount to help manage gastrointestinal symptoms of NAS.
- Providing growth monitoring to assess adequate weight gain.
- Encouraging supportive interventions to include:
    - Skin-to-skin contact
    - Swaddling
    - Quiet environment with little stimulation
- Encouraging breastfeeding unless medically contraindicated.
- Providing referrals for support services such as drug and alcohol counseling, parenting support, and medical evaluations.
- Encouraging mothers who are on medication-assisted therapy (e.g., methadone or buprenorphine) and who are breastfeeding, to speak with their health care provider if they have questions about the timing and dose of their medication.
- Educating mothers who are on medication-assisted therapy and who are breastfeeding on the importance of gradual weaning when mutually desired by the mother and infant.

Justification for High Risk

Not Applicable

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has…”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

401 Failure to Meet Dietary Guidelines for Americans

Definition/Cut-Off Value

Women and children two years of age and older who meet the income, categorical, and residency eligibility requirements may be presumed to be at nutrition risk for *failure to meet Dietary Guidelines for Americans [Dietary Guidelines]* (1). Based on an individual's estimated energy needs, the *failure to meet Dietary Guidelines* risk criterion is defined as consuming fewer than the recommended number of servings from one or more of the basic food groups (grains, fruits, vegetables, milk products, and meat or beans)

Note: The *Failure to meet Dietary Guidelines for Americans* risk criterion can only be used when a complete nutrition assessment has been completed **and** no other risk criteria have been identified. This includes assessing for risk #425, *Inappropriate Nutrition Practices for Children* or risk #427, *Inappropriate Nutrition Practices for Women*.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant Women	IV	N
Breastfeeding Women	IV	N
Not Breastfeeding woman	VI	N
Children > 2 years of age	V	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification

The 1996 Institute of Medicine (IOM) report, *WIC Nutrition Risk Criteria: A Scientific Assessment,* raised questions on the quality of traditional dietary assessment methods (e.g., 24-hour recall and food frequency questionnaires) and recommended further research on the development and validation of diet assessment methodologies (2). In response to the 1996 IOM report, the Food and Nutrition Service (FNS) commissioned the IOM to review the use of various dietary assessment tools and to make recommendations for assessing inadequate diet or inappropriate dietary patterns, especially in the category of f*ailure to meet Dietary Guidelines* (see Clarification) (3).
The IOM Committee on Dietary Risk Assessment in the WIC Program approached this task by using the Food Guide Pyramid* recommended number of servings, based on energy needs, as

cut-off points for each of the five basic food groups to determine if individuals were meeting the *Dietary Guidelines*. As a result of the review of the cut-off points for food groups and dietary assessment methods, the IOM published the 2002 report, *Dietary Risk Assessment in the WIC Program*. The IOM Committee's findings related to dietary risk, the summary evidence, and the Committee's concluding recommendation are provided below. (4)

IOM Committee Findings Related to Dietary Risk (4) (For more information, refer to the specific pages listed.)

• A dietary risk criterion that uses the WIC applicant's usual intake of the five basic Pyramid* food groups as the indicator and the recommended number of servings based on energy needs as the cut-off points is consistent with *failure to meet Dietary Guidelines.* (page 130)

• Nearly all U.S. women and children usually consume fewer than the recommended number of servings specified by the Food Guide Pyramid* and, therefore, would be at dietary risk based on the criterion *failure to meet Dietary Guidelines*. (page 130)

• Even research-quality dietary assessment methods are not sufficiently accurate or precise to distinguish an **individual's** eligibility status using criteria based on the Food Guide Pyramid* or on nutrient intake. (page 131)

Summary Evidence Supporting a Presumed Dietary Risk Criterion (4)
(For more information, refer to the specific page listed.)

• Less than 1 percent of all women meet recommendations for all five Pyramid* groups. (page 127)

• Less than 1 percent of children ages 2 to 5 years meet recommendations for all five Pyramid* groups. (page 127)

• The percentage of women consuming fruit during 3 days of intake increases with increasing income level. (page 127)

• Members of low-income households are less likely to meet recommendations than are more affluent households. (page 127)

• Food-insecure mothers are less likely to meet recommendations for fruit and vegetable intake than are food-secure mothers. (page 127)

• The percentage of children meeting recommendations for fat and saturated fat as a percentage of food energy increases with increasing income level. (page 127)

• Low-income individuals and African Americans have lower mean Healthy Eating Index scores than do other income and racial/ethnic groups. (page 127)

**The Food Guide Pyramid was the Dietary Guidelines icon at the time the 2002 IOM Committee on Dietary Risk Assessment in the WIC Program conducted the review. The Dietary Guidelines icon has been changed to MyPlate. Although the icon has changed, the Findings and the*

Supporting Research are still applicable to this criterion. Please see Clarification for more information.

Summary Evidence Suggesting that Dietary Assessment Methods are Not Sufficient to Determine a WIC Applicant's Dietary Risk (4)
(For more information, refer to the specific page listed.)

• 24-hour diet recalls and food records are not good measures of an individual's usual intake unless a number of independent days are observed. (page 61)

• On average, 24-hour diet recalls and food records tend to underestimate usual intake–energy intake in particular. (page 61)

• Food Frequency Questionnaires and diet histories tend to overestimate mean energy intakes. (page 61)

IOM Committee Concluding Recommendation (4)
(For more information, refer to the specific page listed.)

"In summary, evidence exists to conclude that nearly all low-income women in the childbearing years and children ages 2 to 5 years are at dietary risk, are vulnerable to nutrition insults, and may benefit from WIC's services. Further, due to the complex nature of dietary patterns, it is unlikely that a tool will be developed to fulfill its intended purpose with WIC, i.e., to classify individuals accurately with respect to their true dietary risks. Thus, any tools adopted would result in misclassification of the eligibility status of some, potentially many, individuals. By presuming that all who meet the Program's categorical and income eligibility requirements are at dietary risk, WIC retains its potential for preventing and correcting nutrition-related problems while avoiding serious misclassification errors that could lead to denial of services to eligible individuals." (page 135)

Implications for WIC Nutrition Services

As indicated in the 2002 IOM report, most Americans (including most WIC participants) fail to adhere to the *Dietary Guidelines*. Through participant-centered counseling, WIC staff can:
• Guide the participant in choosing healthy foods and age-appropriate physical activities as recommended in the *Dietary Guidelines*.
• Reinforce positive lifestyle behaviors that lead to positive health outcomes.
• Discuss nutrition-related topics of interest to the participant such as food shopping, meal preparation, feeding relationships, and family meals.
• Refer participants, as appropriate, to the Supplemental Nutrition Assistance Program (SNAP), community food banks and other available nutrition assistance programs.

Clarification

The recommendation and findings of the IOM Committee were developed using the *2000 Dietary Guidelines* as the standard for a healthy diet. Subsequent to the 2002 IOM report, the *Dietary Guidelines* have been updated with the release of the *2005 and 2010 Dietary Guidelines*. Although the subsequent editions of the *Dietary Guidelines* are different from the 2000 edition, there is no evidence to suggest that the 2002 IOM recommendation and findings are invalid or inaccurate. The fact remains that diet assessment methodologies may not reflect usual intakes and therefore are insufficient to determine an individual's eligibility status. In addition, future research will be necessary to determine if there is a change in the IOM finding that nearly all Americans fail to consume the number of servings from the basic food groups as recommended in the *Dietary Guidelines*

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

None

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411 Inappropriate Nutrition Practices for Infants

Definition/Cut-Off Value

Routine use of feeding practices that may result in impaired nutrient status, disease, or health problems. These practices, with examples, are outlined below.
(See 411: A-K)

Participant Category and Priority Level

Category	Priority	High Risk
Infants	IV	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Inappropriate Nutrition Practices for Infants	Examples of Inappropriate Nutrition Practices (including but not limited to)
411a Routinely using a substitute(s) for breast milk or for FDA approved iron-fortified formula as the primary nutrient source during the first year of life.	Examples of substitutes: ▪ Low iron formula without iron supplementation; ▪ Cow's milk, goat's milk, or sheep's milk (whole, reduced fat, low-fat, skim), canned evaporated or sweetened condensed milk; and ▪ Imitation or substitute milks (such as rice- or soy-based beverages, non-dairy creamer), or other "homemade concoctions."
411b Routinely using nursing bottles or cups improperly.	▪ Using a bottle to feed fruit juice. ▪ Feeding any sugar-containing fluids, such as soda/soft drinks, gelatin water, corn syrup solutions, sweetened tea. ▪ Allowing the infant to fall asleep or be put to bed with a bottle at naps or bedtime. ▪ Allowing the infant to use the bottle without restriction (e.g., walking around with a bottle) or as a pacifier. ▪ Propping the bottle when feeding.

Inappropriate Nutrition Practices for Infants	Examples of Inappropriate Nutrition Practices (including but not limited to)
	▪ Allowing an infant to carry around and drink throughout the day from a covered or training cup. ▪ Adding any food (cereal or other solid foods) to the infant's bottle.
411c Routinely offering complementary foods* or other substances that are inappropriate in type or timing. **Complementary foods are any foods or beverages other than human milk or infant formula.*	Examples of inappropriate complementary foods: ▪ Adding sweet agents such as sugar, honey, or syrups to any beverage (including water) or prepared food, or used on a pacifier; and ▪ Introducing any food other than human milk or iron- fortified infant formula before 6 months of age.
411d Routinely using feeding practices that disregard the developmental needs or stage of the infant.	▪ Inability to recognize, insensitivity to, or disregarding the infant's cues for hunger and satiety (e.g., forcing an infant to eat a certain type and/or amount of food or beverage or ignoring an infant's hunger cues). ▪ Feeding foods of inappropriate consistency, size, or shape that put infants at risk of choking. ▪ Not supporting an infant's need for growing independence with self-feeding (e.g., solely spoon-feeding an infant who is able and ready to finger-feed and/or try self-feeding with appropriate utensils). ▪ Feeding an infant foods with inappropriate textures based on his/her developmental stage (e.g., feeding primarily pureed or liquid foods when the infant is ready and capable of eating mashed, chopped or appropriate finger foods).
411e Feeding foods to an infant that could be contaminated with harmful	Examples of potentially harmful foods for an infant: ▪ Unpasteurized fruit or vegetable juice;

Inappropriate Nutrition Practices for Infants	Examples of Inappropriate Nutrition Practices (including but not limited to)
microorganisms or toxins	▪ Unpasteurized dairy products or soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese; ▪ Honey ▪ Raw or undercooked meat, fish, poultry, or eggs; ▪ Raw vegetable sprouts (alfalfa, clover, bean, and radish); ▪ Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot). ▪ Donor human milk acquired directly from individuals or the Internet.
411f Routinely feeding inappropriately diluted formula.	▪ Failure to follow manufacturer's dilution instructions (to include stretching formula for household economic reasons). ▪ Failure to follow specific instructions accompanying a prescription.
411g Routinely limiting the frequency of nursing of the exclusively breastfed infant when human milk is the sole source of nutrients.	Examples of inappropriate frequency of nursing: • Scheduled feedings instead of demand feedings; and • Less than 8 feedings in 24 hours if less than 2 months of age.
411h Routinely feeding a diet very low in calories and/or essential nutrients.	Examples: ▪ Strict Vegan diet; ▪ Macrobiotic diet; and ▪ Other diets very low in calories and/or essential nutrients.
411i Routinely using inappropriate sanitation in preparation, handling, and storage of expressed breast milk or formula.	Limited or no access to a: • Safe water supply (documented by appropriate officials e.g., municipal or health department authorities); • Heat source for sterilization; and/or • Refrigerator or freezer for storage. Failure to prepare, handle, and store bottles, storage containers or breast pumps properly; examples include: Human Milk

Inappropriate Nutrition Practices for Infants		Examples of Inappropriate Nutrition Practices (including but not limited to)
		• Thawing/heating in a microwave • Refreezing • Adding freshly expressed unrefrigerated human milk to frozen human milk • Adding freshly pumped chilled human milk to frozen human milk in an amount that is greater than the amount of frozen human milk • Feeding thawed refrigerated human milk more than 24 hours after it was thawed • Saving human milk from a used bottled for another feeding • Failure to clean breast pump per manufacturer's instruction • Feeding donor human milk acquired directly from individuals or the Internet. Formula • Failure to prepare and/or store formula per manufacturers or physician instructions • Storing at room temperature for more than 1 hour • Using formula in a bottle one hour after the start of a feeding • Saving formula from a used bottle for another feeding • Failure to clean baby bottle properly
411j	Feeding dietary supplements with potentially harmful consequences.	Examples of dietary supplements, which when fed in excess of recommended dosage, may be toxic or have harmful consequences: ▪ Single or multi-vitamins; ▪ Mineral supplements; and ▪ Herbal or botanical supplements/remedies/teas.
411k	Routinely not providing dietary supplements recognized as essential by national	▪ Infants who are 6 months of age or older who are ingesting less than 0.25 mg of fluoride daily when the water supply contains less than 0.3 ppm fluoride.

Inappropriate Nutrition Practices for Infants	Examples of Inappropriate Nutrition Practices (including but not limited to)
public health policy when an infant's diet alone cannot meet nutrient requirements.	▪ Infants who are exclusively breastfed, or who are ingesting less than 1 liter (or 1 quart) per day of vitamin D-fortified formula, and are not taking a supplement of 400 IU of vitamin D.

Justification

411.a Routinely using a substitute(s) for breast milk or for FDA approved iron- fortified formula as the primary nutrient source during the first year of life.

During the first year of life, breastfeeding is the normative standard method of infant feeding. The American Academy of Pediatrics (AAP) recommends human milk for the first 12 months of life because of its acknowledged benefits to infant nutrition, gastrointestinal function, host defense, and psychological well-being (1). In addition, the AAP has established exclusive breastfeeding as the standard against which all alternative feeding methods must be measured with regard to growth, health, development, and all other short and long-term outcomes for children (2). For infants fed infant formula, iron-fortified formula is generally recommended as a substitute for breastfeeding (1- 5). Rapid growth and increased physical activity significantly increase the need for iron and utilize iron stores (1). Body stores are insufficient to meet the increased iron needs making it necessary for the infant to receive a dependable source of iron to prevent iron deficiency anemia (1). Iron deficiency anemia is associated with cognitive and psychomotor impairments that may be irreversible, and with decreased immune function, apathy, short attention span, and irritability (1, 6). Feeding of low-iron infant formula can compromise an infant's iron stores and lead to iron deficiency anemia. Cow's milk has insufficient and inappropriate amounts of nutrients and can cause occult blood loss that can lead to iron deficiency, stress on the kidneys from a high renal solute load, and allergic reactions (1, 4, 6-9). Sweetened condensed milk has an abundance of sugar that displaces other nutrients or causes over-consumption of calories (10). Homemade formulas prepared with canned evaporated milk do not contain optimal kinds and amounts of nutrients infants need (1, 6, 9, 10). Goat's milk, sheep's milk, imitation milks, and substitute milks do not contain nutrients in amounts appropriate for infants (1, 4, 6, 11, 12).

411.b Routinely using nursing bottles or cups improperly.

Dental caries is a major health problem in U.S. preschool children, especially in low-income populations (13). Eating and feeding habits that affect tooth decay and are started during infancy may continue into early childhood. Most implicated in this rampant disease process is prolonged use of baby bottles during the day or night, containing fermentable sugars, (e.g., fruit

juice, soda, and other sweetened drinks), pacifiers dipped in sweet agents such as sugar, honey or syrups, or other high frequency sugar exposures (14). The AAP and the American Academy of Pedodontics recommend that juice should be offered to infants in a cup, not a bottle, and that infants not be put to bed with a bottle in their mouth (15, 16). While sleeping with a bottle in his or her mouth, an infant's swallowing and salivary flow decreases, thus creating a pooling of liquid around the teeth (17). The practice of allowing infants to carry or drink from a bottle or training cup of juice for periods throughout the day leads to excessive exposure of the teeth to carbohydrate, which promotes the development of dental caries (15).

Allowing infants to sleep with a nursing bottle containing fermentable carbohydrates or to use it unsupervised during waking hours provides an almost constant supply of carbohydrates and sugars (1). This leads to rapid demineralization of tooth enamel and an increase in the risk of dental caries due to prolonged contact between cariogenic bacteria on the susceptible tooth surface and the sugars in the consumed liquid (1, 18). The sugars in the liquid pool around the infant's teeth and gums feed the bacteria there and decay is the result (19). The process may start before the teeth are even fully erupted. Upper incisors (upper front teeth) are particularly vulnerable; the lower incisors are generally protected by the tongue (19). The damage begins as white lesions and progresses to brown or black discoloration typical of caries (19). When early childhood caries is severe, the decayed crowns may break off and the permanent teeth developing below may be damaged (19). Undiagnosed dental caries and other oral pain may contribute to feeding problems and failure to thrive in young children (19).

Unrestricted use of a bottle containing fermentable carbohydrates is a risk because the more times a child consumes solid or liquid food, the higher the caries risk (1). Cariogenic snacks eaten between meals place the toddler most at risk for caries development; this includes the habit of continually sipping from cups (or bottles) containing cariogenic liquids (juice, milk, soda, or sweetened liquid) (19). If inappropriate use of the bottle persists, the child is at risk of toothaches, costly dental treatment, loss of primary teeth, and developmental lags on eating and chewing. If this continues beyond the usual weaning period, there is a risk of decay to permanent teeth.

Propping the bottle deprives infants of vital human contact and nurturing which makes them feel secure. It can cause: ear infections because of fluid entering the middle ear and not draining properly; choking from liquid flowing into the lungs; and tooth decay from prolonged exposure to carbohydrate-containing liquids (20).

Adding solid food to a nursing bottle results in force-feeding, inappropriately increases the energy and nutrient composition of the formula, deprives the infant of experiences important in the development of feeding behavior, and could cause an infant to choke (1, 11, 21, 22).

411.c Routinely offering complementary foods or other substances that are inappropriate in type or timing.

Infants, especially those living in poverty, are at high risk for developing early childhood caries (13). Most implicated in this disease process are: prolonged use of baby bottles containing fermentable sugars, (e.g., fruit juice, soda, and other sweetened drinks) during the day or night; pacifiers dipped in sweet agents such as sugar, honey or syrups; or other high frequency sugar exposures (14).

