Intervention Research to Prevent Early Childhood Obesity

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Prevalence of Obesity among Young Children, U.S 2011-2012

Ogden, Carroll, Kit, & Flegal, 2014
• RR for overweight among overweight infants (vs. non-overweight) at 1, 2, 3, and 4 years was 4.3, 3.5, 3.3, and 2.9 respectively

• 62.5% of overweight 3 year olds still overweight at 4 years old vs. only 4.1% of non-overweight 3 year olds (RR = 15.2) (Mei et al., 2003)

• Median age at which overweight or obese children became overweight

  22 months; 25% at or before 5 months

  If taking into account overweight at first visit: 15 months; 25% at or before 3 months (Harrington et al., 2010)
The Importance of Caregiving in Infant Nutrition

- Dependent nature of the infant:
  - Type
  - Frequency
  - Duration
  - Amount
  - Method

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- Obesity intervention components have included among other strategies:
  - teaching caregivers strategies for improving infant sleep quality/duration
  - increasing infant physical activity,
  - providing nutritional education to support breastfeeding,
  - increasing food variety,
  - appropriate timing of complementary food introduction,
  - and, increased responsiveness to infant hunger and satiety cues.

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- These studies report improvements in several factors that have been associated with obesity risk, including:
  - improved infant sleep,
  - less TV exposure,
  - decreased sweet/juice intake,
  - delayed introduction of solids,
  - increased breastfeeding duration and/or rates,
  - and increased parental responsiveness (self-reported) to infant hunger and satiety cues.

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Most studies have failed to impact significantly BMI or Weight/Length.

- Two have found a decrease in either weight for length % or BMI while two other studies have noted an increase in weight and length or BMI.

- Of importance regarding safety, none of the intervention studies reviewed demonstrated concerning weight loss or growth delay.
Intervention Research

Completed Interventions (N = 26)
Ongoing Interventions (N = 47)

Can infants self-regulate energy intake?

Fomon et al., (1975)
Can infants self-regulate energy intake?
Energy intake self-regulation has also been demonstrated in preschool and elementary school age children, though with less precision.

This capacity appears to increasingly diminish in the years following toddlerhood, at least in short-term protocols.

The first 2 years of life may be a critical period. (Kral, 2007)
Behavioral Self-Regulation

- The way individuals monitor and manage emotional, social, and cognitive resources in response to internal or external stimulation so that goals may be attained (Blair, Calkins, & Kopp, 2010).

- Regulatory abilities emerge gradually over time and interact with caregiving experience.
The path to independence...

- Almost complete reliance on caregivers during infancy (co-regulation)
- More independence emerges with age
- The way that caregivers respond to the needs of their infants may influence developing methods for modulating stress (Calkins et al., 1998; Thompson, 1994).
Enhancing Caregiver-Infant Communication to Prevent Obesity

- We are testing a novel intervention combining infant sign language training and targeted knowledge of infant development and nutrition to help parents and preverbal infants better understand one another during feeding.

- Unique methodology, combining:
  - behavioral observation
  - cardiac measures of autonomic regulation,
  - anthropometric and self-report data

- Will offer new insight into how self-regulation of energy intake develops during infancy.

eat / food

more
Enhancing Caregiver-Infant Communication to Prevent Obesity

- Using the Sign with Your Baby program, we will teach mothers American Sign Language (ASL) signs indicative of hunger, thirst, and satiety, which they will in turn teach their preverbal infant to add to the infant’s repertoire cues.

- The use of signs with hearing infants has been shown to facilitate communication and caregiver responsiveness.

- This training in ASL will be augmented with targeted information for mothers about infants’ capacities to:
  - self-regulate energy intake in response to hunger and satiety,
  - communicate those states with intention,
  - understand language before they can verbalize, and
  - use non-verbal means, such as ASL, to communicate hunger and fullness.

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Enhancing Caregiver-Infant Communication to Prevent Obesity

- Mothers also will be taught about:
  - expected development of infants' eating behaviors, and
  - nutritional requirements to support healthy growth that can be adapted in light of culture and socioeconomic status (SES).

- Mothers were to be educated through the existing framework of Parents as Teachers (PAT), a nationally recognized home visiting program to support early childhood development, but we have had to alter our plans in light of low recruitment through PAT.
Methods

- Home visits start about 45 minutes before a normal feeding time.

- The infant’s length and weight (in clean diaper only) are measured in triplicate, using a calibrated length board and digital scale.
Methods

- We are using REDCap (Research Electronic Data Capture) in the field with iPads for questionnaires and anthropometric data. This allows for offline data capture with subsequent synchronization once reconnected to the Web.
*References available upon request