2.13B ANTHROPOMETRIC RISK CRITERIA DEFINITION AND JUSTIFICATION

101 Underweight (Women)

Definition/Cut-off Value

Underweight for women is defined as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant Women</td>
<td>Prepregnancy Body Mass Index (BMI) &lt;18.5.</td>
</tr>
<tr>
<td>Non-Breastfeeding Women</td>
<td>Prepregnancy or current Body Mass Index (BMI) &lt;18.5.</td>
</tr>
<tr>
<td>Breastfeeding Women less than 6 Months Postpartum</td>
<td>Prepregnancy or current Body Mass Index (BMI) &lt;18.5.</td>
</tr>
<tr>
<td>Breastfeeding Women 6 Months Postpartum or More</td>
<td>Current Body Mass Index (BMI) &lt;18.5.</td>
</tr>
</tbody>
</table>

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 status categories 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

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<thead>
<tr>
<th>Category</th>
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<tr>
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<td>I</td>
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<tr>
<td>Breastfeeding Women</td>
<td>I</td>
</tr>
<tr>
<td>Non-Breastfeeding Women</td>
<td>III, IV, V or VI</td>
</tr>
</tbody>
</table>

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. Prepregnancy 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 (2).

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 prepregnancy 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. Prepregnancy 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 prepregnancy weight. In most cases therefore, prepregnancy 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 or all of which need to be addressed (4).

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) infant(s), 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.

References


Additional References


BMI Table for Determining Weight Classification for Women (1)

<table>
<thead>
<tr>
<th>Height (Inches)</th>
<th>Underweight BMI &lt;18.5</th>
<th>Normal Weight BMI 18.5-24.9</th>
<th>Overweight BMI 25.0-29.9</th>
<th>Obese BMI &gt;30.0</th>
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<tr>
<td>58&quot;</td>
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<td>&lt;137 lbs</td>
<td>137-183 lbs</td>
<td>184-220 lbs</td>
<td>&gt;220 lbs</td>
</tr>
</tbody>
</table>

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

**Definition/Cut-off Value**

Underweight and at risk of underweight are defined as follows:

<table>
<thead>
<tr>
<th>Weight Classification</th>
<th>Age</th>
<th>Cut-off Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>Birth to &lt; 24 months</td>
<td>≤ 2.3rd percentile weight-for-length as plotted on the Centers for Disease Control and Prevention (CDC) Birth to 24 months gender specific growth charts (1).*</td>
</tr>
<tr>
<td></td>
<td>2-5 years</td>
<td>≤ 5th percentile Body Mass Index (BMI)-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).</td>
</tr>
<tr>
<td>At Risk of Underweight</td>
<td>Birth to &lt; 24 months</td>
<td>&gt; 2.3rd percentile and ≤ 5th percentile weight-for-length as plotted on the CDC Birth to 24 months gender specific growth charts (1).*</td>
</tr>
<tr>
<td></td>
<td>2-5 years</td>
<td>&gt;5th percentile and ≤ 10th percentile BMI-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).</td>
</tr>
</tbody>
</table>

*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.

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

**Participant Category and Priority Level**

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children</td>
<td>III</td>
</tr>
</tbody>
</table>
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, 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.

References


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 2\textsuperscript{nd} percentile on the hard copy Birth to 24 months growth charts. Electronic charts should use the 2.3\textsuperscript{rd} percentile as the cut-off.
111 Overweight (Women)

**Definition/Cut-off Value**

Overweight for women is defined as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Cut-off Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant Women</td>
<td>Prepregnancy Body Mass Index (BMI) ≥ 25</td>
</tr>
<tr>
<td>Non-Breastfeeding Women</td>
<td>Prepregnancy Body Mass Index (BMI) ≥ 25</td>
</tr>
<tr>
<td>Breastfeeding Women less than 6 Months Postpartum</td>
<td>Prepregnancy Body Mass Index (BMI) ≥ 25</td>
</tr>
<tr>
<td>Breastfeeding Women 6 Months Postpartum or more</td>
<td>Current Body Mass Index (BMI) ≥ 25</td>
</tr>
</tbody>
</table>

Note: A BMI table is attached to assist in determining weight classifications. 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**

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**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 during pregnancy. 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 prepregnancy 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 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. Prepregnancy 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 prepregnancy weight. In most cases, therefore, prepregnancy 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 has increased 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.