The AAP recommends exclusive breastfeeding through 6 months of age (1). Feeding solid foods too early (i.e., before 6 months of age) by, for example, adding diluted cereal or other solid foods to bottles deprives infants of the opportunity to learn to feed themselves (4, 11, 23). The major objection to the introduction of solids before 6 months of age is based on the possibility that it may interfere with establishing sound eating habits and may contribute to overfeeding (6,24). In early infancy, the infant possesses an extrusion reflex that enables him/her to swallow only liquid foods (1, 13, 25). The extrusion reflex is normally diminished by 6 months of age (1). Breast milk or iron-fortified infant formula is all the infant needs. Gastric secretions, digestive capacity, renal capacity and enzymatic secretions are low, which makes digestion of solids inefficient and potentially harmful (6, 24, 25). Furthermore, there is the potential for antigens to be developed against solid foods, due to the undigested proteins that may permeate the gut; however, the potential for developing allergic reactions may primarily be in infants with a strong family history of atopy (6, 24). If solid foods are introduced before the infant is developmentally ready, breast milk or iron-fortified formula necessary for optimum growth is displaced (1, 25). Around 6 months of age, the infant is developmentally ready for solid foods when: the infant is better able to express certain feeding cues such as turning head to indicate satiation; oral and gross motor skills begin to develop that help the infant to take solid foods; the extrusion reflex disappears; and the infant begins to sit upright and maintain balance with little or no support (1, 6, 24, 25).

The AAP advises against giving fruit juice to infants younger than 6 months since it offers no nutritional benefit at this age (1). Offering juice before solid foods are introduced into the diet could risk having juice replace breast milk or infant formula in the diet (15). This can result in reduced intake of protein, fat, vitamins, and minerals such as iron, calcium, and zinc (26). It is prudent to give juice only to infants who can drink from a cup (15).

411.d Routinely using feeding practices that disregard the developmental needs or stage of the infant.

Infants held to rigid feeding schedules are often underfed or overfed. Caregivers insensitive to signs of hunger and satiety, or who over manage feeding may inappropriately restrict or encourage excessive intake. Findings show that these practices may promote negative or unpleasant associations with eating that may continue into later life and may also contribute to obesity. Infrequent breastfeeding can result in lactation insufficiency and infant failure-to-thrive. Infants should be fed foods with a texture appropriate to their developmental level. (4, 6, 11, 13, 23)

411.e Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins.

Only pasteurized juice is safe for infants, children, and adolescents (15). Pasteurized fruit juices are free of microorganisms (15). Unpasteurized juice may contain pathogens, such as Escherichia coli, Salmonella, and Cryptosporidium organisms (15, 27). These organisms can cause serious disease, such as hemolytic-uremic syndrome, and should never be fed to infants and children (15). Unpasteurized juice must contain a warning on the label that the product may contain harmful bacteria (15, 28). Infants or young children should not eat raw or unpasteurized milk or cheeses (1)—unpasteurized dairy products could contain harmful bacteria, such as Brucella species, that could cause young children to contract a dangerous food borne illness. The AAP also recommends that young children should not eat soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese—these foods could contain Listeria bacteria (1) Hard cheeses, processed cheeses, cream cheese, cottage cheese, and yogurt need not be avoided (1).

Honey has been implicated as the primary food source of *Clostridium botulinum* during infancy. These spores are extremely resistant to heat, including pasteurization, and are not destroyed by present methods of processing honey. Botulism in infancy is caused by ingestion of the spores, which germinate into the toxin in the lumen of the bowel (10, 11, 29, 30).

Infants or young children should not eat raw or undercooked meat or poultry, raw fish or shellfish, including oysters, clams, mussels, and scallops —these foods may contain harmful bacteria or parasites that could cause children to contract a dangerous food borne illness (1).

According to the AAP, to prevent food-born illness, the foods listed below should not be fed to infants or young children. (1) All of the foods have been implicated in selected outbreaks of food-borne illness, including in children. Background information regarding foods that could be contaminated with harmful microorganisms is also included below (1):

- Raw vegetable sprouts (alfalfa, clover, bean, and radish)--Sprouts can cause potentially dangerous Salmonella and E. coli O157 infection. Sprouts grown under clean conditions in the home also present a risk because bacteria may be present in seed. Cook sprouts to significantly reduce the risk of illness (31).
- Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot) -- These foods have been found to be contaminated with *Listeria monocytogenes*; if adequately cooked, this bacteria is destroyed.

Please see section 411.9 below under “Human Milk”, for information related to the use of donor human milk acquired via the internet or directly from an individual.

411.f Routinely feeding inappropriately diluted formula.

Over-dilution can result in water intoxication resulting in hyponatremia; irritability; coma; inadequate nutrient intake; failure to thrive; poor growth (1, 4, 6, 11, 32). Under dilution of formula increases calories, protein, and solutes presented to the kidney for excretion, and can result in hypernatremia, tetany, and obesity (4, 6, 11, 32).

Dehydration and metabolic acidosis can occur (4, 6, 11, 32). Powdered formulas vary in density so manufacturer's scoops are formula specific to assure correct dilution (6). One clue for staff to identify incorrect formula preparation is to determine if the parent/caregiver is using the correct manufacturer's scoop to prepare the formula.

411.g Routinely limiting the frequency of nursing of the exclusively breastfed infant when breast milk is the sole source of nutrients.

Exclusive breastfeeding provides ideal nutrition to an infant and is sufficient to support optimal growth and development in the first 6 months of life (5). Human colostrum and milk have been studied extensively. They are composed of a mixture of nutritive components and other bioactive factors that are easy to digest and absorb and have strong physiologic effec25s upon the infant, and their composition changes over time to meet the infant's changing nutritional needs (1).

Frequent breastfeeding is critical to the establishment and maintenance of an adequate milk supply for the infant (5, 33-37). Inadequate frequency of breastfeeding may lead to lactation failure in the mother and dehydration, poor weight gain, diarrhea, vomiting, illness, and malnourishment in the infant (5, 35, 38-43). Exclusive breastfeeding protects infants from early exposure to contaminated foods and liquids (41). Infants who receive human milk more than infant formulas have a lower risk of being overweight in childhood and adolescence (44, 45). In addition, a summary report of several primary studies and meta- analyses has reported that a history of breastfeeding is associated with a reduction in the risk of otitis media, gastroenteritis, hospitalization for lower respiratory tract infections, atopic dermatitis, sudden infant death syndrome, childhood asthma, childhood leukemia, and type 1 and 2 diabetes (46).

411.h Routinely feeding a diet very low in calories and/or essential nutrients.

Highly restrictive diets prevent adequate intake of nutrients, interfere with growth and development, and may lead to other adverse physiological effects (4). Infants older than 6 months are potentially at the greatest risk for overt deficiency states related to inappropriate restrictions of the diet, although deficiencies of vitamins B12 and essential fatty acids may appear earlier (1, 47, 48). Infants are particularly vulnerable during the weaning period if fed a macrobiotic diet and may experience psychomotor delay in some instances (1, 49, 50). Well-balanced vegetarian diets with dairy products and eggs are generally associated with good health. However, strict vegan diets may be inadequate in calories, vitamin B12, vitamin D, calcium, iron, protein and essential amino acids needed for growth and development (51). The more limited the diet, the greater the health risk. Given the health and nutrition risks associated

with highly restrictive diets, WIC can help the parent to assure that the infant consumes an adequate diet to optimize health during critical periods of growth as well as for the long term.

411.i Routinely using inappropriate sanitation in preparation, handling, and storage of expressed human milk or formula.

Lack of sanitation in the preparation, handling and storage of expressed human milk or formula may cause gastrointestinal infection. The water used to prepare concentrated or powdered infant formula and prepare bottles and nipples (for formula and human milk) must be safe for consumption. Water contaminated with toxic substances (such as nitrates, lead, or pesticides) poses a hazard to an infant's health and should NOT be used (10). In addition, a heat source is necessary to sterilize bottles and other items used in the storage of both human milk and formula. Adequate refrigeration (40 Degrees Fahrenheit or below) is necessary to safely store human milk and prepared formula (10).

Human Milk

Published guidelines on the handling and storage of human milk may differ among pediatric nutrition authorities (1, 10, 52-55). However, there is consensus on the following human milk feeding, handling, and storage practices that are considered inappropriate and unsafe (10, 52, 56-58):

- Thawing frozen human milk in the microwave oven
- Refreezing human milk
- Adding freshly expressed unrefrigerated human milk to already frozen milk in a storage container
- Feeding previously frozen human milk thawed in the refrigerator that has been refrigerated for more than 24 hours
- Saving human milk from a used bottle for use at a subsequent feeding
- Failure to clean a breast pump per manufacturer's instruction
- Feeding donor human milk acquired directly from individuals or the internet.

Another consideration when recommending length of storage time is its effect on protective properties in human milk. There is evidence that after 48 hours of refrigeration, human milk significantly loses important antibacterial and antioxidant properties (59). These properties of human milk are specifically important for the prevention of necrotizing enterocolitis, retinopathy, and bronchopulmonary dysplasia of premature infants (5). Although some properties may be reduced with longer refrigerated storage, this does not diminish the overall superiority of human milk over formula, as formula does not contain these protective properties or many of the other benefits of human milk.

Participant circumstances (e.g., adequate refrigeration, safe water, heat source), the health of the infant and health care provider directions need to be considered when recommending the length of time human milk should be stored .

If the breastfeeding mother uses a breast pump, it is essential for her to fully understand the importance of the specific manufacturer's instructions for cleaning the breast pump. Improper cleaning of breast pumps and pump parts can increase the risk of expressed human milk contamination (58).

With increased awareness of the benefits and efforts to promote breastfeeding, more mothers are choosing to breastfeed, as evidenced by data from CDC in the Breastfeeding Report Card (61). But in situations such as illness, physical inability to produce human milk, decisions to not breastfeed, or adoptive parents seeking human milk, the desire to provide human milk may prompt parents/caregivers to turn to alternate methods of obtaining human milk to feed their infant. Since the cost of banked human milk can be prohibitive for WIC clients, these mothers may turn to informal milk sharing from known sources such as friends or relatives, or from unknown sources such as internet sites or other advertisements.

A study that evaluated human milk shared via the internet concluded that there was a high overall rate of bacterial growth and contamination, which suggests poor collection, storage, and shipping practices (62). In another study, researchers looked at current and past infection among potential donors to a human milk bank. It was revealed that a minimum of 3% of potential donors had positive serology for disease conditions such as syphilis, HIV, hepatitis B, hepatitis C, HTLV-1 or HTLV-2 (63). It was concluded that if these relatively low risk potential donors tested positive then the untested or unscreened women of donor human milk may present a significant health risk (63).

Although sharing human milk between those with an excess milk supply and those seeking milk for their infant may be growing in popularity (often facilitated by web sites established to link providers and recipients), both the AAP and the Food and Drug Administration (FDA) recommend against feeding infants human milk obtained directly from individuals or through the internet (59, 64). Obtaining donor human milk via these means is discouraged due to the lack of adequate screening for infectious diseases and the risk of contamination (59).

The FDA suggests that a decision to give donor human milk should be made in consultation with the infant's health care provider and only screened donor human milk should be used. Also, caregivers should consult with the infant's health care provider on where to obtain screened donor human milk (59). Due to the lack of Federal guidelines and standards pertaining to the operation, quality, and safety of human milk banks and potential liability concerns, the U.S. Department of Agriculture, Food and Nutrition Service does not authorize banked human milk as an allowable substitute for WIC-eligible formulas (see WIC Policy Memorandum 2000-2: *Use of Banked Human Breast Milk in the WIC Program*).

Formula

Formula must be properly prepared in a sanitary manner to be safe for consumption. Furthermore, prepared infant formula is a perishable food and must be handled and stored properly in order to be safe for consumption (4, 10).

Most babies who are hospitalized for vomiting and diarrhea are bottle fed. This has often been attributed to the improper handling of formula rather than sensitivities to the formula. In rare cases, the contaminated powdered formulas may cause infections in preterm or immune compromised infants. To reduce the risk of infection in infants it is important that formulas be carefully prepared and handled. All formula should be prepared according to the manufacturer's instruction on the label, or those given by the health care provider.

Manufacturers' instructions vary, depending on the product, in the length of time it is considered safe to store prepared infant formula without refrigeration before bacterial growth accelerates to an extent that the infant is placed at risk (1). Published guidelines on the handling and storage of infant formula indicate that it is unsafe to use prepared formula which (1):

- Has been held at room temperature longer than 1 hour or longer than recommended by the manufacturer
- Has been held in the refrigerator longer than the safe storage time indicated by the manufacturer
- Remains in a bottle one hour after the start of feeding
- Remains in a bottle from an earlier feeding
- Is fed using improperly cleaned baby bottles

411.j Feeding dietary supplements with potentially harmful consequences.

An infant consuming inappropriate or excessive amounts of single or multivitamin or mineral or herbal remedy not prescribed by a physician is at risk for a variety of adverse effects including harmful nutrient interactions, toxicity, and teratogenicity (1, 60). While some herbal teas may be safe, some have undesirable effects, particularly on infants who are fed herbal teas or who receive breast milk from mothers who have ingested herbal teas (61). Examples of teas with potentially harmful effects to children include: licorice, comfrey leaves, sassafras, senna, buckhorn bark, cinnamon, wormwood, woodruff, valerian, foxglove, pokeroot or pokeweed, periwinkle, nutmeg, catnip, hydrangea, juniper, Mormon tea, thorn apple, yohimbe bark, lobelia, oleander, Matế, kola nut or gotu cola, and chamomile 61-63). Like drugs, herbal or botanical preparations have chemical and biological activity, may have side effects, and may interact with certain medications--these interactions can cause problems and can even be dangerous (64). Botanical supplements are not necessarily safe because the safety of a botanical depends on many things, such as its chemical makeup, how it works in the body, how it is prepared, and the dose used (64).

411.k Routinely not providing dietary supplements recognized as essential by national public health policy when an infant's diet alone cannot meet. nutrient requirements.

Depending on an infant's specific needs and environmental circumstances, certain dietary supplements may be recommended by the infant's health care provider to ensure health. For example, fluoride supplements may be of benefit in reducing dental decay for children living in fluoride-deficient areas (1, 65).

Further, to prevent rickets and vitamin D deficiency in healthy infants and children, the AA P recommends a supplement of 400 IU per day for the following (5, 66):

1. All breastfed and partially breastfed infants unless they are weaned to at least 1 liter (or 1 quart) per day of vitamin D-fortified formula.
2. All nonbreastfed infants who are ingesting less than 1 liter (or 1 quart) per day of vitamin D- fortified formula.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Considerations for **Routinely using a substitute(s) for breast milk or for FDA approved iron- fortified formula as the primary nutrient source during the first year of life**:
    - Discuss risks of feeding infants a milk that does not provide ideal nutrition
    - Encourage participant to breastfeed or use a formula that will provide optimal nutrition for infants
- Considerations for **Routinely using nursing bottles or cups inappropriately**:
    - Discuss risks associated with improper use of bottles/cups
    - Discuss importance of good oral health
- Considerations for **Routinely offering complementary foods or other substances that are inappropriate in type or timing**:
    - Discuss infant feeding recommendations
- Considerations for **Routinely using feeding practices that disregard the developmental needs or stage of the infant**:
    - Discuss infant feeding recommendations
    - Encourage parents to follow infant's hunger and satiety cues
- Considerations for **Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins**:
    - Discuss foods that may be harmful to an infant due to an immature digestive tract
- Considerations for **Routinely feeding inappropriately diluted formula**:

  - Review correct formula dilution procedure
  - Discuss risks of not properly diluting formula
- Considerations for **Routinely limiting the frequency of nursing of the exclusively breastfed infant when breast milk is the sole source of nutrients**:
  - Review appropriate breastfeeding practices
  - Help mother identify infant's hunger and satiety cues
- Considerations for **Routinely feeding a diet very low in calories and/or essential nutrients**:
  - Review infants' nutrient needs
  - Help parent identify foods that provide adequate nutrients
- Considerations for **Routinely using inappropriate sanitation in preparation, handling, and storage of expressed breast milk or formula**:
  - Review food safety recommendations
- Considerations for **Feeding dietary supplements with potentially harmful consequences**:
  - Review infant feeding recommendations
  - Discuss risks of feeding infants supplements not prescribed by an MD
- Considerations for **Routinely not providing dietary supplements recognized as essential by national public health policy when an infant's diet alone cannot meet nutrient requirements**:
  - Review infants' nutrient needs
  - Discuss why certain dietary supplements (prescribed by an MD) could be beneficial

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425 Inappropriate Nutrition Practices for Children

Definition/Cut-Off Value

Routine use of feeding practices that may result in impaired nutrient status, disease, or health problems. These practices, with examples, are outlined below. (See 425: A-I)

Participant Category and Priority Level

Category	Priority	High Risk
Children	V	N

Parameter for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Inappropriate Nutrition Practices for Children	Examples of Inappropriate Nutrition Practices (including but not limited to)
425a Routinely feeding inappropriate beverages as the primary milk source.	Examples of inappropriate beverages as primary milk source: • Non-fat or reduced-fat milks (between 12 and 24 months of age unless the CPA determines overweight or obesity is a concern) or sweetened condensed milk; and • Imitation or substitute milks (such as inadequately or unfortified rice- or soy-based beverages, non-dairy creamer), or other “homemade concoctions.”
425b Routinely feeding a child any sugar-containing fluids.	Examples of sugar-containing fluids: • Soda/soft drinks; • Gelatin water; • Corn syrup solutions; and • Sweetened tea.
425c Routinely using nursing bottles, cups, or pacifiers improperly.	• Using a bottle to feed: ➢ Fruit juice, or ➢ Diluted cereal or other solid foods. • Allowing the child to fall asleep or be put to bed with a bottle at naps or bedtime. • Allowing the child to use the bottle without restriction (e.g., walking around with a bottle) or as a pacifier.

Inappropriate Nutrition Practices for Children	Examples of Inappropriate Nutrition Practices (including but not limited to)
	• Using a bottle for feeding or drinking beyond 14 months of age. • Using a pacifier dipped in sweet agents such as sugar, honey, or syrups. • Allowing a child to carry around and drink throughout the day from a covered or training cup.
425d Routinely using feeding practices that disregard the developmental needs or stages of the child.	• Inability to recognize, insensitivity to, or disregarding the child's cues for hunger and satiety (e.g., forcing a child to eat a certain type and/or amount of food or beverage or ignoring a hungry child's requests for appropriate foods). • Feeding foods of inappropriate consistency, size, or shape that put children at risk of choking. • Not supporting a child's need for growing independence with self-feeding (e.g., solely spoon-feeding a child who is able and ready to finger-feed and/or try self-feeding with appropriate utensils). • Feeding a child food with an inappropriate texture based on his/her developmental stage (e.g., feeding primarily pureed or liquid food when the child is ready and capable of eating mashed, chopped or appropriate finger foods).
425e Feeding foods to a child that could be contaminated with harmful microorganisms.	Examples of potentially harmful foods for a child: • Unpasteurized fruit or vegetable juice; • Unpasteurized dairy products or soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese; • Raw or undercooked meat, fish, poultry, or eggs; • Raw vegetable sprouts (alfalfa, clover, bean, and radish); • Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot).
425f Routinely feeding a diet very low in calories and/or essential nutrients.	Examples: • Vegan diet; • Macrobiotic diet; and • Other diets very low in calories and/or essential nutrients.
425g Feeding dietary supplements with potentially harmful consequences.	Examples of dietary supplements which when fed in excess of recommended dosage may be toxic or have harmful consequences: • Single or multi-vitamins; • Mineral supplements; and • Herbal or botanical supplements/remedies/teas.

