Treatment of Behavioral Feeding Disorders

Hilda Pressman, MA CCC SLP BCS-S
Board Certified Specialist in Swallowing and Swallowing Disorders
Nutritional Management Associates LLC
www.nutritionalmanagement.org
hpressman@nma.org
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Schedule

- Development of Behavioral Feeding Disorders
- Assessment
- Intervention
Development of Behavioral Feeding Disorders
Behaviors that Involve Swallowing

- Drinking
- Eating
- Saliva control
- Managing the oral hygiene bolus
  - Tooth brushing is critical even in tube fed children
- Taking oral medication
Eating Disorders Categories

- Dysphagia
- “Unsafe” eating behaviors
- Disruptive mealtime
- Anorexia
- Failure to advance developmental skills
- Feeding phobia
- Conditioned dysphagia
Prevalence of Dysphagia in the Pediatric Population

- Typically developing population, estimated at 24-45% (Burklow et al.; Haas and Maune)
- High prevalence in certain conditions e.g. CP 27-40% (Kleinman, 2004)
- Behavioral components in children with feeding/swallowing abnormalities 80% (Burklow et al. 1998)
Reasons for Refusal of PO Feeding

- GI
- Neurological
- Respiratory
- Cardiac
- Safety of swallow
- Medication
- Sensory issues
- Motor disabilities
  - Neuromuscular
  - Apraxia
- Conditioned dysphagia
- Environmental issues
Never assume that a problem is all behavioral until you have ruled out medical issues.
Symptoms of Behavioral Feeding Disorders

- General feeding aversion - total or partial
- Specific food aversion
- Failure to advance skills
- Fear of eating
- Failure to express hunger
- Disruptive mealtime behavior
- Excessive meal duration
- Gagging or vomiting
- Negative vocalizations or verbalizations
- Spitting out food
Symptoms of Behavioral Feeding Problems-2

- Absence of hunger
- Interruptions in meal
- Self-abusive behaviors
- Aggressive behavior
- Leaving the meal
- Food and utensil throwing

- Sensory signs
  - Reduced responsiveness
  - Heightened responsiveness
  - Difficulty with organizing self during eating
  - Reduced attending skills
Development of Behavioral Issues

- 2/3-1/2 of parents of typically developing children report at least one mealtime behavioral problem
- ¼ report multiple mealtime problems
- Parent-child interactions may become negative
- Behavioral problems may develop secondarily or become entrenched
The Autism Spectrum Profile

- The primary feeding disorder in children with autism spectrum is a behavioral feeding disorder
- Delayed development of skills is a consequence of the primary problem
- Co-occurring conditions cause additional feeding and swallowing problems. These must be identified and considered in the management program
General Problems in ASD

- The Primary Problems
  - Social intimacy
  - Routines and rituals
    - Stereotypical behavior
    - Repetitive behaviors
    - Need to preserve sameness
General Problems in ASD-2

• Reduced variety and diversity within behaviors

• Deficient communication
  ◦ Pragmatics
  ◦ Delayed development of comprehension and expression

• Late hand dominance, unusual movements
Characteristics of Feeding and Swallowing Disorders in ASD

- Delayed development of milestone skills
- Splinter skills with gaps in repertoire
- Restricted food preferences
  - Reduced number
  - Reduced variety
  - Reduced type
Characteristics of Feeding and Swallowing Disorders in ASD-2

- Insistence on particular food preparation
- Rigid eating routines
- Specific plates, cups, utensils
- Disruptive mealtime behaviors
- Food cravings (53% v 18%)
- PICA (33% v 3%)
Restricted Food Preferences
(Williams 2004)

- Referred for evaluation: Diet is inadequate for nutrition: Ages 2-10 YO
  - Few foods - Primarily starches and snacks
  - Minimal solid foods
  - Does not sit at table to eat
  - Refuses to self-feed
  - Average number of solid foods in diet 9.9
Food Preferences-ASD (Schreck, KA and Williams, 2005)