References


Additional References


**BMI Table for Determining Weight Classification for Women (1)**

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<tr>
<th>Height (Inches)</th>
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</tr>
</tbody>
</table>

113 Obese (Children 2-5 Years of Age)

Definition/Cut-off Value

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

<table>
<thead>
<tr>
<th>Age</th>
<th>Cut-Off Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 years</td>
<td>≥ 95\textsuperscript{th} percentile Body Mass Index (BMI) or weight-</td>
</tr>
<tr>
<td></td>
<td>for-stature as plotted on the 2000 Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td></td>
<td>(CDC) 2-20 years gender specific growth charts (1,2) (available at:</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.cdc.gov/growthcharts">www.cdc.gov/growthcharts</a>).*</td>
</tr>
</tbody>
</table>

*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

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children (2-5 years of age)</td>
<td>III</td>
</tr>
</tbody>
</table>

Justification

The rapid rise in the prevalence of 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 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 ≥85\textsuperscript{th} and <95\textsuperscript{th} percentile are considered overweight and those at or above the 95\textsuperscript{th} percentile, obese (4). Research on BMI and body fatness shows that the majority of children with BMI-for-age at or above the 95\textsuperscript{th} percentile have high adiposity and less than one-half of the children in the 85\textsuperscript{th} 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 95\textsuperscript{th} 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.

**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/foodfunfamilies.htm)
- [MyPyeramid 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.
References


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.
## Overweight or At Risk of Overweight (Infants and Children)

### Definition/Cut-Off Value

<table>
<thead>
<tr>
<th>Weight Classification</th>
<th>Age</th>
<th>Definition/Cut-off value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overweight</strong></td>
<td>2 - 5 years</td>
<td>≥85&lt;sup&gt;th&lt;/sup&gt; and &lt;95&lt;sup&gt;th&lt;/sup&gt; 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).*</td>
</tr>
<tr>
<td><strong>At Risk of Overweight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;12 months (infant of obese mother)</td>
<td></td>
<td>Biological mother with a BMI ≥ 30 at the time of conception or at any point in the first trimester of pregnancy.**</td>
</tr>
<tr>
<td>≥12 months (child of obese mother)</td>
<td></td>
<td>Biological mother with a BMI ≥ 30 at the time of 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.)</td>
</tr>
<tr>
<td>Birth to 5 years (infant or child of obese father)</td>
<td></td>
<td>Biological father with a BMI ≥ 30 at the time of certification.**</td>
</tr>
</tbody>
</table>

* 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](http://www.cdc.gov/growthcharts).

### Participant Category and Priority Level

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children</td>
<td>III</td>
</tr>
</tbody>
</table>
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).

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:


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.

References

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.