Inappropriate Nutrition Practices for Children	Examples of Inappropriate Nutrition Practices (including but not limited to)
425h Routinely not providing dietary supplements recognized as essential by national public health policy when a child's diet alone cannot meet nutrient requirements.	• Providing children under 36 months of age less than 0.25 mg of fluoride daily when the water supply contains less than 0.3 ppm fluoride. • Providing children 36-60 months of age less than 0.50 mg of fluoride daily when the water supply contains less than 0.3 ppm fluoride. • Not providing 400 IU of vitamin D if a child consumes less than 1 liter (or 1 quart) of vitamin D fortified milk or formula.
425i Routine ingestion of non-food items (pica).	Examples of inappropriate nonfood items: • Ashes; • Carpet fibers; • Cigarettes or cigarette butts; • Clay; • Dust; • Foam rubber; • Paint chips; • Soil; and • Starch (laundry and cornstarch).

Justification

425.a Routinely feeding inappropriate beverages as the primary milk source.

Goat's milk, sheep's milk, imitation milks and substitute milks do not contain nutrients in amounts appropriate as a primary milk source for children (1-4). Non-fat and reduced-fat milks are not recommended for use with children from 1 to 2 years of age because of the lower calorie density compared with whole-fat products (1, 5). The low-calorie, low-fat content of these milks requires that increased volume be consumed to satisfy caloric needs. Infants and children under two using reduced fat milks gain at a slower growth rate, lose body fat as evidenced by skinfold thickness, lose energy reserves, and are at risk of inadequate intake of essential fatty acids. Additionally, essential fatty acids are a critical component of infant and child brain development with deficits early in life leading to significantly altered brain structure and function (6-8). Similar malnourishment has been associated with negative health outcomes including, but not limited to, slower language development, poorer motor function, lower IQ, poorer school performance, and eyesight problems (9).

WIC Regulations, however, include the option for WIC State agencies to issue reduced-fat milk and/or reduced-fat yogurt to children (1 to 2 years of age) for whom overweight or obesity is a concern, as determined by the Competent Professional Authority (CPA) (Food Package Guidance, May 2014). This option is consistent with the American Academy of Pediatrics (AAP) recommendation in the clinical report: *Lipid Screening and Cardiovascular Health in Childhood*. The AAP identifies parental history of obesity, lipidemia, and cardiovascular disease as determinants for a child for whom overweight or obesity is a concern. WIC State agencies that choose to authorize reduced-fat milk and/or reduced-fat yogurt for the 1 year old child must develop policy that defines the assessment criteria the CPA will use to determine if the child should be given reduced-fat dairy products.

425.b Routinely feeding a child any sugar-containing fluids.

Abundant epidemiologic evidence from groups who have consumed low quantities of sugar as well as from those who have consumed high quantities shows that sugar—especially sucrose—is the major dietary factor affecting dental caries prevalence and progression (6). Consumption of foods and beverages high in fermentable carbohydrates, such as sucrose, increases the risk of early childhood caries and tooth decay (6,7).

425.c Routinely using nursing bottles, cups, or pacifiers improperly.

Dental caries is a major health problem in U.S. preschool children, especially in low-income populations (8). Most implicated in this rampant disease process is prolonged use of baby bottles during the day or night, containing fermentable sugars, (e.g., fruit juice, soda, and other sweetened drinks), pacifiers dipped in sweet agents such as sugar, honey or syrups, or other high frequency sugar exposures (6). Solid foods such as cereal should not be put into a bottle for feeding; this is a form of force-feeding (9) and does not encourage the child to eat the cereal in a more developmentally-appropriate way. Additional justification for the examples include:

- The American Academy of Pediatrics (AAP) and the American Academy of Pedodontics recommend that children not be put to bed with a bottle in their mouth (10, 11). While sleeping with a bottle in his or her mouth, a child's swallowing and salivary flow decreases, thus creating a pooling of liquid around the teeth (12). Propping the bottle can cause: ear infections because of fluid entering the middle ear and not draining properly; choking from liquid flowing into the lungs; and tooth decay from prolonged exposure to carbohydrate-containing liquids (13).
- Pediatric dentists recommend that parents be encouraged to have infants drink from a cup as they approach their first birthday, and that infants are weaned from the bottle by 12-14 months of age (14).
- The practice of allowing children to carry or drink from a bottle or cup of juice for periods throughout the day leads to excessive exposure of the teeth to carbohydrate, which promotes the development of dental caries (10). Allowing toddlers to use a bottle or cup

containing fermentable carbohydrates unsupervised during waking hours provides an almost constant supply of carbohydrates and sugars (1). This leads to rapid demineralization of tooth enamel and an increase in the risk of dental caries due to prolonged contact between cariogenic bacteria on the susceptible tooth surface and the sugars in the consumed liquid (1, 14). The sugars in the liquid pool around the child's teeth and gums feed the bacteria there and decay is the result (15). The process may start before the teeth are even fully erupted. Upper incisors (upper front teeth) are particularly vulnerable; the lower incisors are generally protected by the tongue (15). The damage begins as white lesions and progresses to brown or black discoloration typical of caries (15). When early childhood caries are severe, the decayed crowns may break off and the permanent teeth developing below may be damaged (15). Undiagnosed dental caries and other oral pain may contribute to feeding problems and failure to thrive in young children (15). Use of a bottle or cup, containing fermentable carbohydrates, without restriction is a risk because the more times a child consumes solid or liquid food, the higher the caries risk (1). Cariogenic snacks eaten between meals place the toddler most at risk for caries development; this includes the habit of continually sipping from cups (or bottles) containing cariogenic liquids (juice, milk, soda, or sweetened liquid) (15). If inappropriate use of the bottle persists, the child is at risk of toothaches, costly dental treatment, loss of primary teeth, and developmental lags on eating and chewing. If this continues beyond the usual weaning period, there is a risk of decay to permanent teeth.

425.d Routinely using feeding practices that disregard the developmental needs or stages of the child.

The interactions and communication between a caregiver and child during feeding and eating influence a child's ability to progress in eating skills and consume a nutritionally adequate diet. These interactions comprise the "feeding relationship" (9). A dysfunctional feeding relationship, which could be characterized by a caregiver misinterpreting, ignoring, or overruling a young child's innate capability to regulate food intake based on hunger, appetite and satiety, can result in poor dietary intake and impaired growth (16, 17). Parents who consistently attempt to control their children's food intake may give children few opportunities to learn to control their own food intake (18). This could result in inadequate or excessive food intake, future problems with food regulation, and problems with growth and nutritional status. Instead of using approaches such as bribery, rigid control, struggles, or short-order cooking to manage eating, a healthier approach is for parents to provide nutritious, safe foods at regular meals and snacks, allowing children to decide how much, if any, they eat (1, 17). Young children should be able to eat in a matter-of-fact way sufficient quantities of the foods that are given to them, just as they take care of other daily needs (3). Research indicates that restricting access to foods (i.e., high fat foods) may enhance the interest of 3- to 5-year old children in those foods and increase their desire to obtain and consume those foods. Stringent parental controls on child eating has been found to potentiate children's preference for high-fat energy dense foods, limit children's acceptance of a variety of foods, and disrupt children's regulation of energy intake (19, 20). Forcing a child to clean his or her plate may lead to overeating or development of an aversion to certain foods (7). The toddler and preschooler are striving to be independent (7). Self-feeding is important even

though physically they may not be able to handle feeding utensils or have good eye-hand coordination (7). Children should be able to manage the feeding process independently and with dispatch, without either unnecessary dawdling or hurried eating (3, 12). Self-feeding milestones include (1): During infancy, older infants progress from semisolid foods to thicker and lumpier foods to soft pieces to finger-feeding table food (9). By 15 months, children can manage a cup, although not without some spilling. At 16 to 17 months of age, well-defined wrist rotation develops, permitting the transfer of feed from the bowl to the child's mouth with less spilling. The ability to lift the elbow as the spoon is raised and to flex the wrist as the spoon reaches the mouth follows. At 18 to 24 months, they learn to tilt a cup by manipulation with the fingers. Despite these new skills, 2-year-old children often prefer using their fingers to using the spoon. Preschool children learn to eat a wider variety of textures and kinds of food (3, 7). However, the foods offered should be modified so that the child can chew and swallow the food without difficulty (3).

425.e Feeding foods to a child that could be contaminated with harmful microorganisms.

According to the AAP, to prevent food-borne illness, the foods listed below should not be fed to young children or infants (1). All of the foods have been implicated in selected outbreaks of food-borne illness, including in children.

Background information regarding foods that could be contaminated with harmful microorganisms is also included below:

- Unpasteurized fruit or vegetable juice--Only pasteurized juice is safe for infants, children, and adolescents (10). Pasteurized fruit juices are free of microorganisms (10). Unpasteurized juice may contain pathogens, such as Escherichia coli, Salmonella, and Cryptosporidium organisms (10, 21). These organisms can cause serious disease, such as hemolytic-uremic syndrome, and should never be fed to infants and children (10). Unpasteurized juice must contain a warning on the label that the product may contain harmful bacteria (10, 22).
- Unpasteurized dairy products or soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese--Young children or infants should not eat raw or unpasteurized milk or cheeses (1)—unpasteurized dairy products could contain harmful bacteria, such as Brucella species, that could cause young children to contract a dangerous food borne illness. The American Academy of Pediatrics also recommends that young children should not eat soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese—these foods could contain Listeria bacteria (hard cheeses, processed cheeses, cream cheese, cottage cheese, and yogurt need not be avoided) (1).
- Raw or undercooked meat, fish, poultry, or eggs--Young children or infants should not eat raw or undercooked meat or poultry, raw fish or shellfish , including oysters, clams, mussels, and scallops (1) these foods may contain harmful bacteria or parasites that could cause children to contract a dangerous food-borne illness.
- Raw vegetable sprouts (alfalfa, clover, bean, and radish)--Sprouts can cause potentially dangerous Salmonella and E. coli O157 infection. Sprouts grown under clean conditions in

the home also present a risk because bacteria may be present in seed. Cook sprouts to significantly reduce the risk of illness (23).

- Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot)-These foods have been found to be contaminated with *Listeria monocytogenes*; if adequately cooked, this bacteria is destroyed.

425.f Routinely feeding a diet very low in calories and/or essential nutrients.

Highly restrictive diets prevent adequate intake of nutrients, interfere with growth and development, and may lead to other adverse physiological effects (24). Well-balanced vegetarian diets with dairy products and eggs are generally associated with good health. However, strict vegan diets may be inadequate in calories, vitamin B12, vitamin D, calcium, iron, protein and essential amino acids needed for growth and development (25). The more limited the diet, the greater the health risk. Given the health and nutrition risks associated with highly restrictive diets, WIC can help the parent to assure that the child consumes an adequate diet to optimize health during critical periods of growth as well as for the long term.

425.g Feeding dietary supplements with potentially harmful consequences.

A child consuming inappropriate or excessive amounts of single or multivitamin or mineral or herbal remedy not prescribed by a physician is at risk for a variety of adverse effects including harmful nutrient interactions, toxicity, and teratogenicity (1, 26). Like drugs, herbal or botanical preparations have chemical and biological activity, may have side effects, and may interact with certain medications--these interactions can cause problems and can even be dangerous (27). Botanical supplements are not necessarily safe because the safety of a botanical depends on many things, such as its chemical makeup, how it works in the body, how it is prepared, and the dose used (27). While some herbal teas may be safe, some have undesirable effects, particularly on young children who are fed herbal teas or who receive breast milk from mothers who have ingested herbal teas (28). Examples of teas with potentially harmful effects to children include: licorice, comfrey leaves, sassafras, senna, buckhorn bark, cinnamon, wormwood, woodruff, valerian, foxglove, pokeroot or pokeweed, periwinkle, nutmeg, catnip, hydrangea, juniper, Mormon tea, thorn apple, yohimbe bark, lobelia, oleander, Matế, kola nut or gotu cola, and chamomile (28-30).

425.h Routinely not providing dietary supplements recognized as essential by national public health policy when a child's diet alone cannot meet nutrient requirements.

Depending on a child's specific needs and environmental circumstances, certain dietary supplements may be recommended by the child's health care provider to ensure health. For example, fluoride supplements may be of benefit in reducing dental decay for children living in fluoride-deficient areas (1, 31). In addition, the AAP recommends that children who are ingesting less than 1 liter (1 quart) per day of vitamin D-fortified formula or milk, should receive a vitamin D supplement of 400 IU/day (32). Since 1 quart of milk is in excess of the recommended

2 cups of milk per day for pre-school children (33), most children will require a vitamin D supplement.

425.i Routine ingestion by child of nonfood items (Pica).

Pica is the compulsive eating of nonnutritive substances and can have serious medical implications (33). Pica is observed most commonly in areas of low socioeconomic status and is more common in women (especially pregnant women) and in children (30). Pica has also been seen in children with obsessive-compulsive disorders, mental retardation, sickle cell disease (34-36). Complications of this disorder include: iron-deficiency anemia, lead poisoning, intestinal obstruction, acute toxicity from soil contaminants, and helminthic infestations (34, 37, 38).

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Considerations for **Routinely feeding inappropriate beverages as the primary milk source**:
  - Review milk recommendations that are appropriate for the child's age and nutrition needs
- Considerations for **Routinely feeding a child any sugar-containing fluids:**
  - Discuss importance of good oral health
  - Encourage caregiver to help child maintain a healthy weight by giving water to drink most of the time
- Considerations for **Routinely using nursing bottles, cups, or pacifiers improperly**:
  - Discuss importance of good oral health
  - Review methods of weaning child from bottle or pacifier
- Considerations for **Routinely using feeding practices that disregard the developmental needs or stages of the child**:
  - Review feeding recommendations
  - Help caregiver understand importance of following child's hunger and satiety cues
- Considerations for **Feeding foods to a child that could be contaminated with harmful microorganisms**:
  - Review food safety recommendations
- Considerations for **Routinely feeding a diet very low in calories and/or essential nutrients**:
  - Review child's nutrient needs
  - Help parent identify foods that provide adequate nutrients
- Considerations for **Feeding dietary supplements with potentially harmful consequences**:
  - Review child feeding recommendations

    - Discuss risks of feeding children supplements not prescribed by an MD
- Considerations for **Routinely not providing dietary supplements recognized as essential by national public health policy when a child's diet alone cannot meet nutrient requirements**:
    - Review child's nutrient needs
    - Discuss why certain dietary supplements (prescribed by an MD) could be beneficial
- Considerations for **Routine ingestion by child of nonfood items (Pica)**:
    - Discuss risks of ingesting non-food items and help parent identify ways to keep child from eating the nonfood item(s)

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427 Inappropriate Nutrition Practices for Women

Definition/Cut-Off Value

Routine nutrition practices that may result in impaired nutrient status, disease, or health problems. These practices, with examples, are outlined below. Refer to "Justification and References" for this criterion. Participant Category and Priority Level

Category	Priority	High Risk
Pregnant Women	IV	N
Breastfeeding Women	IV	N
Not Breastfeeding woman	VI	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Inappropriate Nutrition Practices for Women	Examples of Inappropriate Nutrition Practices (including but not limited to)
427a Consuming dietary supplements with potentially harmful consequences.	Examples of dietary supplements which when ingested in excess of recommended dosages, may be toxic or have harmful consequences: • Single or multiple vitamins; • Mineral supplements; and • Herbal or botanical supplements/remedies/teas. • Cannabidiol (CBD) for Pregnant and Breastfeeding women only (Products labeled as CBD with any form of THC should be a risk with 372)
427b Consuming a diet very low in calories and/or essential nutrients; or impaired caloric intake or absorption of essential nutrients following bariatric surgery.	• • Low-calorie diet; • Strict vegan diet: and • Any other diet restricting calories and/or essential nutrients.

427c	Compulsively ingesting non-food items (pica).	• Dirt • Starch (laundry and cornstarch); • Large quantities of ice and/or freezer frost; • Cigarette ashes; • Baking soda; • Burnt matches; • Coffee grounds; • Chalk; • Uncooked rice; • Clay; or • Paper
427d	Inadequate vitamin/mineral supplementation recognized as essential by national public health policy.	• Consumption of less than 27 mg of iron as a supplement daily by pregnant woman. • Consumption of less than 150 mcg of supplemental iodine per day by pregnant and breastfeeding women. • Consumption of less than 400-800 mcg of folic acid from supplements daily by all WIC women categories.
427e	Pregnant woman ingesting foods that could be contaminated with pathogenic microorganisms.	Potentially harmful foods: • Seafood: Any raw or undercooked fish, or shellfish, or food containing raw or undercooked seafood, e.g., sashimi, found in some sushi or ceviche; Refrigerated smoked fish; Partially cooked seafood, such as shrimp and crab. • Raw or undercooked meat or poultry; • Hot dogs, luncheon meats (cold cuts), fermented and dry sausage and other deli-style meat or poultry products unless reheated until steaming hot; • Pâtés: Unpasteurized, refrigerated pâté or meat spreads; • Deli Salads prepared without preservatives in a deli-type store or restaurant; • Unpasteurized milk or foods containing unpasteurized milk; • Soft cheeses made with unpasteurized milk such as feta, Brie, Camembert, blue- veined cheeses and Mexican style cheeses such as queso blanco or queso fresco; • Eggs: Raw or undercooked eggs or foods containing raw or lightly cooked eggs including certain salad dressings (Caesar), cookie and cake batters, sauces, and beverages such as unpasteurized eggnog; • Raw sprouts (alfalfa, bean, clover, radish, microgreens); • Unpasteurized fruit or vegetable juices; or • Unwashed fruits and vegetables.