“...The children preferred fewer types of food items within groups than their families; however, family food preferences appeared to influence food selection more than the diagnostic characteristics of autism”.
Autism Diets
Gluten and Casein Free

“…intrinsic defects of innate immune responses…suggesting a possible link between GI and behavioral symptoms mediated by innate immune abnormalities”

Ikyonouchi, H et.al 2005
Autism-Leaky Gut Hypothesis

“...increase of abnormal intestinal permeability (IPT) in individuals with autism (36.7%) and their relatives (21.2%) compared with typical subjects (4.8%). Patients with autism on a reported gluten-casein free diet had significant lower IPT values”

- DeMagistris et.al J Pediatr Gastroenterology 2010
“...evidence based recommendations are not yet available...Care providers should be aware that problem behavior...may be the primary or sole symptom of the underlying medical condition, including some GI disorder”.

Buie et.al. Pediatrics 2010
“In autism spectrum disorders, many parents resort to alternative treatments... Among these, the most commonly used is the gluten-free, casein-free diet. The objective of this work was to conduct a systematic review of studies published from 1970 to date related to the gluten-free, casein-free diet in autism spectrum disorder patients...
A Systematic Review-2

- We observed that the evidence on this topic is currently limited and weak. We recommend that it should be only used after the diagnosis of an intolerance or allergy to foods containing the allergens excluded in gluten-free, casein-free diets. Future research should be based on this type of design, but with larger sample sizes”.  

Mari Bauset S et.al. 2014
Assessment
Assessment of Behavioral Issues

History and Interviews

- Family interview
- Classroom interview
  - Eating routines
    - Meals and snacks
    - Routines associated with eating
    - Acoustic and visual environment
    - Foods
- Communication modality/competency for eating
Assessment of Behavioral Issues
Observations - 1

- Typical child behaviors during eating
  - Independence
  - Foods eaten
  - Amount, rate, duration
  - Generalized or task specific aversions
  - Eating skills
  - Symptoms of phobia (fear of eating)
  - Tolerances of familiar adults/familiar surroundings
Assessment Of Behavioral Issues
Observations-2

- Caregiver’s strategies for regulating child’s behavior
  - Antecedents
    - What happens just before behavior
  - Prompts
    - Strategies used to improve behavior
  - Consequences
    - Results
Assessment of Behavioral Issues
Observations-3

- Child’s attention skills (Ssohlberg & Mateer, 1989)
  - Focused attention-responds to specific stimuli
  - Sustained attention-maintains response during repetitive activity
  - Selective attention-maintains set in face of distracting stimuli
  - Alternating attention-shifts focus between tasks
  - Divided attention-responds simultaneously to multiple task demands
The Differential Diagnosis
What is Causing the Problem

- Apraxia
- Neuromuscular impairments
  - Oral hypotonia
  - Reduced breath support
- GERD and other GI disorders
- Sensory disorders
- Traumatically conditioned dysphagia
Apraxia

- Consequences of apraxia
  - Reduced ability for planning, programming and/or coordinating eating tasks and task components
  - Reduced ability for integrating sensory array and producing appropriate motor response
Apraxia-2

- Resultant behaviors
  - Rigid eating habits and routines
  - Messy eating
  - Drooling saliva during eating
  - Delayed development of skills
Neuromuscular Impairment

- Consequences of neuromuscular disorder
  - Reduced strength, stability and/or dexterity in structures involved in one or more of the stages of swallowing
  - Active primitive oral reflexes may interfere with coordinated movement
Neuromuscular impairment -2

- Functional problems
  - Drooling - not activity dependent, stops when eating
  - Characteristic eating problems are consistent across foods
  - Swallowing signs
    - Coughing during or after eating
    - Reduced frequency of saliva swallows
  - Atypical breath and throat sounds while eating
GERD and Other GI Disorders