Abbreviated Body Mass Index (BMI) Table*

<table>
<thead>
<tr>
<th>Height</th>
<th>Inches</th>
<th>Weight (lbs) equal to BMI 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' 10&quot;</td>
<td>58</td>
<td>143</td>
</tr>
<tr>
<td>4' 11&quot;</td>
<td>59</td>
<td>148</td>
</tr>
<tr>
<td>5' 0&quot;</td>
<td>60</td>
<td>153</td>
</tr>
<tr>
<td>5' 1&quot;</td>
<td>61</td>
<td>158</td>
</tr>
<tr>
<td>5' 2&quot;</td>
<td>62</td>
<td>164</td>
</tr>
<tr>
<td>5' 3&quot;</td>
<td>63</td>
<td>169</td>
</tr>
<tr>
<td>5' 4&quot;</td>
<td>64</td>
<td>174</td>
</tr>
<tr>
<td>5' 5&quot;</td>
<td>65</td>
<td>180</td>
</tr>
<tr>
<td>5' 6&quot;</td>
<td>66</td>
<td>186</td>
</tr>
<tr>
<td>5' 7&quot;</td>
<td>67</td>
<td>191</td>
</tr>
<tr>
<td>5' 8&quot;</td>
<td>68</td>
<td>197</td>
</tr>
<tr>
<td>5' 9&quot;</td>
<td>69</td>
<td>203</td>
</tr>
<tr>
<td>5' 10&quot;</td>
<td>70</td>
<td>209</td>
</tr>
<tr>
<td>5' 11&quot;</td>
<td>71</td>
<td>215</td>
</tr>
<tr>
<td>5' 12&quot;</td>
<td>72</td>
<td>221</td>
</tr>
<tr>
<td>6' 1&quot;</td>
<td>73</td>
<td>227</td>
</tr>
<tr>
<td>6' 2&quot;</td>
<td>74</td>
<td>233</td>
</tr>
<tr>
<td>6' 3&quot;</td>
<td>75</td>
<td>240</td>
</tr>
</tbody>
</table>

*This table may be used to determine parental (male or female) obesity (BMI > 30).
Source

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:

<table>
<thead>
<tr>
<th>Age</th>
<th>Cut-Off Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to &lt; 24 months</td>
<td>≥ 97.7th percentile weight-for-length as plotted on the Centers for Disease</td>
</tr>
<tr>
<td></td>
<td>Control and Prevention (CDC), Birth to 24 months gender specific growth</td>
</tr>
<tr>
<td></td>
<td>charts (1) (available at: <a href="http://www.cdc.gov/growthcharts">www.cdc.gov/growthcharts</a>).*</td>
</tr>
</tbody>
</table>

*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

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children (&lt; 24 months of age)</td>
<td>III</td>
</tr>
</tbody>
</table>

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 to 1994) 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 97.7\textsuperscript{th} percentile. Thus, an infant or child (< 24 months) is categorized as high weight-for-length when plotted at or above the 97.7\textsuperscript{th} percentile, labeled as the 98\textsuperscript{th} 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:


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.

**References**


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 97.7\textsuperscript{th} percentile; however, for ease of use, CDC labels it as the 98\textsuperscript{th} percentile on the hard copy Birth to 24 months growth charts. Electronic charts should use the 97.7\textsuperscript{th} percentile as the cut-off.
121 Short Stature or At Risk of Short Stature (Infants and Children)

**Definition/Cut-Off Value**

Short Stature and at risk of short stature are defined as follows:

<table>
<thead>
<tr>
<th>Height Classification</th>
<th>Age</th>
<th>Cut-off value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Stature</td>
<td>Birth to &lt; 24 months</td>
<td>≤ 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).*</td>
</tr>
<tr>
<td></td>
<td>2 – 5 years</td>
<td>≤ 5th percentile stature-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).</td>
</tr>
<tr>
<td>At Risk of Short Stature</td>
<td>Birth to &lt; 24 months</td>
<td>&gt; 2.3rd percentile and ≤ 5th percentile length-for-age as plotted on the CDC Birth to 24 months gender specific growth charts (1).*</td>
</tr>
<tr>
<td></td>
<td>2 – 5 years</td>
<td>&gt; 5th percentile and ≤ 10th percentile stature-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).</td>
</tr>
</tbody>
</table>

*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](http://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

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children</td>
<td>III</td>
</tr>
</tbody>
</table>

Justification

The CDC uses the 2.3<sup>rd</sup> percentile (for birth to 24 months of age) and the 5<sup>th</sup> 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.
References


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.
131 Low Maternal Weight Gain

Definition/Cut-off Value

Low maternal weight gain is defined as follows:

1. A low rate of weight gain, such that in the 2nd and 3rd trimesters, for singleton pregnancies (1,2):

<table>
<thead>
<tr>
<th>Prepregnancy Weight Classification</th>
<th>BMI</th>
<th>Total Weight Gain (lbs.)/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5 to 24.9</td>
<td>&lt; 0.8</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 to 29.9</td>
<td>&lt; 0.5</td>
</tr>
<tr>
<td>Obese</td>
<td>≥ 30.0</td>
<td>&lt; 0.4</td>
</tr>
<tr>
<td>Multi-fetal Pregnancies</td>
<td></td>
<td>See Justification for more information.</td>
</tr>
</tbody>
</table>

Note: A BMI table is attached to assist in determining weight classifications. 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.)

