Disclosures

• I do not have any disclosures for this presentation

Learning Objectives

• Discuss research evidence describing the role of biomarkers present during pregnancy, at delivery and the first 1000 days of life, and correlate with anthropometric measurements of newborns, infants and toddler for early identification of infant and toddler overweight.
• Analyze cases to determine appropriate times for interventions and anticipatory guidance to prevent overweight and obesity in the first 1000 days of life.

Additional Learning Objectives

• Discuss the evidence-based literature for the prevention of overweight and obesity in the ‘First 1000-Days of Life’.
• Apply principles of advanced-practice for the prevention of overweight and obesity in the ‘First 1000-Days of Life’.
• Analyze the relationship between breastfeeding decision-making and overweight and obesity.
• Evaluate anticipatory guidance recommendations for parents concerning the prevention of overweight and obesity in the ‘First 1000-Days of Life’.

Healthy People 2020 Goal

• Percentage of children breastfed ever
• At 6-months
• At 1-year
• Exclusively breastfed through 3 and 6 months

Breastfeeding for Obesity Preventive

www.cdc.gov
### Factors Contributing to Childhood Obesity

- **Social and cultural influences**
- **Environmental factors**
- **Genetic factors**

### Why Examine the ‘First 1000 days of Life’?

- Current research focuses on 2 to 5-year-olds and older children
- We must not neglect to consider the
  - ‘First 1000 days of Life’
  - as a ‘critical time’ to prevent obesity

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**Which of these statements are TRUE concerning ‘complementary feedings’?**

A. Exclusive breastfeeding for 4-months then adding foods such as peanut paste to prevent allergies  
B. Exclusive breastfeeding for 8-months with introduction of rice, fruits, on a weekly basis  
C. Solid foods to the diet, alongside, rather than as a replacement for the milk component  
D. If it occurs before 4-mo, increased risk for obesity
“Overweight?....NOT ME!”

Poll the Audience

- How many agree with the adjectives that describe how these individuals viewed these babies?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree

Poll the Audience

- How many of you agree with these adjectives that individuals would use when speaking with the mother about any of these infants?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree

Infants Born to Overweight/Obese Mothers

Transmission of Obesity-Adiposity from Mother to Baby

- Maternal-Fetal nutrition and Metabolism
- The First 1000-days of life
  - Lower total protein intake
A Baby is Born at Conception and NOT at Delivery

Reducing Risk of Overweight and Obesity in Infancy and Early Childhood

Study Recommendations:

For children under 2-years old
- Focus on diet and responsive feeding
- Lower protein intake for children
- Examine behavioral change theories to use with parents


WHO GROWTH CHARTS

Time for Audience Participation
Growth charts show a decline in the BMI for a 3-year old, followed by an increase at age 4 and 5. What is the meaning of this finding?

A. The child will most likely be average weight by 6-years old  
B. The child was underweight until the age of 3  
C. The child will most likely be overweight or obese by 6-yr old  
D. None of the above: BMIs are not good predictors for infants and young children

**Adiposity Rebound (AR)**

Early childhood 'critical period' for development of obesity

BMI declines after infancy to a minimum at around 6 years

The earlier the age at which this minimum BMI value occurs, the more likely a child will be overweight or obese as an adult

**Adiposity Rebound: Study Conclusions**

• Increased risk for overweight later in life
• Infants with earlier AR gained extra fat, not extra lean tissue
• Early AR is an important risk factor for adult obesity
• Supported by higher BMI values, greater weight, and higher waist girth documented at 26 years old in study participants

**BMI PATTERNS**

A changing pattern of childhood BMI growth during the 20th century: 75 yr of data from the Pils Longitudinal Study

**What are the Practice Implications?**

Infancy Review Feeding Patterns and make Changes

Assess HT/WT/BMI

Review feeding patterns and make changes.
**Overweight and Obesity at Age 2 & Impact of Breastfeeding**

- **Key Implications for Public Health**
- Breastfeeding: Obesity Prevention
- Breastfeeding support – Increased Continuation of BF

**Breastfeeding**

**Informed Decision-Making**

- “The only good is knowledge……”
  – Quote from Socrates
- Help mothers make
- Informed-decisions about breastfeeding

**Nutritional Goals: Supporting the Intellectual Conception of Wisdom**

- Brain growth!
- Breastfeeding…..all infants: Exclusive for first 6-months
- LPI’s: Evidence that supplementation with 22 kcal/oz formula through 48 weeks of gestation provides long-term benefits for brain growth

**Time for Audience Participation**

- All of these statements are true concerning the measurement of chest circumference (CC) in infants and toddlers EXCEPT:
  A. Studies have shown that there is no longer any reason to measure chest circumference in infants and children
  B. Rates of weight gain in the first 3 to 4 months of life is positively correlated with growth in CC
  C. CC Z-scores are positively correlated at 3 to 4 months and 6 to 9 months with the presence of obesity at 3 years old

**Question?**

Do you measure chest circumference in infants and toddlers?