Consequences

- Discomfort associated with eating
- Vomiting during or after meal if she eats rapidly or eats more than usual
- Gagging and vomiting become conditioned responses to eating and stress
- FTT or marginally normal growth
- Reactive airway disease
- Aggravated by constipation or by illness
GERD and Other GI Disorders Resulting Behaviors

- Food refusal after eating small meals
- Rumination
- Regurgitation/coughing on secretions upon wakening—May be thick
- Night time coughing/fussiness
- Mouthing hands and/or bibs and clothing may be associated with reflux
Eosinophilic Esophagitis EoE

- Chronic allergic inflammatory response of the esophagus
  - May lead to irreversible tissue injury
- Symptoms mimic GERD
- Identified by endoscopy and biopsy
- Esophagus typically void of eosinophils
- Prevalence may be 1-4 in 10,000
- Failure to thrive
Symptoms of EoE

- Food refusal solids or higher textured foods
- Prolonged mealtimes
- Dysphagia-oral and/or esophageal
- Reduced volume
- Reduced variety of intake
- Preference for purees
- Gagging and vomiting
Treatment of EoE

- Proton pump inhibitors
- Inhaled steroids
- Elimination diet
- Elemental diet
  - PO or GT
- Repeat endoscopies to monitor
- Feeding therapy
Causes of Sensory Based Disorders

- Autism
- Interactive disorders
- GI disorders
  - GERD
  - Constipation
- Medications side effects
  - Nausea
  - Diarrhea
  - Taste changes
- Polypharmacy
Causes of Sensory Based Disorders-2

- Feeding phobia
  - Traumatically conditioned dysphagia

- Cognitive and developmental disorders
  - Insufficient early experience
  - Inadequate skills for meeting challenges
  - Inadequate praxis skills

- These children often have normal oral motor skills
Oral Sensory Problems

- Signs of possible oral hypersensitivity
  - Heightened gag reflex
  - Difficulty transitioning to textured foods
  - Sensitivity to touch in and around mouth

- Associated problems
  - Refusal of tooth brushing
  - Mouthing of non food items PICA
Oral Sensory Problems-2

- Signs of possible oral hyposensitivity
  - Food pocketing
  - Reduced awareness of food in oral cavity
  - Increased drooling, poor saliva management

- Associated problems
  - Prolonged mealtimes
Picky Eaters
Autism and Feeding Problems, Strickland E.

- Eats fewer than 30 foods
- Eats a variety of textures
- Have favorite foods that they want every day, then burnout but will return to that food after several weeks
- Accepts new foods on their plate
- Learn to accept new foods after multiple exposures
Problem Feeders

- Eat fewer than 20 foods and ultimately 5-10 foods
- Refused foods with particular texture
- Won’t return to foods previously eaten
- Won’t tolerate a new food on their plate
- Cry and throw tantrums when offered new food
- Are ritualistic about food
Conditioned Dysphagia

- Learned disorder
- Maladaptive habit
- Maintains behavior beyond physiological need
- Avoidance responses-adaptive behaviors
- Automatic Reactivity reinforces response
- Secondary gain fixes the habit
Traumatically Conditioned Dysphagia

- Eating disorder as consequence or co-occurrence of aversive experience
  - Conditioned aversion to eating-phobia
  - Avoiding ongoing discomfort

- Inadequate timely experience with foods and eating activities
  - Reduced overall intake
  - Fear/avoidance of eating
  - Gagging, regurgitation associated with stress
Intervention
Always meet nutritional needs while teaching new skills
Mealtime should be about meeting nutritional needs in a safe and enjoyable manner
Goals and Objectives

- **Activities**
  - Eating
  - Saliva management
  - Oral hygiene
  - Oral medications

- **Characteristics**
  - Behaviors
  - Skills
  - Efficiency
Maintenance of Behaviors and Skills in Children

- If you don’t use it you loose it
- The intake needed to sustain nutrition and hydration increases with age and growth
- Compliance for training and ability to engage in challenging tasks are learned behaviors
- Ability to control saliva is situation specific
Management Model

