Feeding Clinic: A Multidisciplinary Approach to Pediatric Feeding Disorders

Brenda Sitzmann, MA, CCC-SLP
Sarah Edwards, DO
Laura Slosky, PhD
Jamie Wilkins, RD, LD, CNSC
Elizabeth Schroeder, OTR/L
Feeding Services at Children’s Mercy
Feeding Services at Children’s Mercy

Interdisciplinary Pediatric Feeding & Swallowing Program

• Multidisciplinary Feeding Clinic at Adele Hall
  • Focus of today’s presentation
  • GI, psychology, nutrition, speech and OT
• Multidisciplinary Feeding Clinic at CMK
  • GI NP, pediatrician, psychology, nutrition, OT
  • Similar to MDFC but no SLP services
Multidisciplinary Feeding Clinic (MDFC)

• Adele Hall Team Members
  • Gastroenterologist: Sarah Edwards, DO
  • Psychology: Laura Slosky, PhD
  • Nutrition: Jamie Wilkins, RD, LD, CNSC & April Escobar, MS, RD, CSP, LD
  • Speech: Brenda Sitzmann, MA, CCC-SLP, CLC
  • OT: Elizabeth Schroeder, MOT, OTR/L & Rebecca Pearson, MOT, OTR/L
  • Social work is available as needed
Patient Population

- Birth to 18 years of age
- Oral feeders or potential to be oral feeders
  - Children with g-tubes who are unable to be oral feeders are followed by g-tube clinic
- Benefit from at least 3 of the 5 disciplines
Feeding Disorders

- Pediatric Feeding Disorders are Common
  - 25% of children
    - 3-10% of children have severe feeding problems
  - 80% in developmentally delayed population
- Feeding difficulties are often multifactorial
  - Combination of medical, psychosocial, nutrition and skills/ability factors

Common Diagnoses/Reason for Referrals

- Oral aversion
- Aspiration
- Extremely selective eaters
- Limited oral intake
- Difficulty gaining weight
- Non-oral feedings
- Behaviors are impacting oral intake
- EoE
- Sensory concerns
- Reflux
- Constipation Vomiting/feeding intolerance
- Using liquids to meet nutritional needs
- Weaning from g-tube feedings
Typical Team Visit

• Family completes a packet before they are scheduled
  • Birth history, medical history, development, current medications, current therapy services, food log
• 1 1/2 to 2 hour visit
• Height and weight
• Caregiver interview with the entire team
• Feeding assessment
  • May use the observation window
Typical Team Visit

• Physical exam
• Team meeting
  • Team leaves the exam room to formulate a plan
• Recommendations
  • Personalized written recommendations/home program “Depart Summary”
Gastroenterology

Sarah Edwards, DO
History

- Illness
- Prematurity
- Development and acquisition of oral motor skills
History

• Medications
• Bowel Habits
• Detailed diet and feeding history
Feeding History

• Choking or Gagging
• Changes in respiration
• Regurgitation or Vomiting

Reflux or Vomiting?

• Is it reflux or vomiting
  – Reflux is the EFFORTLESS return of gastric contents into the esophagus and/or out of the mouth
  – Vomiting is the forceful return of gastric contents out of the mouth, often accompanied by nausea and retching
Feeding History

- Feeding refusal
- Meal duration
- Current Diet, textures
Feeding History

• Stage at which choking/gagging, regurgitation occurs is important
  • Later in feeding: greater correlation with medical issues
Feeding History

• Problems early in feeding:
  • may relate to positioning
  • parent-child interaction
  • oral defensiveness
Feeding History

• Meal duration beyond 30 min
  – Healthy child: behavioral feeding problem
  – Medical disorder: ineffective mechanics

Physical Exam

- Assessment of Growth
- Abdomen for constipation
- Spine for kyphoscoliosis, sacral anomalies
Physical Exam

- Neurologic for tone and level of function
- Oral for gag, swallow, seal, drooling, mucosal problems
Physical Exam

Signs of deficiency or chronic illness

http://en.wikipedia.org/wiki/Nail_clubbing
Assessing Growth

• Account for prematurity
  – Correct until age 2 years
• Adequate growth is the most important goal.
Oral Feeding Reduces Hospitalizations Compared with Gastrostomy Feeding in Infants and Children Who Aspirate

Maireade E. McSweeney, MD, MPH¹, Jessica Kerr, MPH¹, Janine Amirault, BA¹, Paul D. Mitchell, MS², Kara Larson, SLP¹, and Rachel Rosen, MD, MPH¹

Objective To compare the frequency of hospitalization rates between patients with aspiration treated with gastrostomy vs those fed oral thickened liquids.

