# Growth and Development

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SECTION 2

## THE HEALTH MAINTENANCE VISIT

The frequent office visits for health maintenance in the first 2 years of life are more than *physicals*. Although a somatic history and physical examination are important parts of each visit, many other issues are discussed, including nutrition, behavior, development, safety, and **anticipatory guidance**.

Disorders of growth and development are often associated with chronic or severe illness or may be the only symptom of parental neglect or abuse. Although normal growth and development does not eliminate a serious or chronic illness, in general, it supports a judgment that a child is healthy except for acute, often benign, illnesses that do not affect growth and development.

The processes of growth and development are intertwined. However, it is convenient to refer to **growth** as the increase in size and **development** as an increase in function of processes related to body and mind. Being familiar with normal patterns of growth and development allows those practitioners who care for children to recognize and manage abnormal variations.

The genetic makeup and the physical, emotional, and social environment of the individual determine how a child grows and develops throughout childhood. One goal of pediatrics is to help each child achieve his or her individual potential through periodically monitoring and screening for the normal progression or abnormalities of growth and development. The American Academy of Pediatrics recommends routine office visits in the first week of life (depending on timing of nursery discharge) at 2 weeks; at 1, 2, 4, 6, 9, 12, 15, and 18 months; at 2, 2½, and3 years; then annually through adolescence/young adulthood (Fig. 9-1).

Chapter 5

# NORMAL GROWTH

Deviations in growth patterns may be nonspecific or may be important indicators of serious and chronic medical disorders. An accurate measurement of length/height, weight, and head circumference should be obtained at every health supervision visit and compared with statistical norms on growth charts. Table 5-1 summarizes several convenient benchmarks to evaluate normal growth. Serial measurements are much more useful than single measurements to detect deviations from a particular growth pattern, even if the value remains within statistically defined normal limits (percentiles). Following the trend helps define whether growth is within acceptable limits or warrants further evaluation.

Growth is assessed by plotting accurate measurements on growth charts and comparing each set of measurements with previous measurements obtained at health visits. Please see examples in Figures 5-1 to 5-4. Complete charts can be found at www.cdc.gov/growthcharts/who_charts.htm for birth to 2 years and www.cdc.gov/growthcharts for 2 to 20 years. The body mass index is defined as body weight in kilograms divided by height in meters squared; it is used to classify adiposity and is recommended as a screening tool for children and adolescents to identify those overweight or at risk for being overweight (see Chapter 29).

Normal growth patterns have spurts and plateaus, so some shifting on percentile graphs can be expected. Large shifts in percentiles warrant attention, as do large discrepancies in height, weight, and head circumference percentiles. When caloric intake is inadequate, the weight percentile falls first, then the height, and the head circumference is last. Caloric intake may be poor as a result of inadequate feeding or because the child is not receiving adequate attention and stimulation (*nonorganic* failure to thrive [see Chapter 21]).

Caloric intake also may be inadequate because of increased caloric needs. Children with chronic illnesses, such as heart failure or cystic fibrosis, may require a significantly higher caloric intake to sustain growth. An increasing weight percentile in the face of a falling height percentile suggests hypothyroidism. Head circumference may be disproportionately

**Table 5-1** Rules of Thumb for Growth

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| **WEIGHT** |
| Weight loss in first few days: 5%–10% of birth weight |
| Return to birth weight: 7–10 days of age |
| Double birth weight: 4–5 months |
| Triple birth weight: 1 year |
| Daily weight gain: |
| 20–30 g for first 3–4 months |
| 15–20 g for rest of the first year |
| **HEIGHT** |
| Average length: 20 in. at birth, 30 in. at 1 year |
| At age 4 years, the average child is double birth length or 40 in. |
| **HEAD CIRCUMFERENCE (HC)** |
| Average HC: 35 cm at birth (13.5 in.) |
| HC increases: 1 cm per month for first year (2 cm per month for first 3 months, then slower) |