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Baby Steps in the Prevention of Childhood Obesity: IOM Guidelines for Pediatric Practice

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The aim of this paper is to present an overview of the infancy-related guidelines from the Institute of Medicine (IOM, 2011) report "Early Childhood Obesity Prevention Policies" and highlight research studies that support their implementation in pediatric practice. Findings from recent studies of infant growth monitoring, feeding, sleep, and physical activity are presented. Research strategies that may be applied to today's clinical assessments and interventions are specified. Participation by pediatric nurses in the development of future multi-component interventions to prevent rapid infant weight gain is recommended.

Benjamin is being seen today for his 6-month well child visit at a pediatric clinic that cares for low-income families. At birth, his weight-for-length was at the 25th percentile according to World Health Organization growth charts. Today it is at the 97th percentile. His parents are proud of his weight gain. They moved to the Washington, D.C., area from their native El Salvador three years ago. Both work in a local restaurant. A trusted friend cares for Benjamin eight hours/day, six days/week. His mother reports that for approximately five hours/day, Benjamin is strapped in a car seat in front of the television, because he "likes the movement on TV." She is pleased with this arrangement because he is "safe." He is breastfed in the evening; otherwise he receives infant formula. When he was two months old, his babysitter added rice cereal to his formula "to help him sleep" and gradually added other solid foods to his diet. Benjamin's story is not uncommon.

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Background

Childhood obesity is a global problem. The World Health Organization (WHO) estimates that over 40 million children under 5 years of age are overweight or obese. While once considered a public health issue primarily for high-income countries, childhood obesity rates are rising quickly in middle- and low-income countries, particularly in urban areas (World Health Organization, 2012). The significance of this change in child health status throughout the world is the long term health consequences of obesity, including cardiovascular morbidities and early development of type 2 diabetes.

International studies provide evidence that excess weight gain during infancy is a significant risk factor for later obesity. A population-based study of infants from the United States (US) found a positive association between rapid weight gain in the first 4 months of life and overweight status at 7 years of age (Stettler, Zemel, Kumanyika, & Stallings, 2002). For American children from low-income minority

families, excessive weight gain in the first year of life has been associated with a nine-fold increased risk for obesity at age 3 years (Goodell, Wakefield, & Ferris, 2009). Similarly, higher weight-for-length *z*-scores at 6 months of age have been associated with the increased odds of obesity at 3 years of age (Taveras et al., 2009). These findings are consistent with those of the Avon Longitudinal Study of Parents and Children in England that found rapid weight gain in the first year to be a risk factor for obesity at age 7 years (Reilly et al., 2005). The accumulating research evidence from these studies points to the need for obesity prevention practice guidelines that begin early in life.

In response to the childhood obesity epidemic, the Institute of Medicine (Institute of Medicine (IOM), 2011) has developed practice guidelines for preventing childhood obesity. Unlike previous public health initiatives that have focused primarily on school age children, the IOM's *Early Childhood Obesity Prevention Policies* targets factors related to overweight and obesity from birth to 5 years of age. The IOM infancy-related guidelines are focused on growth monitoring, healthy feeding, sleep, and physical activity. The purpose of this paper is to present an overview of the IOM infancy-related guidelines and highlight research studies that support their implementation in clinical practice.

Infant Growth Monitoring

The IOM guideline for measuring infant growth is to plot height and weight on WHO growth charts. The rationale supporting use of WHO charts is that the data used to generate these growth curves were collected from a large cohort of children from varying cultures and countries, including Brazil, Ghana, India, Norway, Oman and the US. Additionally, the WHO charts were generated using sample inclusion criteria that specified breastfeeding up to age 12 months, introduction of solid foods at approximately age 6 months, absence of maternal smoking, and living in a household with adequate income (de Onis et al., 2004). This approach to sampling was designed to generate benchmark curves that reflect an ideal growth trajectory for comparison to individual patterns (Garza & de Onis, 2004). Further, the IOM (2011) guideline for growth monitoring in infancy calls for tracking weight-for-length changes throughout the first year and identifying babies at risk for overweight (84.1st–97.7th percentile) and overweight (>97.7th percentile).

With respect to growth monitoring, the WHO growth charts also provide useful application for clinical practice. For parents like Benjamin's who are from countries where food scarcity is prevalent, the overweight status of their infant as seen on the growth chart may be viewed with pride and considered to be a marker for good health and successful parenting. Misconceptions about healthy weight gain, however, are not limited to parents from low income countries. Researchers in the Netherlands found that a substantial proportion of parents, regardless of educational attainment and socio-demographic background, did not recognize overweight status in their own children (Jansen & Brug, 2006). Similarly, a recent study in the US found that over 80% of mothers of overweight toddlers were satisfied with their child's body size and inaccurately assessed their weight as being within a normal range for age (Hager et al., 2012). Another study used a simple assessment measure that can be easily incorporated into a regularly scheduled well child visit (Chaparro, Langellier, Kim, & Waley, 2011). The researchers asked the question "Do you consider your child be overweight, underweight, or about right weight for (his)(her) height?" Almost all mothers classified their overweight or obese child as being about the right weight (93.6% and 77.5%, respectively). While this study focused on preschoolers, using a comparable question for parents of infants may open the door for anticipatory guidance to prevent the rapid or excess infant weight gain that leads to later obesity.

Infant Feeding

The IOM's (2011) infancy-related guidelines for the prevention of childhood obesity call for health care providers to encourage exclusive breastfeeding in the first 6 months and continuation of breastfeeding with the introduction of solid foods during the second half of infancy. Further, the report underscores the importance of helping parents recognize and respond to infant hunger and fullness cues. Examples of hunger cues in early infancy include sucking on fist, waking and tossing, and opening mouth while feeding to indicate wanting more. Conversely, infant cues to satiety or fullness include behaviors such as turning head away, sealing lips, and decreasing or stopping sucking (USDA, 2013).

To date, the findings from health care research related to the healthy infant feeding component of the IOM guidelines are inconsistent. One systematic review of eight international studies of breastfeeding duration and risk for overweight or obesity in later childhood found that only half of the studies reported a dose response of breastfeeding after adjusting for other known risk factors for obesity (Arenz, Rükerl, Koletzko, & von Kries, 2004). A meta-analysis of the same relationship was conducted using 17 studies from seven countries in Europe and North America (Harder, Bergmann, Kallischnigg, & Plagemann, 2005). The findings strongly supported a dose-dependent association between longer breastfeeding duration and reduced risk for later obesity. However, due to methodological differences across studies, adjustment for potential confounders could not be calculated. A later study found a relationship between breastfeeding duration and overweight at age 4 years, but when the researchers controlled