Justification

427.1 Consuming dietary supplements with potentially harmful consequences.

The use of herbal and dietary supplements for treating many different conditions is common during pregnancy (1, 2, 3). Pregnant and breastfeeding women taking inappropriate or excessive amounts of dietary supplements, such as single or multivitamins or minerals, herbal supplements, teas, or cannabidiol (CBD) are at risk for adverse effects such as harmful nutrient interactions, toxicity, and possible birth defects (2, 4). These substances can cross the placenta and may harm the fetus. They may also be present in breast milk and have a negative impact on the infant (1).

Most nutrient toxicities occur through excessive supplementation. Vitamins A, B-6 and the minerals iron and selenium can be micronutrients that are consumed in excess during pregnancy and breastfeeding (1). Vitamin A is critical during periods of rapid growth and cell development, however excessive amounts during pregnancy can cause birth defects (1). This is especially true if taken during the first 60 days of gestation (4). Supplementation of vitamin A is usually not necessary during pregnancy and is often limited to 770 mcg per day with a tolerable Upper Intake Level (UL) of 3,000 mcg per day (1, 5). The Recommended Dietary Allowance (RDA) for vitamin B6 for pregnant women is 1.9 mg per day in the U.S. (6). Doses of 50–510 mg per day taken during the first trimester have not been associated with adverse fetal outcomes, however the UL is set at 100 mg per day (4). Vitamin B6 is sometimes taken by pregnant women to reduce nausea and vomiting in doses of 10-25 mg three to four times a day. The effectiveness of this remains unproven but these amounts remain under the UL (1). The UL in the U.S. for iron is 45 mg per day and is based on the reported side effects of gastrointestinal discomfort, nausea, and constipation at levels of 40–50 mg per day. These are common complaints in pregnant women and iron supplementation may exacerbate discomfort (4). Selenium is another mineral that could potentially be consumed in excess during pregnancy. It acts as an antioxidant and is important in reproduction but there are no recommendations for supplementation during pregnancy (7). Excess selenium intake could be of concern if women eat locally from areas where the selenium content in the soil is high or consume large amounts of Brazil nuts (70-90 mcg/nut) or supplements (7). The RDA for selenium is 60 mcg per day for pregnant women and 70 mcg for breastfeeding women with an UL of 400 mcg per day for both (7). However, there are no known cases of selenium toxicity during pregnancy or breastfeeding in the U.S. (1). The following is a table showing the RDA and UL for Vitamins A, B6 and the minerals iron and selenium during pregnancy and lactation:

Micronutrients	Pregnancy RDA	Breastfeeding RDA	Tolerable Upper Intake Level
Vitamin A	770 mcg	1,300 mcg	3,000 mcg
B6	1.9 mg	2 mg	100 mg
Iron	27 mg	9 mg	45 mg
Selenium	60 mcg	70 mcg	400 mcg

Caution should be advised with the use of all herbal and dietary supplements during pregnancy and breastfeeding because safety, purity and effectiveness are not guaranteed because they are not regulated by the Food and Drug Administration (FDA) (1). Interactions with prescribed medications can also occur (1). The potency of herbal medicines can differ within and between batches of the same product and between products from different producers (3). Many people falsely believe that because herbs are natural that they are safe (1). Some herbs may be harmful during pregnancy because the rapidly growing fetus can be vulnerable to adverse effects due to rapid cell growth and division (2, 3). Herbs can also have different concentrations depending on what form they are used in. Teas (hot water extracts of dried herbs) contain the least number of compounds while tinctures are alcohol extracts of dried herbs and should be avoided in pregnancy because they have both the highest concentration of

compounds and the presence of alcohol (2). Raspberry and blackberry leaf teas can cause hypoglycemia in women with gestational diabetes (1, 2). Other herbs can cause uterine contractions and bleeding and are contraindicated in pregnancy including oregano tea, avocado leaf tea, cat's claw, sage tea, and large amounts of parsley or celery seeds (1). Regular chamomile consumption during third trimester has been found to be associated with a higher risk of pre-term delivery and lower birth weight (2). Ginger should be used in limited amounts during pregnancy because there are concerns over possible uterine stimulating effects (2). The recommended dose of ginger is 1,000 mg per day for nausea and vomiting of pregnancy (2). Fennel and peppermint tea used during pregnancy may be associated with adverse maternal and perinatal outcomes or toxicity from contaminants (2). Pregnant women should always discuss the use of herbal teas and supplements with their health care provider prior to use (1).

Pregnant and breastfeeding women should also speak with their health care provider before consuming products containing cannabidiol (CBD). The plant *Cannabis sativa* (cannabis), commonly known as marijuana, contains more than 100 chemical compounds that share a similar chemical structure, known as cannabinoids (8). The most common cannabinoid is the psychoactive compound tetrahydrocannabinol (THC) (9). The second most common cannabinoid in the plant is CBD which does not produce the typical known effects of marijuana (8, 9). All cannabinoids, including CBD, readily cross the placental barrier (8). CBD has been shown to help reduce inflammation, anxiety, pain, and seizures (8, 9). However, CBD products are not regulated by the Food and Drug Administration (FDA) and the FDA has approved only one CBD prescription drug to treat a rare form of epilepsy (10, 11). CBD is sold in a variety of forms including oral capsules, sublingual oils, topical creams, balms, and salves; e-liquids for vaporization; and dietary supplement forms (10). It is a molecule that dissolves easily in fats, which is why it is often in the form of an oil (9). CBD also is sold in a wide range of doses from 18-1500 mg (12). Studies of CBD products showed that only 31% were accurately labeled in regard to CBD levels and other studies have revealed the presence of potentially hazardous chemicals such as toxins or THC (10). Potential side effects of CBD use may include drug interactions, liver abnormalities, diarrhea, fatigue, vomiting, and sleepiness (11, 12).

The use of CBD has increased not only in the general population but also in pregnant women who may use it for pain, insomnia, anxiety, or nausea (9). Women report using CBD products during pregnancy to reduce severe pregnancy-related nausea (9). Though there are very few studies on the use of CBD during pregnancy, some have shown that CBD's potential negative effects may include placental changes, an effect on the functionality of the uterine lining, and inducing preterm labor (9). Animal studies are more plentiful and have shown that CBD use has caused harm to developing fetuses (11). More, larger studies are needed to determine if CBD use is safe during pregnancy in humans. Studies of CBD use during breastfeeding are also very limited. CBD has been found in breast milk after maternal marijuana use, whether by smoking or eating, but does not appear to be present after just CBD use (12). More research needs to be done to determine if CBD is found in breast milk after being consumed by the mother and its possible impact on the infant and on maternal milk supply (11, 13). There does remain a concern about CBD products containing unlabeled THC and other contaminates such as pesticides, heavy metals, bacteria, and fungus (11). Currently, the FDA strongly advises against the use of CBD in any form during pregnancy or while breastfeeding (11).

427.2 Consuming a diet very low in calories and/or essential nutrients; or impaired caloric intake or absorption of essential nutrients following bariatric surgery.

During pregnancy, the maternal diet must provide an adequate supply of energy to support the mother's usual requirements as well as those of the growing fetus. Extra energy is required for the synthesis of new and existing tissues in the second and third trimesters (5). Pregnant women who restrict their diets may increase the risk of birth defects, suboptimal fetal development, and chronic health problems in their children (5). Calorie restriction during pregnancy may lead to decreases in neonatal birthweight (5). The

pregnant adolescent who restricts her diet is of particular concern since her additional growth needs compete with the developing fetus and the physiological changes of pregnancy (1, 14).
A diet that severely restricts any macronutrient should be avoided during pregnancy. Examples include: the ketogenic diet which lacks carbohydrates, the Paleo diet which limits dairy, and any diet that consists of an excess of saturated fats. Fad diets may be especially harmful during pregnancy because of the resulting nutrient imbalance and consequent nutrient deficiencies or possible ketosis from lack of carbohydrates. Infants of mothers on a low-carbohydrate diet may be prone to gaining weight in childhood. An extreme intake of protein has been associated with low-birth-weight infants. The Paleo diet promotes consumption of excess saturated fats and restricts the consumption of dairy-based foods, which may contribute to deficiencies in calcium and vitamin D (14).

Vegan diets may also be highly restrictive and result in nutrient deficiencies (15). The percentage of people who eat a vegan diet has increased in the general population over the last years in part due to research supporting that plant-based diets are linked to improved health (1). However, strict veganism can have a low content of essential micronutrients such as iron, zinc, vitamin B 12, vitamin D, omega-3 fatty acids, calcium, and iodine (16). The most common nutrient deficiencies in vegans are vitamins D and B12 (15). Vitamin D supplements may be the best way to ensure adequate vitamin D levels as few plant foods are fortified with vitamin D (15, 16). Most studies show that vegan pregnant women are at a high risk of vitamin B12 depletion because they do not consume any animal products which are the natural sources of this vitamin (15). The breastmilk of a vegan mother can be severely deficient in vitamin B12 which if not treated could cause growth failure and permanent damage to the infant's nervous system (16). Breastfeeding women who follow a strict vegan diet should have their infant's vitamin B12 levels monitored (1). Pregnant and breastfeeding vegan women should be encouraged to take an individual B12 supplement that is dissolved on the tongue to increase absorption (1, 15). However, both pregnant and breastfeeding women following a vegan dietary pattern should consult with their healthcare provider to determine whether supplementation of vitamin D, vitamin B12 (and what form), and/or other nutrients such as iron, choline, zinc, iodine, or essential fatty acids are necessary (6).

Pregnant and breastfeeding women who have had weight loss surgeries are also at risk for nutrient deficiencies (1). Over half of bariatric surgeries are performed on women of reproductive age (17). Although pre-pregnancy weight loss from bariatric surgery may improve the chances of getting pregnant and decrease the risk of gestational diabetes and hypertension, it has the potential to make women susceptible to deficiencies in nutrients that are essential for healthy fetal development (1). The nutrients that need to be replaced depend on which bariatric surgery was performed and the nutritional status of the pregnant woman, but the most common deficiencies include vitamins D, folate, B12, B1, and A and the minerals iron and calcium (1, 17). Women who have had gastric band surgeries may have more difficulty eating enough while gastric bypass procedures tend to cause malabsorption problems (1). Common nutrient deficiencies following bariatric surgery can also be exacerbated by pregnancy symptoms such as morning sickness or hyperemesis, gastro-esophageal reflux, and abdominal bloating (1). The American College of Obstetricians and Gynecologists recommends delaying pregnancy for 18 months after bariatric surgery. A more individualized approach is to delay pregnancy until a woman's weight has been stable for 2 years (1). However, this does not always happen, and many women become pregnant with nutrient deficiencies. Pregnant women may also be unwilling to gain the recommended weight after losing weight post-surgery. Women who have had bariatric surgery have higher risks of fetal growth restriction, preterm births, higher rates of miscarriage and neonatal mortality after surgery (1). Malabsorptive procedures (bypass) are associated with a significant increase in Small for Gestational Age (SGA) whereas restrictive procedures (banding) are not (18). This increase in adverse perinatal outcomes could be related to malnutrition, since malabsorptive procedures bypass a portion of the small intestine where many vitamins and minerals are absorbed, making these patients particularly susceptible to nutrient deficiencies that may negatively affect pregnancy (18). Women of reproductive age undergoing bariatric surgery are a high-risk group and require specialized preconception and antenatal nutritional support to achieve the best outcomes for both mothers and

babies as bariatric surgeries increase (18). It is recommended that women who do become pregnant following bariatric procedures should have laboratory screening for nutritional deficiencies every trimester (17).

427.3 Compulsively ingesting non-food items (pica).

Pica refers to the persistent craving for, or eating of, non-food items usually dirt, raw starch, and ice (1). Other items may include paper, uncooked rice, baking soda, baby powder, burnt matches, cigarette ashes, or coffee grounds (1). Pica is common in pregnancy affecting 14-44% of women in the U.S. (1). The strength of the craving can be intense and has been compared to that for tobacco or alcohol (19). Pica is not limited to any race, culture, socio-economic group, or geographic area. It occurs in all areas of the world but is most common in Africa (19). Pregnant women in Ghana, where pica is common, indicated that most of them who consume non-food items do so to satisfy a craving or because they like the smell or taste (20). Some of the risk factors associated with pica include stress, cultural factors, low socioeconomic status, and an underlying mental illness (19). The cause of pica is not understood but some of the theories include that it relieves nausea and vomiting, or that it provides an essential nutrient that the woman is deficient in, most often iron or zinc (19). However, neither of these theories have been supported by research (21). It is more likely that malnutrition is the result of pica when nonfood items replace essential nutrients in the diet (1). Large intakes of non-food items can be harmful to a women's nutritional status. Substances like dirt may contain toxins like heavy metals (such as lead, cadmium, and arsenic), parasites, or other pathogens (19). Excessive consumption of dirt may also lead to intestinal obstructions or perforations (1). An emerging theory for the explanation of pica is that it serves useful immune functions by the ingested microorganisms stimulating the inborn immune system, resulting in less of a response to allergens and antigens (21). Eating dirt may be a means by which the gut diversifies its microorganism flora (21). However, pica during pregnancy can have negative consequences on the fetus (21). There have been case reports of intrauterine toxicity, lead poisoning that has caused long-term neurological disability and delayed childhood motor functions (21). Recommending stopping pica often fails since the craving is so strong but allowing the woman to smell the dirt and trading its consumption for a burned tortilla, toast or jicama may sometimes work (1).

427.4 Inadequate vitamin/mineral supplementation recognized as essential by national public health policy.

Nutrients of public health concern for women who are pregnant include iron, folate, choline, and iodine (6). Most healthcare providers recommend women who are pregnant or planning to become pregnant take a daily prenatal vitamin and mineral supplement in addition to consuming a healthy dietary pattern (1). This may be especially important to meet folic acid, iron, and iodine needs during pregnancy and iodine needs during breastfeeding (6).

The Recommended Dietary Allowance (RDA) for iron substantially increases during pregnancy from 18 mg per day to 27 mg per day (6). Iron is a key nutrient that supports fetal development (1). It is used by the body to make the extra blood that the pregnant woman and fetus need during pregnancy. This increased amount of iron is found in most prenatal vitamins (4, 22). Iron deficient anemia (IDA) is more common in economically and socially disadvantaged populations and this may independently contribute to complications in pregnancy and early childhood development (23). It is estimated that 33% of low-income pregnant women in the U.S. have IDA in their third trimester (1). IDA is associated with an increase in low birth weight, preterm delivery and increased fetal and neonatal mortality (1). The maternal effects of IDA include fatigue, light-headedness, and low prenatal weight gain (1). IDA in the first and second trimesters is associated with increased maternal morbidity (24). Iron needs for women who are breastfeeding differ from those who are pregnant. For adult women who are breastfeeding, before menstruation returns, iron needs fall to 9 mg/day and then return to pre-pregnancy levels once menstruation resumes (6). If breastfeeding women continue to take their prenatal vitamins, they may

exceed their needs for iron (1). Women who are breastfeeding should not exceed the UL of 45 mg of iron per day (4). Breastfeeding women should seek guidance from a healthcare provider regarding the appropriate level of iron supplementation based on their unique needs as more than half of breastfeeding women continue to use prenatal supplements (4).

Folic acid is the synthetic form of folate, a water-soluble B vitamin. Folate occurs naturally in foods such as dark green leafy vegetables, legumes, and oranges and is fortified in enriched grains (i.e., bread, pasta, rice, and cereal) (1). Most women do not receive the recommended daily allowance of folate from diet alone (25). Adequate folic acid intake is particularly important prior to conception and during the first trimester to help prevent neural tube defects (NTDs). NTDs are major birth defects of the brain and spine that occur early in pregnancy due to improper closure of the embryonic neural tube, which may lead to a range of disabilities or death (25). The most common NTDs are anencephaly (an underdeveloped brain and an incomplete skull) and spina bifida (incomplete closing of the spinal cord) (25). Other affects associated with low maternal folate levels include miscarriages, preterm births, orofacial clefts, and congenital heart defects (1). Natural folate is less bioavailable and has not been shown to lower the risk of NTDs as synthetic folic acid (1). The RDA for folate is higher during pregnancy and breastfeeding than all other life stages (6). The United States Preventative Services Task Force (USPSTF) recommends that all women who are planning or capable of pregnancy take a daily supplement containing 400 to 800 mcg of folic acid (25). The critical period for supplementation is at least 1 month before pregnancy and during the first 12 weeks of pregnancy (22). Most prenatal supplements sold in the United States contain folic acid (4). The recommendation for folic acid supplementation is in addition to the amounts of folate in food contained in a healthy eating pattern (6). Supplementation with folic acid during preconception and early pregnancy is critical and can prevent 40–80% of neural tube defects (4). The UL for women who are pregnant, or breastfeeding is 1,000 mcg of folic acid (6).

Iodine is an essential nutrient required for the synthesis of thyroid hormone, which is responsible for regulating growth, development, and metabolism (1). Iodine requirements increase substantially during pregnancy and breastfeeding (26). The RDA for iodine during pregnancy is 220 mcg and 290 mcg during breastfeeding (6). If iodine requirements are not met during these periods, the production of thyroid hormones may decrease and be inadequate for maternal, fetal, and infant needs (27). Inadequate iodine intake during pregnancy and breastfeeding could be detrimental to the growth and development of the baby's brain (6). Severe iodine deficiency during pregnancy and the neonatal period is associated with many adverse effects, including miscarriage, stillbirth, neonatal mortality, growth retardation and decreased IQ (28). Even subclinical hypothyroidism can double the risk of miscarriage and neonatal death (4). Adequate iodine levels in breastmilk are essential for the proper neurodevelopment of infants (1). The American Thyroid Association recommends that pregnant and breastfeeding women receive 150 mcg per day of supplemental iodine to meet the increased iodine needs during pregnancy and breastfeeding (1, 27). Many prenatal supplements do not contain iodine (1). Pregnant and breastfeeding women should discuss the need for supplemental iodine in their prenatal vitamin with their health care provider to ensure they are receiving an adequate amount (6).

The following is a table showing the RDA and UL for iron, folate and iodine during pregnancy and lactation:

Micronutrients	Pregnancy RDA	Breastfeeding RDA	Tolerable Upper Intake Level
Iron	27 mg	9 mg	45 mg
Folate	600 mcg	500 mcg	1,000 mcg
Iodine	220 mcg	290 mcg	1,100 mcg

427.5 Pregnant woman ingesting foods that could be contaminated with pathogenic microorganisms.

Foodborne illness is a serious public health problem. The CDC estimates that each year 1 in 6 people in the U.S. will get sick from a foodborne illness (1). The causes include pathogenic microorganisms (bacteria, viruses, and parasites) and their toxins and chemical contamination (1). Certain segments of the population are more susceptible to foodborne illnesses including pregnant women and their fetuses (29). During pregnancy a woman's immune system is weakened while the fetus's immune system is still developing, making it harder to fight off certain harmful foodborne microorganisms (29). Therefore, it is important that they avoid foods with a high risk of infection (29). For this reason, the Dietary Guidelines for Americans and government agencies such as the Centers for Disease Control and Prevention, the USDA Food Safety and Inspection Service, and the Food and Drug Administration advise pregnant women and other high-risk individuals not to consume unpasteurized (raw) juice or milk, raw sprouts, and some soft cheeses made from unpasteurized milk (6). During pregnancy, women should only eat foods containing seafood, meats, poultry, or eggs that have been cooked to recommended safe minimum internal temperatures (6).

