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:

Age	Cut-Off Value
Birth to < 24 months	≥ 97.7th percentile weight-for-length as plotted on the Centers for Disease Control and Prevention (CDC), Birth to 24 months gender specific growth charts (1) (available at: www.cdc.gov/growthcharts).*
**Based on the 2006 World Health Organization (WHO) international growth standards (2). CDC labels the 97.7th percentile as the 98th percentile on the Birth to 24 months gender specific growth charts. For more information about the percentile cut-off, please see Clarification.*	

Participant Category and Priority Level

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

Justification

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

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

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

The 2000 CDC charts for infants and children < 36 months are based on birth weight (from 1968 to 1980 and from 1985 to 1994) and birth length data (from 1989 to1994) obtained from U.S. birth certificates; National Health and Nutrition Examination Survey (NHANES) data; and, measurements from infants who had been breastfed and formula fed (approximately 50% ever breastfed and approximately 33% who were

still breastfeeding at 3 months). Very low birth weight infants were not included in the sample population. This was the only exclusion criterion applied to the sample population (2, 3).

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

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

Implications for WIC Nutrition Services

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

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

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

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

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

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3. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. CDC growth charts: United States. Advance data from vital and health statistics; no. 314. Hyattsville, Maryland: National Center for Health Statistics. 2000.
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6. U.S. Department of Health and Human Services. The Surgeon General's vision for a healthy and fit nation. Rockville (MD): U.S. Department of Health and Human Services, Office of the Surgeon General. 2010.
7. Anzman SL, Rolllins BY, Birch LL. Parental influence on children's early eating environments and obesity risk: implications for prevention. International Journal of Obesity 34, 1116-1124 (July 2010).
8. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. Pediatrics 2007; 120 Suppl 4:S103-S228.

Clarification

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