Study design A retrospective review was performed of patients with an abnormal videofluoroscopic swallow...
### Oral Motor Competency

#### Table II. Comparison of hospitalizations within 1 year of first abnormal swallow study (oral group) or within 1 year of g-tube placement (g-tube group; n = 114)

<table>
<thead>
<tr>
<th></th>
<th>Oral group (n = 49)</th>
<th>G-tube group (n = 65)</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of admissions, median (IQR)</td>
<td>1 (0, 1)</td>
<td>2 (1, 3)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Total number of inpatient d, median (IQR)</td>
<td>2, (1, 4)</td>
<td>24 (6, 52.5)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Type of hospitalization, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal admission</td>
<td>10 (20%)</td>
<td>41 (63%)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Pulmonary admission</td>
<td>16 (33%)</td>
<td>19 (29%)</td>
<td>.69</td>
</tr>
<tr>
<td>Intensive care unit admission</td>
<td>1 (2%)</td>
<td>18 (28%)</td>
<td>.0003</td>
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<tr>
<td>Other admission</td>
<td>13 (27%)</td>
<td>28/65 (43%)</td>
<td>.07</td>
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</tbody>
</table>
Further Investigation

• Labs
• Imaging
• Procedures
Laboratory

• CBC
• Electrolytes
• Vitamin and Mineral levels
• Metabolic
Imaging

- Bone age
- MRI of the head
- Upper GI x-ray
Imaging

- Videofluoroscopic Swallow Study
- Gastric emptying study
Procedures

• pH study with impedance
• Esophagogastroduodenoscopy (EGD)
• Fiberoptic Endoscopic Evaluation of Swallowing (FEES)
The Complexity of Feeding Problems in 700 Infants and Young Children Presenting to a Tertiary Care Institution

††Nathalie Rommel, ‡Anne Marie De Meyer, §Louw Feenstra, and ††Gigi Veereman Wauters

Departments of ††Ear-Nose-Throat, Head and Neck Surgery, and ‡Pediatric Gastroenterology & Nutrition, University Hospitals Leuven, Belgium; ‡Leuven University Center for Informatics and Telematics, LUDHI, University of Leuven, Belgium; §Department of Ear-Nose-Throat, Erasmus Medical Centre, Rotterdam, The Netherlands; ††Pediatric Gastroenterology, Hepatology & Nutrition, Antwerp, Queen Paola Children's Hospital AZ, Middelheim, Belgium

ABSTRACT

Background: Feeding problems are common in infants and young children. A multidisciplinary team approach contributes to better patient care. However, few quantitative data on multidisciplinary feeding assessment of children have been published.

Objectives: The aim of this study was to characterize the etiology of feeding difficulties in 700 children referred for assessment of severe feeding difficulty. The authors differ.

Conditions, particularly gastroesophageal reflux disease. Behavioral problems were more frequently seen in children aged more than 2 years. The results indicate that oral sensory based feeding problems are related to past medical intervention. Children with feeding disorders had a significantly lower birthweight for gestational age. Preterm infants were overrepresented in this population.

Conclusions: A multidisciplinary team approach is essential for assessment and management because continued medical...
Findings

- 86% medical disorder
- 61% oropharyngeal dysfunction
- 18.1% behavioral problem