Pregnant women are 10 times more likely to get *Listeria*, the bacteria that causes Listeriosis, than other U.S. adults (30). *Listeria* is a soilborne bacterium that grows in cool, moist environments (30). Infection occurs from eating contaminated foods including unpasteurized (raw) juice or milk, raw sprouts, or some soft cheeses made from unpasteurized milk (6). Deli and luncheon meats and hot dogs should be reheated to steaming hot or 165°F to kill *Listeria* (6). Listeriosis during pregnancy can cause miscarriage, stillbirth, or a preterm delivery. Infections are more likely in the third trimester (96%) than the first (3%), but the consequences are more severe with the earlier infections (1). *Salmonella*, *Campylobacter jejuni*, *E. coli,* and Toxoplasmosis is caused by a parasite (*Toxoplasma gondii)* that infects more than 40 million people in the U.S. (1). A woman can become infected with Toxoplasmosis by eating unpasteurized milk, raw vegetables, undercooked meat (especially pork, lamb, and venison), shellfish, and food contaminated with knives and cutting boards that have been in contact with raw meat or shellfish. Infection can also be caused by drinking contaminated water, after accidental ingestion of the parasite when in contact with cat feces (31). The risk of infection is higher during pregnancy and can lead to severe neurological damage, injury to various organs, miscarriage, premature birth, or stillbirth (1). Informing pregnant women and postpartum mothers about food safety issues through trained health professionals is crucial for the consistency of messages and increasing food safety awareness among vulnerable consumer groups (34).

Toxoplasmosis are other foodborne pathogens that are of concern for pregnant women (1). *Salmonella* is more likely to cause an infection in the mother rather than the fetus (31). *Salmonella* infections occur from eating contaminated foods such as raw or undercooked eggs, unpasteurized milk, raw or undercooked seafood or meat or unwashed fruits and vegetables (31). Symptoms include vomiting, diarrhea, abdominal pain, and flu-like aliments (31). *Campylobacter infections* are caused by consuming raw or undercooked poultry or another food that has been contaminated by raw or undercooked poultry (32). *Campylobacter* can cross the placenta and infect the fetus causing miscarriage, stillbirth, or preterm labor (32). *E. coli* can also affect pregnant women when they consume contaminated food or water, or unpasteurized milk (33). The symptoms can vary with each person but often include severe stomach cramps, diarrhea, vomiting, and sometimes a fever (33). If pregnant women are exposed to *E. coli*, dehydration is the main risk (1).

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- https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/
- Dietary Supplements | FDA

427.2 References – Highly Restrictive Eating/Nutrient Malabsorption

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428 Dietary Risk Associated with Complementary Feeding Practices

Definition/Cut-Off Value

An infant or child who has begun to or is expected to begin to 1) consume complementary foods and beverages, 2) eat independently, 3) be weaned from breast milk or infant formula, or 4) transition from a diet based on infant/toddler foods to one based on the *Dietary Guidelines for Americans*, is at risk of inappropriate complementary feeding.

A complete nutrition assessment, including for risk #411, Inappropriate Nutrition Practices for Infants, or #425, Inappropriate Nutrition Practices for Children, must be completed prior to assigning this risk.

Participant Category and Priority Level

Category	Priority	High Risk
Infants 4 to 12 months	IV	N
Children 12 to 23 months	V	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification

Overview

Complementary feeding is the gradual addition of foods and beverages to the diet of the infant and young child. (1, 2) The process of adding complementary foods should reflect the physical, intellectual, and behavioral stages as well as the nutrient needs of the infant or child. Inappropriate complementary feeding practices are common and well documented in the literature. Caregivers often do not recognize signs of developmental readiness and, therefore, offer foods and beverages that may be inappropriate in type, amount, consistency, or texture. Furthermore, a lack of nationally accepted feeding guidelines for children under the age of two might lead caregivers to assume that all foods are suitable for this age range.

The 2000 WIC Participant and Program Characteristics study (PC 2000) shows greater percentages of anthropometric and biochemical risk factors in children ages 6 to 24 months than in children 24 to 60 months of age. (3)

These differences could reflect physical manifestations of inappropriate complementary feeding practices. Although PC 2000 shows a lower dietary risk in the 6 to 24 month age group, this risk is probably under-reported due to the high incidence of other higher priority nutrition risks.

AGE	ANTHOPOMETRIC RISK (%)	BIOCHEMICAL RISK (%)	DIETARY RISK (%)
6-11M	40	16	55
1 YEAR	41	14	76
2 YEAR	37	12	80
3 YEAR	32	9	80
4 YEAR	35	7	79

The Institute of Medicine (IOM), in their report, *Summary of Proposed Criteria for Selecting the WIC Food Packages* identified specific nutrients with potential for inadequacy or excess for WIC participants. For breast-fed infants 6 through 11 months, the nutrients of concern for potential inadequacy are iron and zinc while those for children 12 through 23 months are iron, vitamin E, fiber and potassium. The nutrients of concern for excessive intake in children 12 through 23 months are zinc, preformed vitamin A, sodium and energy. (4)

To manage complementary feeding successfully, caregivers must make decisions about what, when, where, and how to offer foods according to the infant's or child's:

- Requirement for energy and nutrients;
- Fine, gross, and oral motor skills;
- Emerging independence and desire to learn to self-feed; and
- Need to learn healthy eating habits through exposure to a variety of nutritious foods. (1, 2, 5, 6, 7)

How WIC Can Help

The WIC Program plays a key role not only in the **prevention** of nutrition-related health problems, but also in the **promotion** of lifelong healthy eating behaviors. The process of introducing complementary foods provides a unique opportunity for WIC staff to assist caregivers in making appropriate feeding decisions for young children that may have lifelong implications.

Prevention of Nutrition-Related Health Problems

- Zinc deficiency: Zinc is critical for growth and immunity, as well as brain development and function. The concentration of zinc in breast milk declines to a level considered inadequate to meet the needs of infants 7 to 12 months of age. (8, 9) Complementary food sources of zinc, such as meats or zinc-fortified infant cereals, should be introduced to exclusively breastfed infants by 7 months.

- Iron deficiency: Hallberg states, "The weaning period in infants is especially critical because of the especially high iron requirements and the importance of adequate iron nutrition during this crucial period of development."(10) According to the Centers for Disease Control and Prevention (CDC), children less than 24 months of age, especially those between 9 and 18 months, have the highest rate of iron deficiency of any age group. (11) In the third National Health and Nutrition Examination Survey (NHANES III), children ages 1 to 2, along with adolescent girls, had the highest rates of overt anemia, while 9 % were iron deficient. (12) Meanwhile, the Pediatric Nutrition Surveillance 2003 Report noted anemia rates of 16.2 % in 6 to 11 month-old infants, 15.0 % in 12 to 17 month-olds, and 13.5 % in 18-23 month old children. (13)

  Picciano et al. reported that the intake of iron decreased from 98% of the recommended amount at 12 months to 76% at 18 months of age. (14) In WIC clinics, Kahn et al. found that the incidence of anemia was significantly more common in 6 to 23 month old children than in 23 to 59 month-olds. The 6 to 23 month-old was also more likely than the older child to develop anemia despite a normal hemoglobin test at WIC certification. (15)

Feeding practices that may prevent iron deficiency include:

- Breastfeeding infants exclusively until 4 to 6 months of age;
- Feeding only iron-fortified infant formula as a substitute for or supplement to breast milk until age 1;
- Offering a supplemental food source of iron to infants, between 4 to 6 months or when developmentally ready;
- Avoiding cow's milk until age 12 months; and
- Limiting milk consumption to no more than 24 ounces per day for children aged 1 to 5 years. (11)

- Obesity: Much of the literature on obesity indicates that learned behaviors and attitudes toward food consumption are major contributing factors. Proskitt states, "The main long term effect of weaning on nutritional status could be through attitudes toward food and meals learned by infants through the weaning process. This may be a truly critical area for the impact of feeding on later obesity." (16)

  Birch and Fisher state, "An enormous amount of learning about food and eating occurs during the transition from the exclusive milk diet of infancy to the omnivore's diet consumed by early childhood." The authors believe that parents have the greatest

influence on assuring eating behaviors that help to prevent future overweight and obesity. (17)

The American Academy of Pediatrics (AAP) states, "…prevention of overweight is critical, because long-term outcome data for successful treatment approaches are limited…" and, "Families should be educated and empowered through anticipatory guidance to recognize the impact they have on their children's development through lifelong habits of physical activity and nutritious eating." (1) Parents can be reminded that they are role models and teachers who help their children adopt healthful eating and lifestyle practices.

- Tooth decay: Children under the age of 2 are particularly susceptible to Early Childhood Caries (ECC), a serious public health problem. (18) In some communities, the incidence of ECC can range from 20% to 50%. (19) Children with ECC appear to be more susceptible to caries in permanent teeth at a later age. (1, 20) Dental caries can be caused by many factors, including prolonged use of a bottle and extensive use of sweet and sticky foods. (21)

  The Avon Longitudinal Study of Pregnancy and Childhood examined 1,026 children aged 18 months and found that baby bottles were used exclusively for drinking by 10 % of the children and for at least one feeding by 64% of the children. Lower income families were found to use the bottle more frequently for carbonated beverages than higher income families. (22)

  Complementary feeding practices that caregivers can use to prevent oral health problems include:

  - Avoiding concentrated sweet foods like lollipops, candy and sweetened cereals.
  - Avoiding sweetened beverages. Introducing fruit juice after 6 months of age (1) and only feeding it in a cup; and limiting fruit juice to 4-6 ounces/day.
  - Weaning from a bottle to a cup by 12 to 14 months. (23)

Promotion of Lifelong Healthy Eating Behaviors

- Timing of introduction of complementary foods:
  The AAP, Committee on Nutrition (CON) states that, "… complementary foods may be introduced between ages 4 and 6 months…" but cautions that actual timing of introduction of complementary foods for an individual infant may differ from this (population based) recommendation. Furthermore, the AAP-CON acknowledges a difference of opinion with the AAP, Section on Breastfeeding, which recommends exclusive breastfeeding for at least 6 months. (1)

  Early introduction of complementary foods before the infant is developmentally ready (i.e., before 4-6 months of age) is associated with increased respiratory illness, allergy in high-risk infants, and decreased breast milk production (7).

Infants with a strong family history of food allergy should be breastfed for as long as possible and should not receive complementary foods until 6 months of age. The introduction of the major food allergens such as eggs, milk, wheat, soy, peanuts, tree nuts, fish and shellfish should be delayed until well after the first year of life as guided by the health care provider. (7, 24)

Delayed introduction of complementary foods, on the other hand, is also associated with feeding difficulties. Northstone et al found that introduction of textured foods after 10 months of age resulted in more feeding difficulties later on, such as picky eating and/or refusal of many foods. To avoid these and other

developmental problems, solid foods should be introduced no later than 7 months, and finger foods between 7 and 9 months of age. (25)

- Choosing Appropriate Complementary Foods and Beverages:
  Complementary foods should supply essential nutrients and be developmentally appropriate. (7) The WIC Infant Feeding Practices Study (WIC-IFPS) found that by 6 months of age, greater than 80% of mothers introduced inappropriate dairy foods (i.e., yogurt, cheese, ice cream and pudding), 60% introduced sweets/snack foods (defined as chips, pretzels, candy, cookies, jam and honey), and 90% introduced high protein foods (beans, eggs and peanut butter) to their infants. This study also found that, among the infants who received supplemental drinks by 5 months of age, three-quarters had never used a cup, concluding that most infants received supplemental drinks from the bottle. By one year of age, almost 90% of WIC infants received sweetened beverages and over 90% received sweet/snack foods. (26)

  The Feeding Infants and Toddlers Study (FITS) found that WIC infants and toddlers consumed excess energy but inadequate amounts of fruits and vegetables. In addition, WIC toddlers consumed more sweets, desserts and sweetened beverages than non-WIC toddlers. (27)

  Sixty-five percent of all food-related choking deaths occur in children under the age of 2. Children in this age group have not fully developed their oral-motor skills for chewing and swallowing. For this reason, they should be fed foods of an appropriate consistency, size, and shape. Foods commonly implicated in choking include hot dogs, hard, gooey or sticky candy, nuts and seeds, chewing gum, grapes, raisins, popcorn, peanut butter and hard pieces of raw fruits and vegetables and chunks of meat or cheese. (1, 28, 29)

- Introducing a Cup: Teaching an infant to drink from a cup is part of the process of acquiring independent eating skills. A delay in the initiation of cup drinking prolongs the use of the nursing bottle that can lead to excess milk and juice intake and possible Early Childhood Caries (ECC). Weaning from a bottle to a cup should occur by 12 to14 months of age. (23)

- Helping The Child Establish Lifelong Healthy Eating Patterns:
  Lifelong eating practices may have their roots in the early years. Birch and Fisher state that food exposure and accessibility, the modeling behavior of parents and siblings, and the level of parental control over food consumption influence a child's food preferences. Inappropriate feeding practices may result in under- or over-feeding and may promote negative associations with eating that continue into later life.

  Normal eating behaviors such as spitting out or gagging on unfamiliar food or food with texture are often misinterpreted as dislikes or intolerances leading to a diminished variety of foods offered. Infants have an innate preference for sweet and salty tastes. Without guidance, an infant may develop a lifelong preference for highly sweetened or salty foods rather than for a varied diet. (17)

  A young child gradually moves from the limited infant/toddler diet to daily multiple servings from each of the basic food groups as described in the Dietary Guidelines. (30) The toddler stage (ages 1-2 years) may frustrate caregivers since many toddlers have constantly changing food preferences and erratic appetites. In addition, toddlers become skeptical about new foods and may need to experience a food 15-20 times before accepting it. (31)

  Caregivers can be guided and supported in managing common toddler feeding problems. Feeding practices that caregivers can use to facilitate a successful transition to a food group-based diet include:

  - Offering a variety of developmentally appropriate nutritious foods;
  - Reducing exposure to foods and beverages containing high levels of salt and sugar;
  - Preparing meals that are pleasing to the eye and include a variety of colors and textures; Setting a good example by eating a variety of foods;
  - Offering only whole milk from age 1-2; (Lower fat milk can be introduced after that age.)
  - Providing structure by scheduling regular meal and snack times;
  - Allowing the child to decide how much or whether to eat;
  - Allowing the child to develop eating/self-feeding skills; and
  - Eating with the child in a pleasant mealtime environment without coercion.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

None

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501 Possibility of Regression

Definition/Cut-Off Value

A participant who has previously been certified eligible for the Program may be considered to be at nutritional risk in the next certification period if the competent professional authority determines there is a possibility of regression in nutritional status without the benefits that the WIC Program provides. The State must limit the use of regression as a nutrition risk criterion to one time following a certification period.

Participant Category and Priority Level

Category	Priority	High Risk
Breastfeeding	VII	N
Not Breastfeeding	VII	N
Infants	VII	N
Children	VII	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

Justification
On occasion, a participant's nutritional status may be improved, to the point that s/he rises above the cutoff of the initial risk condition by the end of the certification period. This occurs most frequently with those conditions that contain specific cutoffs or thresholds, such as anemia or inappropriate growth.
Removal of such individuals from the Program can result in a "revolving-door" situation where the individual's recently improved nutritional status deteriorates quickly, so that s/he then re-enters the Program at equal or greater nutrition risk status than before. Therefore, WIC Program regulations permit State agencies to certify previously certified individuals who do not demonstrate a current nutrition risk condition based on the possibility of their reverting to the prior existing risk condition if they do not continue to receive WIC benefits. This provision may be used only once following a certification period. Such applicants shall not be considered to be at nutrition risk based on the possibility of regression for consecutive certification periods.

This policy is consistent with the preventive nature of the WIC Program, and enables State and local agencies to ensure that their previous efforts to

improve a participant's nutrition status, as well as to provide referrals to other health care, social service, and/or public assistance programs are not wasted.

Applicants who are certified based on the possibility of regression should be placed either in the same priority for which they were certified in the previous certification period; a priority level lower than the priority level assigned in the previous certification period, consistent with WIC regulations 246.7(e)(4); or in priority VII, if the State agency uses that priority level.

Competent Professional Authorities and other certifying staff should keep in mind that every nutrition risk condition does not necessarily lead itself to the possibility of regression. For example, gestational diabetes or gingivitis of pregnancy are not conditions to which a new mother could regress, since they are directly associated with pregnancy, and the breastfeeding or Not Breastfeeding woman cannot regress to being pregnant if she is no longer receiving WIC benefits.

Justification for High Risk
Not Applicable

Additional Counseling Guidelines

- Congratulate participant on improved nutritional status
- Give dietary recommendations appropriate to prevent reoccurrence of previous risk factor(s)
- Reinforce positive practices
- Inform participant of possibility of not requalifying for WIC at next certification

References

1. WIC Program Regulations: Section 246.7(e)(1)(iii)

502 Transfer of Certification

Definition/Cut-Off Value

Person with current valid Verification of Certification (VOC) document from another State or local agency. The VOC is valid through the end of the current certification period, even if the participant does not meet the receiving agency's nutritional risk, priority or income criteria, or the certification period extends beyond the receiving agency's certification period for that category, and shall be accepted as proof of eligibility for Program benefits. If the receiving agency is at maximum caseload, the transferring participant must be placed at the top of any waiting list and enrolled as soon as possible. (1, 2)

This criterion would be used primarily when the VOC card/document does not reflect another (more specific) nutrition risk condition or if the participant was certified based on a nutrition risk condition not in use by the receiving State agency (1).

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	NA	N
Breastfeeding	NA	N
Not Breastfeeding	NA	N
Infants	NA	N
Children	NA	N

Parameters for Auto Assign

Auto assigned if the current Application record is marked as Out-of-State VOC and this is the first certification for the current Application

Justification

Local agencies must accept Verification of Certification (VOC) documents from participants. A person with a valid VOC document shall not be denied participation in the receiving State because the person does not meet that State's particular eligibility criteria. Once a WIC participant has been certified by a local agency, the service delivery area into which s/he moves is obligated to honor that commitment. (1, 2).