- Aims of daily management program
  - Promote health and safety
  - Prevent maladaptive behaviors and function
  - Support advancement of skills/compensations
Management Model-2

- Aims of treatment program
  - Underlying competency
  - Skills
  - Behaviors

- Advance skills and compensations
- Advance behaviors and independence
Treatment Approaches

- Oral motor exercises
- Compensatory strategies
  - Positioning
  - Utensils
  - Textures
- Developing new skills
- Behavioral approaches

- The best therapy for swallowing is swallowing
- Use it or loose it
- Use it and improve it
Motor Learning Theory

- Task Specificity
  - How closely the “exercise” approximates the targeted motor performance
- Mass Practice
  - Doing lots of that specific “exercise”
- Plasticity of the sensorimotor mechanism in becoming more efficient at the target motor activity is dependent on these two things
Motor Learning Theory

In speech and swallowing we produce many short-duration, small range movements in rapid succession very quickly so speed and coordination are crucial.

This is why oral motor exercises have been shown to produce little change in speech or swallowing.
Oral Sensorimotor Therapy

- Has efficacy studies
- Oral feeding is one of the major goals
- Multimodal
  - Encourage coordinated timing and sufficient muscle strength for food and liquid to be swallowed safely
- May include direct exercises
  - Always preparatory to swallowing a bolus
Oral Sensorimotor Therapy-2

- **Specificity of Training**
  - Practices the target task
- **Also includes indirect approaches**
  - Alternative environments
  - Reducing distractions
  - Improving ability to focus on task
- **Goal is to transition to eating with peers**
Developing a New Skill

- **Acquisition**
  - Learn a new behavior

- **Fluency**
  - Repeated practice so that the skill becomes more automatic

- **Generalization**
  - Use the skill at mealtime
  - Add new foods without requiring in depth practice
Critical Period for Acquisition of Eating Behaviors

- What are critical periods
- Neural plasticity
  - The ability of the brain to change
- The brain is modified by experience and learning
- When experience during critical periods is insufficient or inappropriate it becomes more difficult for the child to learn the task
Critical Periods in Human Infants

- Independence – early infancy to 2 years old
  - Holding objects and bringing them to mouth with assistance-effect on gag
  - Hand to mouth independence
    - Bottle
    - Finger feeding
    - Utensil use
  - Regulating rate of eating
  - Alternating tasks within activity
  - Generalization to environments and eating partners
Advancing Skills During the Critical Period

- During the critical period learning is easier. It requires
  - Less structure of the learning environment,
  - Less feedback and reinforcement
  - Fewer trials.
- Foundation competencies needed to support these new skills develop naturally as part of practice within the developmental sequence
Advancing Skills *After* the Critical Period

If a child has failed to develop skills within age expectation, *the skills must be taught*. This is an educational process that involves practice in task sequences that advance skill, are graded for difficulty and individualized for each person. This practice is the exercise for improving the foundation competencies needed for performing the skill.
Prerequisites for Learning Swallowing and Eating Skills

- Ability to tolerate (accept) the practice opportunity
  - Physiology -- age, neuromotor ability
  - Psychology -- compliance, acceptance of challenge, motivation
- Appropriate postural alignments
- Appropriate task conditions—foods, utensils, table setting, environment
- Sufficient practice opportunity
Motor Learning Theory  
James L. Coyle Ph.D.

- **Task Specificity**
  - How closely the “exercise” approximates the targeted motor performance

- **Mass Practice**
  - Doing lots of that specific “exercise”

- **Plasticity of the sensorimotor mechanism**
  - Is becoming more efficient at the target motor activity is dependent on these two things
In speech and swallowing we produce many short-duration, small range movements in rapid succession very quickly so speed and coordination are crucial.