Conditions occurred both alone and in combination.
### Findings

**TABLE 2. Medical conditions of 603 patients and oral feeding problems of 427 patients**

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<thead>
<tr>
<th>Medical conditions</th>
<th>N</th>
<th>Percent (100x/603 = %)</th>
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<tr>
<td>Isolated gastrointestinal</td>
<td>256</td>
<td>42.45</td>
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<tr>
<td>Neurologic</td>
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<tr>
<td>Genetic</td>
<td>20</td>
<td>3.32</td>
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<td>Cardiologic</td>
<td>17</td>
<td>2.82</td>
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<tr>
<td>ENT— orofacial</td>
<td>20</td>
<td>3.32</td>
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<tr>
<td>Metabolic</td>
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<tr>
<td>Oncologic</td>
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<tr>
<td>Nephrologic</td>
<td>12</td>
<td>1.99</td>
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<tr>
<td>Gastrointestinal-neurologic</td>
<td>37</td>
<td>6.14</td>
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<tr>
<td>Gastrointestinal-genetic</td>
<td>10</td>
<td>1.66</td>
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<tr>
<td>Gastrointestinal-ENT— orofacial</td>
<td>15</td>
<td>2.49</td>
</tr>
<tr>
<td>Gastrointestinal-nephrologic</td>
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<td>1.66</td>
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<tr>
<td>Other combined medical pathologies</td>
<td>&lt;10 patients/group</td>
<td>18.57</td>
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*Table 2 from Children's Mercy Kansas City.*
<table>
<thead>
<tr>
<th>Gastro/Esophageal reflux-esophagitis</th>
<th>Anatomic Site</th>
<th>Histologic/Anatomic Findings</th>
<th>N</th>
<th>% (of 350)</th>
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<td></td>
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<td>Gastro</td>
<td>228</td>
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<td>Pepic</td>
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<td>Duodenal</td>
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<td>Gastric</td>
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<td>H. pylori</td>
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<td></td>
<td></td>
<td>Crohn's disease</td>
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<td></td>
<td></td>
<td>Bacterial overgrowth</td>
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<tr>
<td></td>
<td></td>
<td>Esophageal</td>
<td>23</td>
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<td>Esophageal</td>
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<td>Esophageal</td>
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<td>Anus</td>
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<td>Hernia</td>
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<td>Functional disorder</td>
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<td>Anorexia HFS</td>
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<td>Atresia esophagea</td>
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<td></td>
<td></td>
<td>Pyloric stenosis</td>
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<td></td>
<td></td>
<td>Pseudo-obstruction</td>
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<td></td>
<td>Toddler diarrhea</td>
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<tr>
<td></td>
<td></td>
<td>Obstructive</td>
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<td>Short bowel</td>
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<td>Celiac syndrome</td>
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<td>3.94</td>
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<td>Pancreatic/Liver disease</td>
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<td>Chronic pancreatitis</td>
<td>6</td>
<td>1.77</td>
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<td></td>
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<td>Cystic fibrosis</td>
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<tr>
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<td></td>
<td>Avascular pancreatitis</td>
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<td></td>
<td></td>
<td>Biliary atresia</td>
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<tr>
<td></td>
<td></td>
<td>Budd Chiari</td>
<td>1</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Fishtail esophagus</td>
<td>2</td>
<td>0.52</td>
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<tr>
<td>Others</td>
<td></td>
<td>Eosinophilic esophagitis</td>
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<tr>
<td></td>
<td></td>
<td>Esophageal trauma</td>
<td>1</td>
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</tr>
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</table>
Findings: Medical Conditions

• Prematurity significant risk factor for developing feeding problems
  – Medical feeding problems were related to birth weight for GA but not to GA alone
  – GI pathology related to GA <34 weeks
  – Medical interventions strongly related to GA

Summary

• Multidisciplinary approach
• Thorough history and physical
• Diagnostic testing is sometimes needed
• Many different causes for feeding problems
Psychology

Laura Slosky, PhD
• Approximately ½ to ⅔ of children with feeding disorders present with mixed etiology that includes behavioral, physiological, and developmental factors (Budd, et al., 1992; Rommel, et al., 2003).

• A psychologist is uniquely equipped to evaluate and treat these contributory factors.
The Pediatric Psychologist:

– provides a behavioral perspective on the feeding problem
– assesses for comorbid behavioral or psychiatric conditions impacting the child or the broader family system
– provides referrals as appropriate
– Addressing feeding behavior
Behavioral Perspective

• Missed or delayed stages of feeding development
• Learned avoidance secondary to aversive conditioning
• Frequency and severity of challenging mealtime interactions
• Behavioral refusals that have been inadvertently reinforced by caregivers
• Inappropriate family or cultural expectations for feeding
Comorbidities

• Child:
  – Inattention
  – Hyperactivity
  – Anxiety
  – Developmental Complexities
  – Oppositionality
  – Many others as feeding is a highly heterogeneous population
Comorbidities

• Caregivers:
  – Caregiver stress!
  – Parent mental health

***These all impact caregiver ability to adhere to treatment plans and to follow through with their child on a consistent basis.***
Referrals

• Often need to build basic behavioral skills
  – Hard time getting child to do something that is hard for them when a basic request results in a tantrum!