2. 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 prepregnancy weight category as follows (1,2):

<table>
<thead>
<tr>
<th>Prepregnancy Weight Classification</th>
<th>BMI</th>
<th>Total Weight Gain Range (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>28-40</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5 to 24.9</td>
<td>25-35</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 to 29.9</td>
<td>15-25</td>
</tr>
<tr>
<td>Obese</td>
<td>≥ 30.0</td>
<td>11-20</td>
</tr>
<tr>
<td>Multi-fetal Pregnancies</td>
<td></td>
<td>See Justification for more information.</td>
</tr>
</tbody>
</table>

Note: A BMI table is attached to assist in determining weight classifications. 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant</td>
<td>I</td>
</tr>
</tbody>
</table>

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 prepregnancy weight status categories are associated with improved maternal and child health outcomes (1). Included in these 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 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 of the 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.

References


Additional References


Clarification

The Centers for Disease Control and Prevention (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.
### (BMI) Table for Determining Weight Classification for Women (1)

<table>
<thead>
<tr>
<th>Height (Inches)</th>
<th>Underweight BMI &lt; 18.5</th>
<th>Normal Weight BMI 18.5-24.9</th>
<th>Overweight BMI 25.0-29.9</th>
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<tr>
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</tr>
<tr>
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<td>105-140 lbs</td>
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<td>137-183 lbs</td>
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<td>&gt; 220 lbs</td>
</tr>
</tbody>
</table>

**133 High Maternal Weight Gain**

**Definition/Cut-off Value**

**Pregnant Women:**

1. A high rate of weight gain, such that in the 2nd and 3rd trimesters, for singleton pregnancies (1):

<table>
<thead>
<tr>
<th>Pregnancy Weight Classification</th>
<th>BMI</th>
<th>Total Weight Gain (lbs.)/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>&gt; 1.3</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5 to 24.9</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 to 29.9</td>
<td>&gt; 0.7</td>
</tr>
<tr>
<td>Obese</td>
<td>≥ 30</td>
<td>&gt; 0.6</td>
</tr>
</tbody>
</table>

Multi-fetal Pregnancies: See Justification for more information

Note: A BMI 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 prepregnancies, 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.)

2. 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 prepregnancy weight category (see below).

**Breastfeeding or Non-Breastfeeding Women (most recent pregnancy only):**

Total gestational weight gain exceeding the upper limit of the IOM’s recommended range (2) based on Body Mass Index (BMI) for singleton pregnancies, as follows (1):

<table>
<thead>
<tr>
<th>Pregnancy Weight Classification</th>
<th>BMI</th>
<th>Total Weight Gain (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>&gt; 40</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5 to 24.9</td>
<td>&gt; 35</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 to 29.9</td>
<td>&gt; 25</td>
</tr>
<tr>
<td>Obese</td>
<td>≥ 30</td>
<td>&gt; 20</td>
</tr>
</tbody>
</table>

Multi-fetal Pregnancies: See Justification for more information

Note: A BMI 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 prepregnancies, the same BMI cut-offs will be used for all women, regardless of age, when determining WIC eligibility. (See
| Participant Category and Priority Level |
|-------------------------|-----------------|
| Category                | Priority        |
| Pregnant Women          | I               |
| Breastfeeding Women     | I               |
| Non-Breastfeeding Women | III, IV, V or VI |

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).

