Hyperinsulinism and Feeding

Sherri Shubin Cohen, MD, MPH
Medical Director, Pediatric Feeding and Swallowing Center
Program Director, Nutrition Fellowship
The Children’s Hospital of Philadelphia
Associate Professor of Clinical Pediatrics
Perelman School of Medicine, University of Pennsylvania
Do children with HI have feeding difficulties?

- 34% of children with congenital hyperinsulinism were identified as having a feeding disorder at diagnosis
- 93% treated for gastroesophageal reflux
- 75% received tube feeding

Banerjee (2016) Frontiers in Endocrinology
Why do children with HI have feeding difficulties?

<table>
<thead>
<tr>
<th>Disease severity</th>
<th>Glucose stability</th>
<th>Medications</th>
</tr>
</thead>
</table>
| • Insulin reduces appetite and feeding through signaling mechanisms in the brain | • Need for frequent meals  
• Stressful mealtimes  
• Tube feeds | • Diazoxide  
• Unpleasant taste  
• Octreotide  
• Gastrointestinal dysmotility |

Banerjee (2016) Frontiers in Endocrinology
Does type of treatment influence development of food aversion?

- 45% had food aversion
- Mode of treatment did not impact likelihood of developing food aversion

Feeding Paradigm

**Medical Disorders**
(Physicians, Nurse Practitioners)
- Endocrinologic
- Gastrointestinal
- Respiratory
- ENT
- Cardiac
- Neurodevelopmental

**Behavioral**
(Psychologists)
- Mealtime structure
- Refusal behaviors
- Parent-child interaction

**Developmental/Mechanical**
(Occupational Therapists, Speech Pathologists)
- Chewing & swallowing
- Posture & positioning
- Sensory defensiveness
- Self-feeding

**Nutrition**
(Dietitians)

**SOCIAL**
(Social Worker)
ABC paradigm

**ABC paradigm**
- **Antecedent**
  - What precedes or triggers the behavior
- **Behavior**
  - What is the behavior of interest
- **Consequence**
  - What happens after the behavior to ultimately change the frequency of the behavior
ABC paradigm

**Antecedent**: what precedes or triggers the behavior
- Factors that can disrupt the typical progression of feeding development
  - Discomfort associated with chronic medical condition
    - Endocrinologic, Gastrointestinal, Respiratory, Cardiac, Neurologic
  - Developmental
    - Delayed feeding skill acquisition
  - Anatomical
    - Unrepaired tracheoesophageal fistula
  - Limited appetite
    - Organic, temperamental, learned
  - Inconsistent mealtime routine
    - Difficult to develop a typical hunger/satiety cycle
  - Inappropriate presentation of food
    - Bite size, texture
ABC paradigm

**Behavior**: what is the target behavior

- Increase the consumption of food
  - Volume
  - Variety
  - Texture
- Decrease disruptive behavior
ABC paradigm

**Consequence**: feeding problem is maintained by environmental factors (inadvertent reinforcement)

- The consequence affects the likelihood of the behavior occurring in the future
  - Negative reinforcement
    - Child behaves inappropriately, parent removes the food, increases the likelihood the behavior will occur in the future
  - Positive reinforcement
    - Child behaves inappropriately, parent provides attention, increases the likelihood the behavior will occur in the future
- Parents have difficulty responding effectively to negative mealtime behavior
- Caregivers focus more on maladaptive eating behavior than appropriate eating behavior
Behavior Shaping

- Change the **antecedent**
  - *Cannot have active physical discomfort for behavioral therapy to be successful*
- Mealtime structure: develop hunger and satiety cycle
  - 3 meals, 2-3 snacks
  - Limit meals to 20-30 minutes
  - Minimize grazing
- Feed in developmentally appropriate supportive seating
- Limit distractions
- Texture progression
  - Gradual transition from baby food to pureed then mashed table foods
  - Avoid stage 3 baby foods
  - Avoid mixing crunchy foods into pureed foods
Behavior Shaping

- Change the consequence
  - Use rewards instead of distractions
  - Alternate bites of preferred and non-preferred foods
  - Repeated introduction of new foods is needed before acceptance is established
  - Consistent approach across all caregivers
Contact information

Sherri Cohen, MD, MPH
cohens@email.chop.edu
Website:
http://www.chop.edu/centers-programs/pediatric-feeding-and-swallowing-center