• Outpatient behavioral therapy

• Psychiatry

• Parent Supports

– This is stressful!
Behavioral Feeding Interventions

• Implementation of mealtime structure!!
• Structured feeding schedule
• Appetite Manipulation
• Behavior Management
  – Differential Attention
  – Reinforcement Strategies
  – Extinction of negative feeding behaviors
  – Consistent Contingency Management
Behavioral Feeding Interventions

• Parent Training
  – Train the parent to become the child’s therapist
  – Changing Parent-Child Interaction Pattern
  – Changing the Feeding Behaviors of both parent and child
  – Consistency!!!
Nutrition

Jamie Wilkins, RD
Nutrition Assessment

- Anthropometrics: Weight, Height/Length, Head Circumference
- Nutrition Focused Physical Exam, MUAC
- Feeding history
- Current intake and tolerance
- Calculate energy, protein and hydration needs
- Evaluate for obvious nutrient deficiencies
What is MUAC?

- Mid-upper arm circumference
- Can be independent assessment of malnutrition
- How to measure
  - Measure the length of the arm from the acromion process of the scapula to the tip of the elbow.
  - Note the midpoint (mark)
  - Measure around the arm at the level of the mark
  - Arm should be at the side, not flexed.
  - Pull firm without compressing the skin
Measuring MUAC
AND/ASPEN Consensus Statement

- In 2014 published diagnostic criteria to identify and classify undernutrition
  - Early identification
  - Uniform screening tools
  - Improved interventions
  - Collection of meaningful data
  - Evidence based analysis of malnutrition and treatment
### Primary indicators when single data point is available

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Mild Malnutrition</th>
<th>Moderate Malnutrition</th>
<th>Severe Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wt/ht z score</td>
<td>-1 to -1.9 z score</td>
<td>-2 to -2.9 z score</td>
<td>-3 or greater z score</td>
</tr>
<tr>
<td>BMI z score</td>
<td>-1 to -1.9 z score</td>
<td>-2 to -2.9 z score</td>
<td>-3 or greater z score</td>
</tr>
<tr>
<td>Length/height z score</td>
<td>No data</td>
<td>No data</td>
<td>-3 z score</td>
</tr>
<tr>
<td>MUAC</td>
<td>Greater or equal to -1 to -1.9 z score</td>
<td>Greater or equal to -2 to -2.9 z score</td>
<td>Greater than or equal to -3 z score</td>
</tr>
</tbody>
</table>

### Primary indicators when 2 or more data points are available

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Mild Malnutrition</th>
<th>Moderate Malnutrition</th>
<th>Severe Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wt gain velocity (&lt;2 yrs)</td>
<td>&lt;75% of the norm for expected weight gain</td>
<td>&lt;50% of the norm for expected weight gain</td>
<td>&lt;25% of the norm for expected weight gain</td>
</tr>
<tr>
<td>Weight loss (2-20 yrs)</td>
<td>5% of usual body weight</td>
<td>7.5% usual body wt</td>
<td>10% of usual body wt</td>
</tr>
<tr>
<td>Deceleration in wt/ln z score</td>
<td>Decline of 1 z score</td>
<td>Decline of 2 z scores</td>
<td>Decline of 3 z scores</td>
</tr>
<tr>
<td>Inadequate nutrient intake</td>
<td>51-75% of estimated energy/protein needs</td>
<td>26-50% estimated energy/protein needs</td>
<td>&lt;25% of estimated energy/protein need</td>
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## Growth Expectations

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Males</th>
<th>Females</th>
<th>Females</th>
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<tbody>
<tr>
<td>* 0-1 Month</td>
<td>36</td>
<td>4.5</td>
<td>30</td>
<td>4.5</td>
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<tr>
<td>*1-2 Months</td>
<td>35</td>
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<td>*2-3 Months</td>
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<td>*3-4 Months</td>
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<td>20</td>
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<td>*4-5 Months</td>
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<td>*5-6 Months</td>
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<td>*6-9 Months</td>
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<td>10</td>
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<td>*9-12 Months</td>
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<td>1.3</td>
<td>8</td>
<td>1.3</td>
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<td>*12-18 Months</td>
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<td>1.1</td>
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<td>*18-24 Months</td>
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<td>2-6 Years</td>
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<td>6-7 Years</td>
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<td>7-8 Years</td>
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<td>8-9 Years</td>
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<td>9-10 Years</td>
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<td>10-11 Years</td>
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<td>0.5</td>
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<td>0.5</td>
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<td>11-12 Years</td>
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<td>0.5</td>
<td>12</td>
<td>0.6</td>
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<tr>
<td>12-13 Years</td>
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<td>0.6</td>
<td>12</td>
<td>0.5</td>
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<td>13-14 Years</td>
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<td>14-15 Years</td>
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<td>15-16 Years</td>
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<td>0.3</td>
<td>5.5</td>
<td>0.1</td>
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<tr>
<td>16-17 Years</td>
<td>9.5</td>
<td>0.2</td>
<td>3</td>
<td>0-0.1</td>
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<tr>
<td>17-18 Years</td>
<td>7</td>
<td>0.1</td>
<td>4</td>
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<tr>
<td>18-19 Years</td>
<td>3</td>
<td>0-0.1</td>
<td>3</td>
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<tr>
<td>19-20 Years</td>
<td>7</td>
<td>0-0.1</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
Speech-Language Pathology