Childhood obesity is one of the most important long-term health outcomes related to high maternal weight gain. A number of epidemiologic studies show that high 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 (2). 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 prepregnancy 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 of the 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). 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 (3). 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 (3). 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 (4). 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.

References


Additional References


Clarification

The Centers for Disease Control and Prevention (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.

### BMI Table for Determining Weight Classifications for Women (1)

<table>
<thead>
<tr>
<th>Height (Inches)</th>
<th>Underweight BMI &lt; 18.5</th>
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</tbody>
</table>

134 Failure to Thrive

Definition/Cut-off Value

Presence of failure to thrive (FTT) 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: 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children</td>
<td>III</td>
</tr>
</tbody>
</table>

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
- 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).

References


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.
135 Slowed/Faltering Growth Pattern

**Definition/Cut-off Value**

Slowed/Faltering Growth is defined as:

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

**Participant Category and Priority Level**

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants ≤ 6 Months of Age</td>
<td>I</td>
</tr>
</tbody>
</table>

**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:

<table>
<thead>
<tr>
<th>Interval (mo)</th>
<th>Girls (g/day)</th>
<th>Boys (g/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>30</td>
<td>33</td>
</tr>
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<td>1-2</td>
<td>28</td>
<td>34</td>
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<td>4-5</td>
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<td>5-6</td>
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</tr>
<tr>
<td>6-7</td>
<td>12</td>
<td>11</td>
</tr>
</tbody>
</table>

**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 delay.

**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, pregravid BMI >27, pregnancy-induced hypertension, flat/inverted nipples, vitamin B12 deficiency.
- Meal time 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: 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).

References

15. Flaherman VJ, Schafer EW, Kuzniewicz MW, Li SX, Walsh EM, Paul IM. Key weight loss nomograms for exclusively breastfed newborns. Ped. 2015;135(1)e16-23.


141 Low Birth Weight and Very Low Birth Weight

Definition/Cut-off Value

Low birth weight and very low birth weight are defined as follows:

<table>
<thead>
<tr>
<th>Weight Classification</th>
<th>Cut-off Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Birth Weight (LBW)</td>
<td>Birth weight defined as ( \leq 5 ) pounds 8 ounces (( \leq 2500 ) g), for infants and children less than 24 months.</td>
</tr>
<tr>
<td>Very Low Birth Weight (VLBW)</td>
<td>Birth weight defined as ( \leq 3 ) pounds 5 ounces (( \leq 1500 ) g), for infants and children less than 24 months.</td>
</tr>
</tbody>
</table>

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 information about the anthropometric assessment and nutritional care of LBW and VLBW infants.

Participant Category and Priority Level

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children &lt; 24 months</td>
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Justification

Low birth weight is one of the most important biologic predictors of infant death and deficiencies in physical and mental development during childhood among those babies who survive and continues to be a strong predictor of growth in early childhood. Infants and children born with LBW/VLBW, particularly if caused by fetal growth restriction, need an optimal nutrient intake to survive, meet the needs of an extended period of relatively rapid postnatal growth, and complete their growth and development (1).

References


Additional Reference

142 Preterm or Early Term Delivery

Definition/Cut-off Value

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

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

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

Participant Category and Priority Level

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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.

References


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**

Infants and children less than 24 months of age diagnosed as small for gestational age.

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.

**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**

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**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, hypocalcaemia, 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.

**References**


**Additional References**

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.
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:

<table>
<thead>
<tr>
<th>Age</th>
<th>Cut-Off Value</th>
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<tbody>
<tr>
<td>Birth to &lt; 24 months</td>
<td>&lt; 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: <a href="http://www.cdc.gov/growthcharts">www.cdc.gov/growthcharts</a>).*</td>
</tr>
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* 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.

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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.

References


Clarification

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

Definition/Cut-off Value

Birth weight ≥ 9 pounds (≥ 4000 g); or

Presence of large for gestational age. 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.

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Justification

Infant mortality rates are higher among full-term infants who weigh greater than 4,000 g (greater than 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 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).

References


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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