Justification for High Risk

See specific risk factors

Additional Counseling Guidelines

See specific risk factors

References

1. U.S. Department of Agriculture, Food and Nutrition Service. Policy Memorandum 2016-4: Verification of Certification. August, 11, 2016. Available from: https://www.fns.usda.gov/wic/verification-certification.

2. WIC Program Regulations; 7 CFR 246.7(k).

601 Breastfeeding Mother of Infant at Nutritional Risk

Definition/Cut-Off Value

A breastfeeding woman whose breastfed infant has been determined to be at nutritional risk

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I, II, or IV*	N
Breastfeeding	I, II, or IV*	N

* Must be the same priority as at-risk infant.

Parameters for Auto Assignment

Auto assigned once risk records have been created for mother and infant

Justification

A breastfed infant is dependent on the mother's milk as the primary source of nutrition. Special attention should therefore be given to the health and nutritional status of the mother (3). Lactation requires an additional 500 kcal per day (approximately) as increased protein, calcium, and other vitamins and minerals (4, 5). Inadequate maternal nutrition may result in decreased nutrient content of the milk (5).

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Encourage and support continued breastfeeding
- Provide information on any breastfeeding concerns participant may have

References

1. Institute of Medicine. Nutrition During Lactation. National Academy Press, Washington, D.C.;1991.
2. Lawrence RA. Breastfeeding a guide for the medical profession. St. Louis: Mosby, 1994.
3. National Research Council (U.S.), Subcommittee on the Tenth Edition of the RDAs, National Institutes of Health, Committee on Dietary Allowances. Recommended dietary allowances. Washington, D.C.: National Academy Press, 1989.
4. WIC Program Regulations, Sect. 246.7(e)(1)(iii).
5. Worthington-Roberts BS, Williams SR. Nutrition in Pregnancy and Lactation. St. Louis: Mosby, 1993.

602 Breastfeeding Complications or Potential Complications (Women)

Definition/Cut-Off Value

A breastfeeding woman with any of the following complications or potential complications for breastfeeding:

602a Severe breast engorgement

602b Recurrent plugged ducts

602c Mastitis (fever or flu-like symptoms with localized breast tenderness)

602d Flat or inverted nipples

602e Cracked, bleeding or severely sore nipples

602f Age ≥ 40 years

602g Failure of milk to come in by 4 days postpartum

602h Tandem nursing (breastfeeding two siblings who are not twins)

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	Y (602f and 602h are **not** HR)

Parameters for Manual and Auto Assignment

Must be manually selected in the Nutrition Interview or Risk Panel.
(602f will auto assign if today's date minus DOB ≥ 40 years)

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned, except for 602f and 602h.

Justification

a) Severe engorgement is often caused by infrequent nursing and/or ineffective removal of milk. This severe breast congestion causes the nipple-areola area to become flattened and tense, making it difficult for the baby to latch-on correctly. The result can be sore, damaged nipples and poor milk transfer during feeding attempts. This ultimately results in diminished milk supply. When the infant is unable to latch-on or nurse effectively, alternative methods of milk expression are necessary, such as using an electric breast pump.
b) A clogged duct is a temporary back-up of milk that occurs when one or more of the lobes of the breast do not drain well. This usually results from incomplete emptying of milk. Counseling on feeding frequency or method or advising against wearing an overly tight bra or clothing can assist.
c) Mastitis is a breast infection that causes a flu-like illness accompanied by an inflamed, painful area of the breast – putting both the health of the mother and successful breastfeeding at risk. The woman should be referred to her health care provider for antibiotic therapy.
d) Infants may have difficulty latching-on correctly to nurse when nipples are flat or inverted. Appropriate interventions can improve nipple protractility and skilled help guiding a baby in proper breastfeeding technique can facilitate proper attachment.
e) Severe nipple pain, discomfort lasting throughout feedings, or pain persisting beyond one week postpartum is atypical and suggests the baby is not positioned correctly at the breast. Improper infant latch-on not only causes sore nipples, but impairs milk flow and leads to diminished milk supply and inadequate infant intake. There are several other causes of severe or persistent nipple pain, including Candida or staph infection. Referrals for lactation counseling and/or examination by the woman's health care provider are indicated.
f) Older women (over 40) are more likely to experience fertility problems and perinatal risk factors that could impact the initiation of breastfeeding. Because involutional breast changes can begin in the late 30's, older mothers may have fewer functioning milk glands resulting in greater difficulty producing an abundant milk supply.
g) Failure of milk to come in by 4 days postpartum may be a result of maternal illness or perinatal complications. This may place the infant at nutritional and/or medical risk, making temporary supplementation necessary until a normal breast milk supply is established.
h) With tandem nursing the older baby may compete for nursing privileges, and care must be taken to assure that the younger baby has first access to the milk supply. The mother who chooses to tandem nurse will have increased nutritional requirements to assure her adequate milk production.

Justification for High Risk

Breastfeeding provides optimal nutrition for infants during the first year of life. If complications arise in the breastfeeding process, the possibility that breastfeeding will continue diminishes greatly. The role of the Lactation Educator in the WIC program is to provide breastfeeding information to the WIC participant and triage any problems that arise with the breastfeeding

dyad. WIC has the ability to ensure breastfeeding success. It is important to refer these participants to a peer counselor for close follow-up. It may also be imperative to have the participant come back to the clinic for a follow-up visit sooner than the typical 3 month period. This will further ensure the participant receives the support and counsel needed to continue breastfeeding.

Additional Counseling Guidelines

- **Severe breast engorgement**:
  - Review hand expression procedures
  - Massage breast while nursing
  - Cold packs between feedings to reduce swelling
  - Warm shower or warm pack to promote milk ejection
  - Wear supportive bra
  - Loan electric breast pump for 24 hours or issue manual pump for relief
- **Recurrent plugged ducts**
  - Feed on affected side first
  - Massage breast in warm shower
  - Warm compress or gentle massage to area before feedings
  - Position baby's chin close to sore spot
  - Avoid tight fitting bras and clothing
- **Mastitis**
  - Nurse more frequently, at least every 2 hours
  - Feed on affected side first
  - Get plenty of bed rest
  - Increase fluid intake
  - Call MD for probable antibiotic prescription
  - Warm compresses before feedings
  - avoid tight fitting bras
- **Flat or inverted nipples**
  - use breast pump to pull out nipples prior to feedings
  - wear breast shells between feedings
    - start with short time periods, working up to 8 hours
    - do not wear at night
  - compress breast and areola between 2 fingers making it easier for infant to grasp
- **Cracked, bleeding or severely sore nipples**
  - involve the Lactation Educator as soon as possible for assessment
  - check positioning
  - short, frequent feedings – every 1-2 hours
  - begin nursing on the side which is least sore first
  - break baby's suction before removing from the breast
    - slip finger into corner of mouth, between gums
  - rub a small amount of breast milk or pure Lanolin on nipple after each feeding

  - air-dry breasts after each feeding
  - avoid using lotions, soaps, creams
  - avoid using breast pads with plastic liners, rubber nipples or pacifiers
- **Age ≥ 40 years:**
  - mom should be counseled on signs of adequate milk supply
  - 6-8 wet diapers
  - 4 or more bowel movements each day (before 2 months)
  - baby should be gaining weight
  - mother's milk should come in by 4 days postpartum
- **Failure of milk to come in by 4 days postpartum**
  - supplement until milk comes in
  - continue to put baby to breast
  - feed formula with infant dropper or cup to avoid nipple confusion
  - use breast pump to stimulate milk supply
- **Tandem nursing**
  - vary nursing patterns – younger infant needs to receive both fore and hindmilk
  - breastfeed younger infant every 1 ½ to 3 hours
  - give mother assurance that younger baby is receiving enough breast milk
    - 6-8 wet diapers
    - 4 or more bowel movements each day (before 2 months)
  - eat a balanced and nutritious diet including healthy snacks
  - drink to thirst

References

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3. Amier, L, Garland, SM, Dennerstein, L, et al.: Candida albicans: Is it associated with nipple pain in lactating women? Gynecol Obstetr Invest; 1996; 41:30-34.

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13. Woolridge, MW: Aetiology of sore nipples; Midwifery; 1986; 2:172-6.

References for High Risk

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2. Amir, LH., Cullinane, M., Garland, SM., Tabrizi, SN., Donath, SM., Bennett, CM., Cooklin, AR., Fisher, JRW and Payne, MS.; The Role of Micro-Orgnasims)Staphylococcus aureus and Candida albicans) in the Pathogenesis of Breast Pain and Infection in Lactating Women: Study Protocol; BMC Pregnancy and Childbirth; 2011; 11: 54; pp.1471-2393.

3. Wockel A, Beggel A, Rucke M, Abou-Dakn M, Arck P. Predictors of inflammatory breast diseases during lactation—results of a cohort study. *Am J Reprod Immunol*. 2010; 63: 28-37.

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603 Breastfeeding Complications or Potential Complications (Infants)

Definition/Cut-Off Value

A breastfed infant with any of the following complications or potential complications for breastfeeding:

603a Jaundice

603b Weak or ineffective suck

603c Difficulty latching onto mother's breast

603d Inadequate stooling (for age, as determined by a physician or other health care professional), and/or less than 6 wet diapers per day

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I	Y

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview or Risk Panel

High Risk Flag

The high risk designation will automatically activate when this risk factor is assigned

Justification

Jaundice occurs when bilirubin accumulates in the blood because red blood cells break down too quickly, the liver does not process bilirubin as efficiently as it should, or intestinal excretion of bilirubin is impaired. The slight degree of jaundice observed in many healthy newborns is considered physiologic. Jaundice is considered pathologic if it appears before 24 hours, lasts longer than a week or two, reaches an abnormally high level, or results from a medical problem such as rapid destruction of red blood cells, excessive bruising, liver disease, or other illness.

When jaundice occurs in an otherwise healthy breastfed infant, it is important to distinguish "breast milk jaundice" from "breastfeeding jaundice" and determine the appropriate treatment.

- In the condition known as "breast milk jaundice," the onset of jaundice usually begins well after the infant has left the hospital, 5 to 10 days after birth, and can persist for weeks and even months. Early visits to the WIC clinic can help identify and refer these infants to their primary health care provider. Breast milk jaundice is a normal physiologic phenomenon in the thriving breastfed baby and is due to a human milk factor that increases intestinal absorption of bilirubin. The stooling and voiding pattern is normal. If the bilirubin level approaches 18-20 mg%, the health care provider may choose to briefly interrupt breastfeeding for 24-36 hours which results in a dramatic decline in bilirubin level.

  Resumption of breastfeeding usually results in cessation of the rapid fall in serum bilirubin concentration, and in many cases a small increase may be observed, followed by the usual gradual decline to normal.

- "Breastfeeding jaundice", is an exaggeration of physiologic jaundice, which usually peaks between 3 and 5 days of life, though it can persist longer. This type of jaundice is a common marker for inadequate breastfeeding. An infant with breastfeeding jaundice is underfed and displays the following symptoms: infrequent or ineffective breastfeeding; failure to gain appropriate weight; infrequent stooling with delayed appearance of yellow stools (i.e., prolonged passage of meconium); and scant dark urine with urate crystals. Improved nutrition usually results in a rapid decline in serum bilirubin concentration.

A weak or ineffective suck may cause a baby to obtain inadequate milk with breastfeeding and result in a diminished milk supply and an underweight baby. Weak or ineffective suckling can be due to prematurity, low birth weight, a sleepy baby, or physical/medical problems such as heart disease, respiratory illness, or infection. Newborns who receive bottle feedings before beginning breastfeeding or who frequently use a pacifier may have trouble learning the proper tongue and jaw motions required for effective breastfeeding.

Difficulty latching onto the mother's breast may be due to flat or inverted nipples, breast engorgement, or incorrect positioning and breastfeeding technique. Early exposure to bottle feedings can predispose infants to "nipple confusion" or difficulty learning to attach to the breast correctly and effectively extract milk. A referral for lactation counseling should be made.

Inadequate stooling or less than 6 wet diapers are probable indicators that the breastfed infant is not receiving adequate milk. Not only is the baby at risk for failure to thrive, but the mother's milk is at risk for rapidly diminishing due to ineffective removal of milk. The breastfed infant with inadequate caloric intake must be identified early and the situation remedied promptly to avoid

long-term consequences of dehydration or nutritional deprivation. Although failure to thrive can have many etiologies, the most common cause in the breastfed infant is insufficient milk intake as a result of infrequent or ineffective nursing. Inadequate breastfeeding can be due to infant difficulties with latching on or sustaining suckling, use of a nipple shield over the mother's nipple, impaired let down of milk, a non-demanding infant, excessive use of a pacifier, or numerous other breastfeeding problems. The literature regarding inadequate stooling varies widely in terms of quantification; this condition is best diagnosed by the pediatrician or other health care practitioner.

Justification for High Risk

Breastfeeding provides optimal nutrition for infants during the first year of life. If complications arise in the breastfeeding process, the possibility that breastfeeding will continue diminishes greatly. The role of the Lactation Educator in the WIC program is to provide breastfeeding information to the WIC participant and triage any problems that arise with the breastfeeding dyad. WIC has the ability to ensure breastfeeding success. It is important to refer these participants to a peer counselor for close follow-up. It may also be imperative to have the participant come back to the clinic for a follow-up visit sooner than the typical 3 month period. This will further ensure the participant receives the support and counsel needed to continue breastfeeding.

Additional Counseling Guidelines

- **Breast milk jaundice**
  - Discontinue breastfeeding for 24-36 hours
  - Review pumping guidelines – may need to loan electric pump for 48 hours
- **Breastfeeding jaundice**
  - Avoid water supplements
  - Supplement with extra calories (formula) if necessary
- **Weak or ineffective suck**
  - Feed baby when awake and alert
  - Listen for suck-swallow pattern
  - Swallow after every two or three sucks
  - Suck-swallow pattern should last 5-10 minutes per breast
- **Difficulty latching on to mother's breast**
  - Review counseling for flat or inverted nipples or breast engorgement if appropriate
  - Mother may need to support breast using C-hold

References

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3. Neifert M: Early assessment of the breastfeeding infant; Contemporary Pediatr.; 1996; 13:142.

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References for High Risk

1. Wo, A., Beggel, A., Ru, M., Abou-Dakn, M. and Arck, P.; Predictors of Inflammatory Breast Diseases During; Am J Reprod Immunol; 2010; 63: pp. 28–37

2. Amir, LH., Cullinane, M., Garland, SM., Tabrizi, SN., Donath, SM., Bennett, CM., Cooklin, AR., Fisher, JRW and Payne, MS.; The Role of Micro-Orgnasims)Staphylococcus aureus and Candida albicans) in the Pathogenesis of Breast Pain and Infection in Lactating Women: Study Protocol; BMC Pregnancy and Childbirth; 2011; 11: 54; pp.1471-2393.

3. Mulder PJ. A concept analysis of effective breastfeeding. J Obstet Gynecol Neonatal Nurs. 2006; 35(3): 332-339.

701 Mom on WIC/Mom Not on WIC during Pregnancy

Definition/Cut-Off Value

An infant < six months of age whose mother was a WIC Program participant during pregnancy or whose mother's medical records document that the woman was at nutritional risk during pregnancy because of detrimental or abnormal nutritional conditions detectable by biochemical or anthropometric measurements or other documented nutritionally related medical conditions

If mother was not on during pregnancy but would have qualified, the CPA must document what the mother would have qualified for.

Participant Category and Priority Level

Category	Priority	High Risk
Infants	II	N

Parameters for Manual Assignment

Must be manually selected in the Nutrition Interview by selecting 701 checkbox or by answering "Yes" to the question: "Was mother on WIC during her pregnancy?"

May also be manually selected in the Risk Panel

Justification

Federal Regulations designate these conditions for WIC eligibility (1).

WIC participation during pregnancy is associated with improved pregnancy outcomes. An infant whose nutritional status has been adequately maintained through WIC services during gestation and early infancy may decline in nutritional status if without these services and return to a state of elevated risk for nutrition related health problems. Infants whose mother was at medical/nutritional risk during pregnancy, but did not receive those services, may also be thought of as a group at elevated risk for morbidity and mortality in the infant period (2, 3).

WIC participation in infancy is associated with lower infant mortality, decreased anemia for infants and improvements in growth (head circumference, height and weight). Infants on WIC

are more likely to consume iron-fortified formula and cereal and less likely to consume cow's milk before one year, thus lowering the risk of developing iron deficiency anemia (2, 3).

Justification for High Risk

Not Applicable

References

1. WIC Program Regulations: Section 246.7(e)(1)(ii).

2. Journal of the American Dietetic Association: Nutrition Services: A Literature Review; April 1989; Supplement vol. 89(4): s-13, s-19.

3. Ryan, A.S., Martinez, G.A. and Malec, D.J.: The Effect of the WIC Program on Nutrient Intakes of Infants; Medical Anthropology; 1984; vol. 9, no. 2.

702 Breastfeeding Infant of Woman at Nutritional Risk

Definition/Cut-Off Value

Breastfeeding infant of woman at nutritional risk

Participant Category and Priority Level

Category	Priority	High Risk
Infants	I – VII*	N

Note: Must be the same priority as at-risk mother.

Parameters for Auto Assignment

Auto assigned once risk records have been created for mother and infant

Justification

A breastfed infant is dependent on the mother's milk as the primary source of nutrition. Lactation requires the mother to consume an additional 500 kcal per day (approximately) as well as increased protein, calcium, and other vitamins and minerals (4, 5). Inadequate maternal nutrition may result in decreased nutrient content of the milk (5). Special attention should therefore be given to the health and nutritional status of breastfed infants whose mothers are at nutritional risk (3).

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Encourage and support continued breastfeeding
- Address any breastfeeding concerns she may have

References

1. WIC Program Regulations: Section 246.7(e)(1)(i)

2. WIC Program Regulations: Section 246.7(d)(1)(ii)

3. Worthington-Roberts, BS and Williams, SR: Nutrition in Pregnancy and Lactation; 4th Edition; Times-Mirror/Mosby College Publishing; 1989; pp. 364-365.

4. Food and Nutrition Board: Recommended Dietary Allowances; 10th revision; National Academy of Sciences; National Research Council; 1989; 34-35.