Brenda Sitzmann, MA, CCC-SLP, CLC
Speech-Language Pathology

• Assess for oral and pharyngeal dysphagia
  • Overlap with OT
• Collect history as a team
  • Current and past therapy services
  • Clinical signs of aspiration
  • Preferred and non-preferred foods
• Helpful strategies
Speech-Language Pathology

• Complete feeding assessment
  • Observe a typical feeding with caregivers
    • Ideally with preferred and non-preferred foods
    • Evaluating oral motor feeding skills
    • Assessing for aspiration
  • Trial therapy techniques
Speech-Language Pathology

• Recommendations
  • Work with team members
    • Feeding therapy
    • Home programming
      • Mealtime structure
      • Therapy techniques
Speech-Language Pathology

• Recommendations (continued)
  • Additional evaluations
    • Videofluoroscopic swallow study
    • FEES
  • Nutritional needs
    • Prioritize foods to add
    • Safe for chewable vitamin?
Occupational Therapy

Feeding Skills: Posture & Tone, Sensory-motor, Oral-motor

Elizabeth Schroeder, MOT, OTR/L
Observation prior to feeding

- Motor milestones
  - Are they developmentally appropriate? Why not?
- Tone driven posturing
  - Do they have spasticity or hypotonia negatively effecting self-feeding and posture
  - Asymmetry – torticollis
- Breathing differences
  - Do they have mobility in chest and shoulders for breathing
Posture & Tone

• Fine movements of the jaw and tongue needed for feeding are dependent on…
  – Head control, which is influenced by…
    • Trunk alignment, which depends upon…
      – The stability of the pelvic area.
• All that to say: seating is so important!
Postural Goal

- Neutral pelvis with slight anterior tilt
- Thighs should be parallel and hips bent to 90 degrees
- Knees should be bent to 90 degrees with toes pointing forward
- Feet in contact with surface
- Symmetrical elongated trunk - not leaning
- Symmetry through shoulders - not elevated or rotated
- Placement of tray at nipple height
Sensory Processing

“The ability to take in information from all of the senses, process that information and then produce an adaptive response”

- Jean Ayres
## Sensory Processing

<table>
<thead>
<tr>
<th></th>
<th>Like it</th>
<th>Dislike it</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active</strong></td>
<td>Seeker</td>
<td>Avoider</td>
</tr>
<tr>
<td></td>
<td>- prefer big flavors</td>
<td>- gag/vomit</td>
</tr>
<tr>
<td></td>
<td>- over filling</td>
<td>- push away from table</td>
</tr>
<tr>
<td><strong>Passive</strong></td>
<td>Bystander</td>
<td>Sensor</td>
</tr>
<tr>
<td></td>
<td>- pockets food</td>
<td>- difficult to engage</td>
</tr>
<tr>
<td></td>
<td>- loses food in mouth</td>
<td>- inconsistent preferences</td>
</tr>
</tbody>
</table>
External Sensations

• **Sight**
  – looks away from food; tray is overwhelming

• **Sound**
  – Covers ears; startles to noise; distractible

• **Smell**
  – Covers nose; prefer bland food

• **Touch**
  – Frequent hand wiping; finger splaying
Oral-Sensory

• Texture
  – Gagging, scraping off tongue, predictable pattern

• Taste
  – Grimacing, shuddering

• Proprioception
  – Over filling, looses food in mouth, swallows food whole

• Praxis
  – Difficulty learning oral movements, unpredictable motor skills
References


References


THANK YOU

GI Multidisciplinary Feeding Clinic
(816) 302-8037

* All numbers Fiscal 2016