A. Yes
B. No
C. Sometimes
Chest Circumference in Infancy Predicts Obesity in 3-year old Children

Original Article
Chest circumference in infancy predicts obesity in 3-year-old children
Izumi Aihara et al.1, Akiko Katsui2, Isao Hori3, Norikazu Hirose4, Hiromi Hanaba5, Yuka Toya6, Kenta Takakura7, Yoko Amano8, Yumiko Murakami9, Yuki Terahara10, Kenjiro Tanaka11, Tota Yanagawa12, Akihiko Kitashima13, Fumiya Seki14, Akio Yamada15, Akihiko Okada16, and the Japanese Paediatric Society Growth Study Group

What are the Practice Implications?

3 to 4 months and 6 to 9 months
Review Feeding Patterns and make Changes

Think ‘Out of the Box’ Innovative Strategies to Prevent Overweight & Obesity in Infants & Toddlers in Your Clinical Practice

Breastfeeding and Prevention of Obesity

• https://www.cdc.gov/breastfeeding/
  – Guidelines and Recommendations
  – Promotion and Support Strategies
  – Overweight and Obesity
• Breastfeeding Data and Statistics
  – https://www.cdc.gov/breastfeeding/data/index.htm

Breastfeeding and Prevention of Obesity

• United States Breastfeeding Committee
  – Statement on Breastfeeding as a critical strategy for obesity prevention
• Obesity Prevention - United States Breastfeeding Committee
  – http://www.usbreastfeeding.org/d/do/414
**Late Preterm Infant (LPIs)**
*Best Feeding Practices*

**Time for Audience Participation**

All of these are common feeding problems for LPIs in the newborn period EXCEPT:

A. Poor suck and suck bursts  
B. Difficult latch for breastfed babies  
C. Difficulty sustaining negative pressure during feed  
D. More defined sleep pattern is believed to positively correlate with successful breastfeeding  
E. Abnormal movement of tongue

**Common Feeding Problems**

- Poor suck and suck bursts  
- Difficult latch for breastfed babies  
- Difficulty sustaining negative pressure during feed  
- Abnormal movement of tongue  
- Changes in behavioral states  
- Result can be INADEQUATE PO INTRAX

**Breastfeeding LPI's**

- Awaken infant for feedings every 3 hours and offer breast milk at each feeding  
- If the infant effectively latches and sucks, allow the infant 10 to 15 minutes at each breast  
- After each breastfeed, offer bottle of supplemental breast milk until milk supply is established

Breastfeeding LPI’s

- Encourage the mother to pump both breasts for 15-20 minutes after each feed
- Keep a log of feedings
- Take time to review feeding patterns/observe a feeding in the office

Supplements for the Breastfeeding Late Preterm Infant

- **Vitamin D**
  - All breastfed infants should receive 200 IU oral vitamin D drops daily beginning by the first 2 months of life

- **Iron**
  - Oral supplementation of elemental iron at 2mg/kg/day
  - Purpose: Prevent IDA and neurodevelopmental deficits

Time for Audience Participation

- **High Serum Leptin Levels in Infancy**
  - A. Predict obesity in childhood especially in formula fed infants
  - B. Are unreliable diagnostic levels throughout infancy
  - C. Have not been studied in infants
  - D. Indicates early signs of fatty liver

BIOMARKERS & OBESITY

- **Serum Leptin Levels**
- Leptin levels in breastfed vs formula fed infants
- Leptin levels in cord bloods

BIOMARKERS & OBESITY

- Non-invasive ways to obtain leptin levels infants
- Salivary biomarker analysis
- Cheek cell vs capillary blood sampling

What are the Practice/Research Implications?

Should we measure leptin levels?

Review Feeding Patterns and make Changes.

Thank you

• Thank you
• NAPNAP Foundation
• For supporting this session
  • https://www.napnapfoundation.org/home

References

• Hashibe, F. et al. (2014). Infants born to overweight/obese mothers show accelerated growth during the first year of life even when breastfed, and fast growth is known to be an antecedent of later obesity. Ann Nutr Metab 64, (suppl 1): 19-24
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Let’s Search for Answers

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Thank you

• Thank you
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