5. Institute of Medicine: Nutrition During Lactation; National Academy Press; 1991; pp. 103, 140, 214.

801 Homelessness

Definition/Cut-Off Value

A woman, infant or child who lacks a fixed and regular nighttime residence; or whose primary nighttime residence is:

- A supervised publicly or privately operated shelter designed to provide temporary living accommodations
  - This includes group shelters, rescue missions, shelters for victims of domestic violence, motels, etc.
- A public or private place not ordinarily used as a regular sleeping accommodation for human beings
  - Examples include tents, cars, parks, hallways, sidewalks, abandoned buildings, doorsteps, etc.
- A temporary residence for persons intended to be institutionalized

A homeless person may no longer be considered homeless while living in a temporary accommodation of another individual if it has been more than 365 days.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	IV	N
Breastfeeding	IV	N
Not Breastfeeding	VI	N
Infants	IV	N
Children	V	N

Parameters for Auto Assignment

Auto assigned if “homeless” is marked on the current Familiy Address record (Contact/Address screen)

Justification

Homeless individuals comprise a very vulnerable population with many special needs. WIC Program regulations specify homelessness as a predisposing nutrition risk condition. Today's homeless population contains a sizable number of women and children – over one-third of the total homeless population in the U.S. Studies show forty-three percent of today's homeless are

families, and an increasing number of the "new homeless" include economically-displaced individuals who have lost their jobs, exhausted their resources, and recently entered into the ranks of the homeless and consider their condition to be temporary.

Justification for High Risk

Not applicable

Additional Counseling Guidelines

- Review food preparation and safety techniques appropriate for current living conditions
    - Buy powdered or evaporated milk
    - Buy canned meats like tuna, chicken, turkey or ham
    - Buy canned soups with meat and beans for extra protein
    - Buy small amounts or fresh fruits and vegetables
    - Buy fruit juice in bottles or cans

References

1. WIC Program Regulations; Section 246.7(e)(2)(iv).

802 Migrancy

Definition/Cut-Off Value

Categorically eligible women, infants and children who are members of a family which contain at least one individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last 24 months, and who establishes a temporary residence for the purpose of such employment.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	IV	N
Breastfeeding	IV	N
Not Breastfeeding	VI	N
Infants	IV	N
Children	V	N

Parameters for Auto Assign

Auto assigned if “migrant” is marked on current Family Address record (Contact/Address screen)

Justification

Data on the health and/or nutritional status of migrants indicate significantly higher rates or incidence of infant mortality, malnutrition, and parasitic disease (among migrant children) than among the general U.S. population. Therefore, migrancy has long been stipulated as a condition that predisposes persons to inadequate nutritional patterns or nutritionally related medical conditions.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Review food preparation and safety techniques appropriate for current living conditions
    - buy powdered or evaporated milk
    - buy canned meats like tuna, chicken, turkey or ham

- buy canned soups with meat and beans for extra protein
- buy small amounts or fresh fruits and vegetables
- buy fruit juice in bottles or cans

References

1. WIC Program Regulations: Section 246.7(e)(2)(iv).

901 Recipient of Abuse

Definition/Cut-Off Value

Recipient of abuse is defined as an individual who has experienced physical, sexual, emotional, economic, or psychological maltreatment that may frighten, intimidate, terrorize, manipulate, hurt, humiliate, blame, injure, and/or wound the individual (1).

The experience of abuse may be self-reported by the individual, an individual's family member, or reported by a social worker, healthcare provider, or other appropriate personnel. Types of abuse relevant to the WIC population include, but are not limited to, the following:

• **Domestic violence**: abuse committed by a current or former family or household member or intimate partner (2, 3, 4).

• **Intimate partner violence** (IPV): a form of domestic violence committed by a current or former intimate partner (i.e., spouse, boyfriend/girlfriend, dating partner, or ongoing sexual partner) that may include physical violence, sexual violence, stalking, and/or psychological aggression (including coercive tactics) (5).

• **Child abuse and/or neglect**: any act or failure to act that results in harm to a child or puts a child at risk of harm. Child abuse may be physical (including shaken baby syndrome), sexual, or emotional abuse or neglect of an infant or child under the age of 18 by a parent, caretaker, or other person in a custodial role (such as a religious leader, coach, or teacher) (6, 7, 8).

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	IV or VII	N
Breastfeeding	IV or VII	N
Not Breastfeeding	VI or VII	N
Infants	IV or VII	N
Children	V or VII	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

Abuse is a serious public health problem with numerous individual and societal consequences. Women and children who experience abuse often suffer from immediate and long-term physical and emotional health consequences. It has been estimated that the per-victim lifetime cost (including medical costs, lost work productivity, criminal justice, and other costs) is $103,767 for women who experience IPV and $830,938 for children who experience maltreatment (4, 9). Although abuse is prevalent, it is often under-reported for a multitude of reasons. Many statistics related to IPV are reliant on self-report by the recipient. Women may be hesitant to report IPV or

seek help from health care providers due to reasons such as financial dependence on the abusive partner, fear of further abuse, fear of stigmatization, and shame (10, 11).

Additionally, screening and evaluation for abuse, particularly IPV, is often inconsistent in the medical community (11, 12).

Impact on Maternal Health

Data from the 2015 National Intimate Partner and Sexual Violence Survey (NISVS) indicate that about 1 in 3 women in the U.S. experienced contact sexual violence, physical violence, and/or stalking by an intimate partner in their lifetime (13). According to the National Center for Injury Prevention and Control, women in the U.S. experience about 4.8 million intimate partner-related physical assaults and rape each year (14). Between 2016 and 2018, the number of IPV incidents in the U.S. increased by 42% (15). The highest rates of IPV are generally experienced by women between the ages of 18 to 34 and nearly three quarters of all women recipients of IPV first experienced IPV before the age of 25 (13, 16). An estimated 11.6 million females between the ages of 11 and 17 years reported having experienced IPV (13). According to the NISVS, some ethnic minorities are disproportionately affected by IPV. The table below summarizes lifetime prevalence of IPV among women of various ethnicities (17):

Race/Ethnicity	Lifetime Prevalence of IPV
Multi-Racial, Non-Hispanic	57%
American Indian/Alaska Native, Non-Hispanic	48%
Black, Non-Hispanic	45%
White, Non-Hispanic	37%
Hispanic	34%
Asian or Pacific Islander	18%

Research suggests that the disclosure of IPV and seeking of services by certain racial/ethnic groups may be deterred due to a mistrust of the medical community, lack of cultural sensitivity, fear of stigmatization and inability to access services (10). Higher rates of IPV are experienced by immigrant women, especially among Latina and Asian women (18). Immigrant women are particularly susceptible to IPV due to poverty, social isolation, disparities in economic and social resources (between the woman and her partner), and immigration status (18). Other populations disproportionately affected by IPV include women with disabilities, LGBTQ women, women veterans, and women with substance use disorders (11). Research shows that:

• Women with disabilities have nearly double the lifetime risk of IPV (17).

• Women with physical health impairments and mental health impairments were 22% and 67% more likely to experience IPV than women without impairments, respectively (11).

• A greater proportion of gay/lesbian women (40%) and bisexual women (60%) report experiencing IPV compared to heterosexual women (35%) (11).

• The lifetime prevalence of IPV among transgender people ranges from 31-50% showing similar, if not higher rates of occurrence than other sexual minorities (11).
• The lifetime IPV prevalence for women veterans is 35% (11).
• Nearly 90% percent of women entering substance use treatment had experienced IPV in their lifetime (11).

While IPV during the perinatal period is more common than other maternal health conditions such as pre-eclampsia and placenta previa, it receives considerably less attention during perinatal care (19). Most studies have found that between 3- 9% of women experience abuse during pregnancy, with the rate increasing to as high as 12% after delivery (10). However, some studies conducted more specifically on low-income single women have estimated abuse rates up to 50% during pregnancy (12). Women living in low-socioeconomic conditions experience higher rates of IPV before and during pregnancy (10). Many of these women, who are at higher risk for adverse health outcomes, utilize WIC services (10). One study found that women who participate in WIC have higher odds of IPV during preconception and pregnancy compared to women who do not (10).

Women who experience abuse are at greater risk of a host of adverse physical health conditions including chronic pain (e.g., fibromyalgia, joint disorders, facial and back pain); cardiovascular problems (e.g., hypertension); gastrointestinal disorders (e.g., stomach ulcers, appetite loss, abdominal pain, digestive problems); and neurological problems (e.g., severe headaches, vision and hearing problems, memory loss, traumatic brain injury) (18). Moreover, women, who experience psychosocial stressors such as IPV, are more likely to partake in risky health behaviors (e.g., smoking, alcohol, and substance use) (16). Engaging in such behaviors puts women at an increased risk for unintended pregnancies and sexually transmitted infections (12).
Pregnant women who experience IPV are less likely to obtain adequate prenatal care and are twice as likely to miss prenatal appointments and not initiate care until the third trimester (12). One study found that women who experience abuse during pregnancy are less likely to gain the amount of weight recommended by the Institute of Medicine (IOM); specifically, excessive weight gain was associated with women aged 20 to 34, and inadequate weight gain was associated with women aged 35 years and older (20). Another study found that the pre-pregnancy BMI of women who experienced IPV before and/or during pregnancy was also more likely to be underweight or overweight compared to participants who were not abused (21). For more information about gestational weight gain, see risk #131 Low Maternal Weight Gain and risk #133 High Maternal Weight Gain.

Women who experience abuse during pregnancy may also suffer mental health consequences. Research has shown that IPV during pregnancy is associated with depression during the perinatal period. In fact, almost 40% of abused women report depressive symptoms, making it the most common mental health consequence of IPV. Women experiencing abuse while pregnant are 2.5 times more likely to report symptoms of depression than their non-abused counterparts. Post-traumatic stress disorder (PTSD) is also common among abused women, with rates ranging from 19-84%. (12) For more information about maternal mental health, see risk #361 Mental Illnesses.

Despite the detrimental effects of IPV, it is often under-reported and not commonly evaluated during pregnancy (21). In fact, research suggests that women are not routinely evaluated, and most clinicians only conduct screening when obvious warning signs are observed (10). According to a national survey, only 17% of providers routinely screen for IPV during the first visit and only 5% during follow-up visits (10). Researchers and caregivers agree that the ideal time to address IPV is during perinatal care because it is often the only time women have regular contact with health care providers; however, the consensus on how to approach IPV and which interventions should be adopted is unclear (19). The U.S. Department ofHealth and Human Services and American College of Obstetrics and Gynecologists recommend that physicians screen all women for IPV during obstetric care, beginning at the first prenatal visit, at least once per trimester, and at the postpartum checkup (10).

Impact on Infant Health

IPV experienced by the mother can have severe impacts on neonatal health, putting the infant at higher risk of low birth weight (LBW), preterm birth (PTB), or being born small for gestational age (SGA). IPV has also been shown to contribute to increased likelihood of spontaneous abortion, fetal loss, and neonatal death. These complications may be caused by several mechanisms, including blunt physical trauma to the mother, negative maternal coping behaviors (e.g., smoking, drug use, or alcohol use), inadequate maternal nutrition, isolation, limited access to prenatal care, and elevated physical or psychological stress levels. (12)

Analysis of data from the Pregnancy Risk Assessment Monitoring System (PRAMS) shows a small but significant relationship between IPV either before or during pregnancy and LBW infants (22). One study found that women seen in the hospital for assault while pregnant and who delivered their infants during that hospitalization were more than three times as likely to have a LBW infant (22). The cessation of domestic violence also appears to have a positive impact on infant weight gain. One study indicated that newborns of women who reported an end to domestic violence had greater increases in weight from 6-12 months of age compared to infants of mothers who reported continued violence (23). For more information about LBW, refer to risk #141 Low Birth Weight and Very Low Birth Weight.
While the research on the association between IPV during pregnancy and delivery of a SGA baby is limited, one meta-analysis found that SGA outcomes were significantly increased among women who experience IPV during pregnancy compared to women who did not (24). Another study conducted in a low-income, urban, and predominantly African American sample found that infants born to mothers experiencing IPV were five times more likely to suffer an adverse neonatal outcome (e.g., SGA, LBW or PTB) (12). Research shows that babies who are SGA are at an increased risk of early childhood developmental and behavioral problems and of developing coronary heart disease, stroke, non-insulin-dependent diabetes mellitus, adiposity, and metabolic syndrome in adulthood (12). For more information about SGA, refer to risk #151 Small for Gestational Age.

Shaken Baby Syndrome (SBS) or Abusive Head Trauma (AHT) is the leading cause of physical child abuse death in the United States (25). According to the Center for Disease Control and Prevention (CDC), SBS is a preventable, severe form of physical child abuse resulting from violently shaking an infant by the shoulders, arms, or legs (26). Approximately 1,300 reported cases of SBS/AHT occur in the U.S. each year and most involve babies less than 6 months old (25). Babies from birth to 1 year, especially babies ages 2 to 4 months, are at greatest risk of injury from shaking because they cry more frequently and are easier to shake than older children (26). Factors that increase the likelihood of SBS are having unrealistic expectations about child development and child-rearing, having been abused or neglected as a child, being a victim or witness to domestic violence, and being a single parent (26).

Breastfeeding

When it comes to infant feeding decisions, the research on the relationship between breastfeeding and IPV against the mother before, during and after pregnancy is limited and findings are mixed. A review of 16 studies concluded that IPV exposure appears to associate negatively with breastfeeding outcomes, including decreased breastfeeding initiation, early cessation of exclusive breastfeeding, and shortened duration of exclusive breastfeeding (27). However, high-quality research remains limited. Because exposure to IPV is not a strong

predictor of breastfeeding outcomes based on existing literature, WIC staff should provide breastfeeding support to help participants meet their individual breastfeeding goals.

Impact on Child Health

There are many forms of abuse and neglect. Per the CDC, the most common forms of child abuse and neglect are (28):

• **Physical abuse** – the intentional use of physical force that can result in physical injury. Examples include hitting, kicking, shaking, burning, or other shows of force against a child.

• **Sexual abuse** – involves pressuring or forcing a child to engage in sexual acts. It includes behaviors such as fondling, penetration, and exposing a child to other sexual activities.

• **Emotional abuse** – refers to behaviors that harm a child's self-worth or emotional well-being. Examples include name calling, shaming, rejection, withholding love, and threatening.

• **Neglect** – the failure to meet a child's basic physical and emotional needs. These needs include housing, food, clothing, education, and access to medical care.

According to data from National Survey of Children's Exposure to Violence, approximately 1 in 7 children (0 – 17 years old) in the U.S. experienced child abuse and/or neglect in the reported year (29). Children in families with low socioeconomic status experience child abuse and neglect at a rate that is five times higher than children in families with high socioeconomic status (28). The CDC estimated the total U.S. population economic burden associated with child maltreatment was approximately $428 billion in 2015, rivaling the burden of other public health concerns such as stroke and type 2 diabetes (28). According to the National Child Abuse and Neglect Data System, 75% of the 3.4 million child and abuse neglect referrals in 2011 were classified as neglect, with the majority of children being under 3 years old (30). Neglect can affect children throughout their lifetime depending on the timing, how often it occurs and the severity (30). Children who are abused often have moderate to severe malnutrition due to having food withheld, which may lead to a compromised nutrition state and failure to thrive (FTT) (31). While neglect is often associated with children being underweight, the research is mixed (30). There is a small body of evidence regarding neglect and obesity, with some studies showing neglect being associated with a higher risk of obesity (30). Research has also shown that even when they are not the recipient of abuse, children who witness acts of aggression or IPV in the home can suffer symptoms of post-traumatic stress disorder, such as bed-wetting or nightmares, and were at greater risk than their peers of having allergies, asthma, gastrointestinal problems, headaches, and the flu (14).

Serious neglect and physical, emotional, or sexual abuse have short- and long-term physical, emotional, and functional consequences for children. Children who are abused and/or neglected may suffer physical injuries such as cuts, bruises, or broken bones, as well as emotional and psychological problems, such as impaired social-emotional skills or anxiety. (28)

Child abuse and neglect are considered adverse childhood experiences (ACEs), which are potentially traumatic events that occur in childhood (0-17 years) such as experiencing violence, abuse, or neglect; witnessing violence in the home; and having a family member attempt or die by suicide. ACEs can have negative, lifelong effects on health, including disruption to healthy brain development, affecting social development, and compromising the immune system. Research shows that exposures to ACEs increases the risks of injury, sexually transmitted infections, including HIV, mental health problems, maternal and child health problems, teen

pregnancy, involvement in sex trafficking, and a wide range of chronic diseases such as cancer, type 2 diabetes, heart disease, and suicide. Child abuse and neglect are just a portion of potential ACEs that can occur in childhood. (32)

Implications for WIC Nutrition Services

WIC staff can provide the following nutrition services to participants who experience abuse:

- Provide a safe and supportive environment for participants who may be experiencing or have experienced abuse.
- Encourage pregnant women to attend all prenatal appointments with their health care provider and explain the importance of early and adequate prenatal care.
- Offer tailored breastfeeding support catered to the participant's specific needs and concerns.
- Encourage parents to attend local parenting classes or parent training programs (33).
- Refer the participant to their family case manager, if available, and/or to services and resources in their community that provide support to victims of abuse.
- Refer participants to national resources such as:
    - National Domestic Violence Hotline: 1-800-799-SAFE (7233). This hotline is staffed with trained counselors 24 hours a day and provides callers with crisis counselors, safety planning and assistance in finding resources, such as shelter. A secure, confidential online chat option is also available.
    - Directory of Crime Victim Services. This website provides a directory of programs and organizations that can help victims of crime.
    - Rape, Abuse and Incest National Network (RAINN): 1-800-656-HOPE (4673). This national hotline provides counseling and assistance to victims of sexual violence and their families and friends from trained counselors who are available 24 hours a day.
    - National Clearinghouse for the Defense of Battered Women (NCDBW): 1-800-903-0111 ext. 3. This national organization provides technical assistance to abused women facing charges related to their abuse.
    - Childhelp National Child Abuse Hotline: 1-800-4-A-CHILD (1-800-422-4453). This hotline offers information to parents seeking help for child abuse, individuals who suspect child abuse is occurring and those needing prevention tips. Professional counselors are available to provide support and referrals to emergency and social services. Their website also lists Child Protective Services in each state.

If State law requires the reporting of known or suspected child abuse or neglect, WIC staff must release such information to appropriate State officials. WIC regulations pertaining to confidentiality do not take precedence over such State law.

Justification for High Risk

Not Applicable

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902 Woman or Infant/Child of Primary Caregiver with Limited Ability to Make Feeding Decisions

Definition/Cut-Off Value

A woman or an infant/child whose primary caregiver is assessed to have a limited ability to make appropriate feeding decisions and/or prepare food. Examples include, but are not limited to, a woman or an infant/child of caregiver with the following:

- Documentation or self-report of misuse of alcohol, use of illegal substances, use of marijuana, or misuse of prescription medications.
- Mental illness, including clinical depression diagnosed, documented, or reported by a physician or psychologist or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver.
- Intellectual disability diagnosed, documented, or reported by a physician or psychologist or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver.
- Physical disability to a degree which impairs ability to feed infant/child or limits food preparation abilities.
- ≤ 17 years of age.

