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:

Height Classification	Age	Cut-off value
Short Stature	Birth to < 24 months	≤ 2.3rd percentile length-for-age as plotted on the Centers for Disease Control and Prevention (CDC) Birth to 24 months gender specific growth charts (1).*
	2 – 5 years	≤ 5th percentile stature-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).
At Risk of Short Stature	Birth to < 24 months	> 2.3rd percentile and ≤ 5th percentile length-for-age as plotted on the CDC Birth to 24 months gender specific growth charts (1).*
	2 – 5 years	> 5th percentile and ≤ 10th percentile stature-for-age as plotted on the 2000 CDC age/gender specific growth charts (2).

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

Notes:

1. The Birth to 24 months and the 2000 CDC growth charts are available at: www.cdc.gov/growthcharts.
2. For premature infants and children (with a history of prematurity) up to 2 years of age, assignment of this risk criterion will be based on adjusted gestational age. For information about adjusting for gestational age see: Guidelines for Growth Charts and Gestational Age Adjustment for Low Birth Weight and Very Low Birth Weight Infants.

Participant Category and Priority Level

Category	Priority
Infants	I
Children	III

Justification

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

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

Demonstrable differences in stature exist among children of different ethnic and racial groups. However, racial and ethnic differences are relatively minor compared with environmental factors (1). Growth patterns of children of racial groups whose short stature has traditionally been attributed to genetics have been observed to increase in rate and in final height under conditions of improved nutrition (5, 6).

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

Implications for WIC Nutrition Services

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

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

References

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5. World Health Organization. WHO child growth standards: Length/height-for-age, weight-for-age, weight for height and body mass index-for-age: Methods and development. Geneva, Switzerland: World Health Organization; 2006. Available at: http://www.who.int/childgrowth/publications/technical_report_pub/en/index.html. Accessed September 2010.
6. Institute of Medicine. WIC nutrition risk criteria a scientific assessment. Washington (DC): National Academy Press; 1996. p. 104-109.
7. Pipes PL, Trahms CM. Nutrition in infancy and childhood, 6th edition. Seattle (WA): WCB/McGraw-Hill; 1997. p. 2.
8. Berhane R, Dietz WH. Clinical assessment of growth. In: Kessler DB, Dawson P., editors. Failure to thrive and pediatric undernutrition: A transdisciplinary approach. Baltimore (MD): Paul H. Brooks Publishing Company, Inc.; 1999. p. 199.
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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.