See Clarification for more information about self-reporting a diagnosis.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	IV	N
Breastfeeding	IV	N
Not Breastfeeding	VII	N
Infants	IV	N
Children	V	N

Parameters for Manual Assignment

Must be manually selected in Nutrition Interview or Risk Panel

Justification

A primary caregiver's ability to make appropriate feeding decisions and prepare suitable food is crucial for the health and nutrition of infants and young children. Infants and children depend entirely on caregivers for food, as well as to learn what, when, and how to eat. A

responsive feeding relationship, in which caregivers recognize infant/child cues and respond appropriately in a warm and nurturing environment, is critical for supporting healthy dietary habits, food preferences, and weight outcomes in children (1).
Several situations that might impair the feeding abilities of a caregiver have been identified below as potential nutritional risks for infants and children.

A pregnant or postpartum woman's ability to choose and prepare suitable foods for herself is vital for her own nutritional status and wellbeing. A variety of circumstances can impair a woman's ability to make diet- related decisions or prepare food and thus have been identified as possible nutritional risks for pregnant and postpartum women.

Substance Use

About 1 in 5 children in the US live with at least one caregiver who has a substance use disorder (2). While little research has been conducted on the impact of parental substance misuse on infant/child feeding, much has been learned about the influence of substance misuse on overall parenting and caregiving abilities. Parental substance misuse is *sometimes* associated with the following, which can all potentially have a negative impact on infant/child feeding:

- Impaired parental behaviors – "lower levels of parental involvement, limited or absent parental monitoring, ineffective control of children's behavior, and poor discipline skills" (2).
- Compromised caregiving relationship – Less sensitive and responsive to infant/child's cues and needs (3, 4); and less warm, positive, nurturing, and emotionally available (5).
- Reduced capacity to prioritize infant/child's needs (including feeding needs) over need for substances (2, 4).
- Parental difficulty in controlling emotions and anger (4).
- Reduced likelihood for infants/children to receive adequate medical and dental care (2).
- Chaotic, unpredictable home environment – higher rates of household financial instability, food and housing insecurity, inconsistent employment, domestic violence, and stress (2).
- Parental incarceration (2).
- Increased likelihood of infant/child entering foster care – about 60% of infants and 40% of children in out-of-home care are from families with substance use disorders (2, 4).
- Increased risk of neglect and abuse – children of parents who misuse substances are 3 times as likely to be physically, emotionally, or sexually abused and 4 times as likely to be emotionally or physically neglected (2).

In addition to impacting infants/children, substance use can also impair a woman's ability to choose and prepare suitable foods for herself. People with substance use disorders tend to have impaired decision- making (6, 7), which can extend to diet-related choices. Also, as stated above, substance use can result in difficulty in controlling emotions and anger; a

chaotic, unpredictable home environment; and incarceration – all of which can negatively impact ability to choose and prepare foods.

For additional information, please refer to Risk 372 – *Alcohol and Substance Use*.

Mental Illness

Mental illness refers to a wide range of mental health conditions-disorders that affect your mood, thinking and behavior. Examples of mental illness include depression, anxiety disorders, schizophrenia, eating disorders and addictive behaviors (8). Some caregivers with a mental illness can struggle with parenting, including the feeding of infants and young children (1, 9). Depression in particular has been studied for its impact on the caregiver-child feeding relationship. For mothers with depression, they may be less able to detect and respond to an infant's needs, including feeding needs. Depressed mothers are also more likely to be withdrawn, disengaged, and non-interacting, all of which can negatively impact infant/child feeding. Maternal depression may also have a significant impact on breastfeeding dyads, as depression is linked to worrying more about breastfeeding and reporting breastfeeding difficulties (10). In addition, mothers who are depressed tend to have decreased rates of breastfeeding initiation, duration, and exclusivity, compared to mothers who are not depressed (10). There is a scarcity of research on the impact of other forms of mental illness (other than depression) on the caregiver-infant/child feeding relationship. For additional information on depression, please refer to Risk 361 – *Depression.*

Mental illness can be debilitating to pregnant and postpartum women in a variety of ways, which include impairing the ability to choose and prepare suitable foods. Some studies indicate that poor eating habits may be common among those with a mental illness (11, 12). For example, people with bipolar disorder or schizophrenia are more likely to report only eating once a day, eating alone, and having difficulty with preparing food (11). Individuals with a mental illness also may experience cognitive challenges, which can limit learning and retention of information about nutrition and food preparation. In addition, those with a mental illness may also have limited resources (due to not being able to work) for purchasing foods.

Intellectual Disability

Intellectual disability is a disability characterized by significant limitations in both intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills (13). A limited amount of research has been conducted on the impact of caregiver intellectual disability and infant/child feeding.
Some research indicates caregivers with an intellectual disability may be less sensitive to an infant/child's cues (14). Other research indicates some caregivers with an intellectual disability also struggle with interacting positively and demonstrating affection with their infant/child (15). Based on each individual's

situation, these concerns could possibly impair a caregiver's ability to provide appropriate infant/child feeding.

Having an intellectual disability, such as Down syndrome, may make it difficult or even impossible for women to choose, prepare, or serve themselves foods and beverages (16). As a result, some women with intellectual disabilities are at risk for developing diseases associated with obesity, inactivity, and poor nutrition and may have very little choice in deciding their dietary intake since it may be determined by a caregiver (17).

Physical Disability

Some physical disabilities have the potential to reduce a caregiver's ability to feed an infant/child appropriately or prepare suitable foods. Likewise, some physical disabilities may limit a woman's ability to feed herself or prepare suitable foods for herself. This risk should be assigned if a caregiver's physical disability restricts or limits food preparation ability or ability to feed an infant/child. It should also be assigned if a woman's physical disability restricts or limits her ability to prepare foods for herself or to feed herself.

17 Years of Age and Younger

In 2015, about 230,000 infants were born to teenage mothers; this is a birthrate of about 22 per 1,000 teenage women (18). Teenage mothers may face several challenges as they raise infants and children, including their ability to interact in a responsive manner. Being a teenage mother is *sometimes* associated with the following, which can all potentially have a negative impact on infant/child feeding:

- Increased likelihood of a compromised caregiving relationship – Reduced verbal and emotional responsiveness to infant/child (19), reduced sensitivity to needs of infant (19), and impaired ability to provide cognitive stimulation to infant/child (20).
- Increased likelihood of infant/child entering foster care (20).
- Greater likelihood to misuse substances (21).

For additional information regarding pregnant and postpartum adolescents, please refer to Risk 331 –*Pregnancy at a Young Age*.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Assess need for assistance in shopping, cooking and preparing meals
- Give tips on grocery shopping

- If bottle feeding
    - Discuss bottle sanitation and preparation
    - Review formula mixing instructions
        - Issue concentrate or ready-to-feed, if appropriate

Implications for WIC Nutrition Services

WIC provides support to women and to infants/children of caregivers with limited ability to make appropriate feeding decisions/prepare food by offering counseling on nutrition, breastfeeding, and infant/child feeding. WIC also provides nutritious foods for women and caregivers to give their infants/children, as well as referrals to support participants' needs. WIC staff can assist participants by:

- Providing individualized nutrition education in an easy-to-understand format that is appropriate for the learning level of the participant/caregiver. Most education materials should be written for a 5^{th} to 7^{th} grade reading level. Be sensitive to the unique learning needs and style of the participant/caregiver, which may mean using food models, posters, and handouts (12).
- Providing referrals to promote parenting and infant/child feeding skills, including referrals to local home visiting programs, parenting programs, and early intervention services.
- Providing referrals to those with substance misuse for professional treatment, referring to community resources for alcohol and substance use support groups, and providing breastfeeding promotion and support to women enrolled in supervised medication-assisted treatment programs.
- Encouraging participants/caregivers with mental illnesses, intellectual disabilities, and physical disabilities to follow health care provider's plan of care. Coordinate with health care providers as needed.
- Providing individualized food packages, tailored to meet the needs of participants. Some caregivers who have a limited ability to make appropriate feeding decisions/prepare food may be unable to prepare powder or concentrated infant formula. Thus, for the safety of the infant, State WIC Agencies may allow ready-to-feed (RTF) WIC formulas to be issued when it is determined that the caregiver may have difficulty correctly diluting powder or concentrated formulas. Please refer to your State WIC Agency's specific policies regarding the issuance of RTF, as policies vary from state to state.

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis ("My doctor says that I have/my son or daughter has…") should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

903 Foster Care

Definition/Cut-Off Value

Entering the foster care system during the previous six months or moving from one foster care home to another foster care home during the previous six months.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	IV	N
Breastfeeding	IV	N
Not Breastfeeding	VI	N
Infants	IV	N
Children	V	N

Parameters for Auto Assignment

Auto assigned if Foster Care indicator is set to “Yes” and today’s date minus Entered Foster Care Date or Changed Foster Care Families Date is ≤ 6 months

Justification

"Foster children are among the most vulnerable individuals in the welfare system. As a group, they are sicker than homeless children and children living in the poorest sections of inner cities." This statement from a 1995 Government Accounting Office report on the health status of foster children confirms research findings that foster children have a high frequency of mental and physical problems, often the result of abuse and neglect suffered prior to entry into the foster care system. When compared to other Medicaid-eligible children, foster care children have higher rates of chronic conditions such as asthma, diabetes and seizure disorders. They are also more likely than children in the general population to have birth defects, inadequate nutrition and growth retardation including short stature.

Studies focusing on the health of foster children often point out the inadequacy of the foster care system in evaluating the health status and providing follow-up care for the children for whom the system is responsible. Because foster care children are wards of a system which lacks a comprehensive health component, the social and medical histories of foster children in transition, either entering the system or moving from one foster care home to another, are frequently unknown to the adults applying for WIC benefits for the children. For example, the adult accompanying a foster child to a WIC clinic for a first-time certification may have no knowledge of the child's eating patterns, special dietary needs, chronic illnesses or other factors

which would qualify the child for WIC. Without any anthropometric history, failure to grow, often a problem for foster children, may not be diagnosed even by a single low cutoff percentile. Since a high proportion of foster care children have suffered from neglect, abuse or abandonment and the health problems associated with these, entry into foster care or moving from one foster care home to another during the previous six months is a nutritional risk for certification in the WIC Program. CPAs using this risk should be diligent in evaluating and documenting the health and nutritional status of the foster child to identify other risks as well as problems that may require follow-up or referral to other health care programs. This nutritional risk cannot be used for consecutive certifications while the child remains in the same foster home. It should be used as the sole risk criterion only if careful assessment of the applicant's nutritional status indicates that no other risks based on anthropometric, medical or nutritional risk criteria can be identified.

The nutrition education, referrals and service coordination provided by WIC will support the foster parent in developing the skills and knowledge to ensure that the foster child receives appropriate nutrition and health care. Since a foster parent frequently has inadequate information about a new foster child's health needs, the WIC nutritionist can alert the foster parent to the nutritional risks that many foster care children have and suggest ways to improve the child's nutritional status.

Justification for High Risk

Not Applicable

Additional Counseling Guidelines

- Review nutrition risks that many foster care children have:
  - Anemia
  - Diabetes
  - Seizure disorders
  - Inadequate nutrition
  - Growth retardation including short stature
  - Failure to grow

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904 Environmental Tobacco Smoke Exposure (also known as passive, secondhand, or involuntary smoke)

Definition/Cut-Off Value

Environmental tobacco smoke (ETS) exposure is defined (for WIC eligibility

purposes) as exposure to smoke from tobacco products inside the home. *(1,2,3)

* See Clarification for background information.

Participant Category and Priority Level

Category	Priority	High Risk
Pregnant	I	N
Breastfeeding	I	N
Not Breastfeeding	VI	N
Infants	I	N
Children	III	N

Parameters for Manual and Auto Assignment

Auto assigned if “Yes” is selected in the Nutrition Interview for the question “Does anyone living in your household smoke inside the home?”

May also be selected in the Risk Panel

Justification

ETS is a mixture of the smoke given off by a burning cigarette, pipe, or cigar (side stream smoke), and the smoke exhaled by smokers (mainstream smoke). ETS is a mixture of about 85% side stream and 15% mainstream smoke (4) made up of over 4,000 chemicals, including Polycyclic Aromatic Hydrocarbons (PAHs) and carbon monoxide (5). Side stream smoke has a different chemical make-up than main-stream smoke. Side stream smoke contains higher levels of virtually all carcinogens, compared to mainstream smoke (6). Mainstream smoke has been more extensively researched than side stream smoke, but they are both produced by the same fundamental processes.

ETS is qualitatively similar to mainstream smoke inhaled by the smoker. The 1986 Surgeon General’s report: The Health Consequences of Involuntary Smoking. A Report of the Surgeon General concluded that ETS has a toxic and carcinogenic potential similar to that of the

mainstream smoke (7). The more recent 2006 Surgeon General's report, The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General, reaffirms and strengthens the findings of the 1986 report, and expands the list of diseases and adverse health effects caused by ETS (8).

ETS is a known human carcinogen (2). Women who are exposed to ETS are at risk for lung cancer and cardiovascular diseases (9). Prenatal or postnatal ETS exposure is related to numerous adverse health outcomes among infants and children, including sudden infant death syndrome (SIDS) (10, 11), upper respiratory infections (12), periodontal disease (13), increased severity of asthma/wheezing (12), metabolic syndrome (14), decreased cognitive function (15), lower birth weight and smaller head circumference (16). Infants born to women exposed to ETS during pregnancy have a small decrease in birth weight and a slightly increased risk of intrauterine growth retardation compared to infants of unexposed women (17).

Studies suggest that the health effects of ETS exposure at a young age could last into adulthood. These include cancer (18), specifically lung cancer (19, 20), and cardiovascular diseases (14, 21, 22,). There is strong evidence that ETS

exposure to the fetus and/or infant results in permanent lung damage (23, 24, 25, 26).

ETS exposure increases inflammation and oxidative stress (27, 28, 29).

Inflammation is associated with asthma (30), cardiovascular diseases (31, 32),

cancer (33), chronic obstructive pulmonary disease (34), and metabolic syndrome (14, 35). PAHs are the major class of compounds that contribute to the ETS-related adverse health outcomes. These compounds possess potent carcinogenic and immunotoxic properties that aggravate inflammation.

Oxidative stress is a general term used to describe the steady state of oxidative damage caused by highly reactive molecules known as free radicals. The free radicals can be generated both during the normal metabolic process and from ETS and other environmental pollutants. When free radicals are not neutralized by antioxidants, they can cause oxidative damage to the cells. This damage has been implicated in the cause of certain diseases. ETS provokes oxidant damage similar to that of active smoking (36).

Antioxidants may modulate oxidative stress-induced lung damage among both smokers and non-smokers (22, 27-29, 37-40). Fruits and vegetables are the major food sources of antioxidants that may protect the lung from oxidative stress (1). Research indicates that consuming fruits and vegetables is more beneficial than taking antioxidant supplements (1). This suggests that other components of fruits and vegetables may be more relevant in protecting the lung from oxidative stress. Dietary fiber is also thought to contribute to the beneficial health effects of fruits and vegetables (1).

The Institute of Medicine (IOM) reports that an increased turnover in vitamin C has been observed in nonsmokers who are regularly exposed to tobacco smoke (41). The increased turnover results in lowered vitamin C pools in the body. Although there are insufficient data to

estimate a special requirement for nonsmokers regularly exposed to ETS, the IOM urges those individuals to ensure that they meet the Recommended Dietary Allowance for vitamin C (36, 41).

The WIC food package supplements the participant intake of vitamin C. In addition, many WIC State Agencies participate in the WIC Farmers' Market Nutrition Program, which provides coupons for participants to purchase fresh fruits and vegetables. WIC Program benefits also include counseling to increase fruit and vegetable consumption, and to promote a healthy lifestyle, such as protecting participants and their children from ETS exposure. WIC staff may also make appropriate referrals to participants, and/or their caregivers, to other health and social services, such as smoking cessation programs.

Clarification

In a comprehensive scientific report, the Surgeon General concluded that there is

no risk-free level of exposure to secondhand smoke (8). However, for the purpose of risk identification, the definition used for this risk criterion is based on the Centers for Disease Control and Prevention (CDC) Pediatric Nutrition Surveillance System (PedNSS) and the Pregnancy Nutrition Surveillance System (PNSS) questions to determine Environmental Tobacco Smoke (ETS) exposure:

1. Does anyone living in your household smoke inside the home? (Infants, children)

2. Does anyone else living in your household smoke inside the home? (Women)

Because the definition used by other Federal agencies for ETS exposure is specific to "inside the home" and has been validated (3), the definition used for WIC eligibility must also be as specific. In addition, FNS encourages the use of the PedNSS and PNSS ETS exposure questions for WIC nutrition assessment. There are other potential sources of ETS exposure, such as work and day care environments. However, no other validated questions/definitions could be found that were inclusive of other environments and applicable to WIC.

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Appendix A: Not Allowed Nutrition Risk Criteria

USDA does not currently allow the following nutrition risk factors.

- Abnormal Postpartum Weight Change
- Accidental Poisoning
- Attention Deficit Hyperactive Disorder/Attention Deficit Disorder
- Chronic or Recurrent Infections – Bronchitis
- Consumption of Fish from Water Contaminated with Toxic Substances
- Drinking Water Contaminated with Nitrate
- Excessive Caffeine Intake
- Food Insecurity
- Food Intolerances other than those specifically allowed (Celiac Disease, Lactose Intolerance, etc.)
- Hemorrhage associated with Pregnancy
- High Parity and Young Age
- History of Post-term Delivery
- Inadequate Diet
- Infant Not Breastfed
- Infant or Child of Woman with Diabetes during Pregnancy
- Infant Taking More than 1 quart of Formula per Day
- Low Level of Maternal Education/Literacy
- Maternal Short Stature
- Nulliparity
- Otitis Media
- Passive Smoking
- Placental Abnormalities
- Pre-pregnancy Underweight for Postpartum Women
- Preeclampsia/Eclampsia
- Pregnancy at Age Older than 35
- Pyloric Stenosis
- Rapid Growth (Not Related to Catch Up Growth)
- Respiratory Infections
- Risk of Anemia: History of Anemia Requiring Treatment
- Smokeless Tobacco
- Smoking for Nonlactating Postpartum Women
- Transfer from Infant to Child Diet
- Urinary Tract Infections
- Vegetarian Diets other than Vegan
- Weight for Age