This is why oral motor exercises have been shown to produce little change in speech or swallowing.
Goals and Objectives of Treatment

- Eliminating behaviors that interfere with eating
- Gaining predictable acceptance of eating activity
- Training eating skills and encouraging independence
- Habituating and generalizing eating skills
Behavioral Treatments; Increasing Desired Behaviors (after Babbit et.al. 1994)

- Positive reinforcement
- Feedback
  - Did I do OK?
  - How long before I am finished
- Modeling
- Gradual behavior modification
Interactive Strategies - Communication

- Orient to task with verbal and/or sign cues
- Maintain calm state with verbal support
- Provide signal system for child
- Respond to communicative signals
- Encourage choices at start of meal and during meal as appropriate
Behavioral Treatments
Structure for the Treatment Session

- The trainer
- Training at snack or mealtime
- Planning a facilitating environment
- Selecting foods
- Planning food presentation

- Use developmental hierarchies as a guide
- Structure practice to be as close to target as possible
- Grading the level of difficulty
- Practice frequency
Stages of Treatment

- Tolerance of task-compliance in practice
- Emergence of skill-Inconsistent patterns of performance
- Habituation of skill-consistent performance in select environment
- Generalization of skill-consistent performance with variety of mediators, environments and task demands
**Intervention**

- **Setting**
  - Avoid areas with distractions

- **Timing**
  - Alert, hungry
  - Tube feeding should be bolus

- Do not compromise nutritional intake
Strategies of Advancing Skills

- Create success
  - Begin at easiest step
  - Repeat until fluency is achieved
- Increase one variable at a time
- If difficulties occur return to previous level and assess
Strategies for Advancing Skills-2

- Use feedback to enhance learning and task persistence
- Develop consistent baseline behaviors before trying to advance program
  - Use individual preferences
  - Consider cultural differences in food choices
Strategies for Advancing Skills - 3

- Select the appropriate reward
  - It must be given for an appropriate period of time
- Be prepared for regression
  - Monday morning
  - Return from vacation
Reinforcements

- **Positive**
  - Access to preferred toy
  - Initially reinforce any positive behavior
  - Pair with verbal praise
  - Gradually increase difficulty

- **Negative**
  - Remove toy and attention (no eye contact) for specific time period after negative behavior occurs (20 seconds)
    - Refusal
    - Expulsion
    - Disruptive behavior
Ignoring

- Some disruptive behaviors are maintained by adult attention
- Ignoring behaviors may result in reduction of behaviors
  - Initial increase may occur
Strategies for Advancing/Maintaining Skills

- Snack time practice
- Reduce complexity of task and environmental stresses
- Use developmental hierarchies as a guide
- Structure practice to be as close to target as possible
Advancing food Viscosity and Texture

- Change one variable at a time
  - Color
  - Taste
  - Bolus size
  - Viscosity
  - Graininess
    - Smooth ⇒ Grainy ⇒ mashed ⇒ single pieces ⇒ multiple pieces
  - Crispness and hardness
    - Crisp-soft ⇒ soft ⇒ firm (crisp or moist) ⇒ fibrous

- Develop adequate base of skill for swallowing before advancing texture and viscosity
Advancing Food Viscosity and Texture

- Develop adequate base of skill before advancing texture and viscosity
- Integrating tolerance of taste with tolerance of texture and viscosity
- Change one variable at a time
  - Color
  - Taste
  - Bolus size
  - Viscosity
Strategies for Advancing/Maintaining skills-2

- Advance in step-wise sequence
  - Change one variable at a time
- Use feedback to enhance learning and task persistence
- Develop consistent base line behaviors before trying to advance program
  - Use individual preferences

Sheppard 1995
Strategies for Advancing/Maintaining Skills-3

- Grade the difficulty and duration of the task
  - Select a task that is marginally difficult
  - Select number of trials that is tolerable
  - Vary demands for good and bad days
  - Return to previous level if necessary

- Habituate and generalize to target contexts
  - Select the appropriate reward
Pre-feeding Care

- Give notice of approaching mealtime
- Improve state/affect
  - Music
  - Brushing
  - Massage
- Avoid fatigue during meal
- Positioning
  - Reposition at beginning of meal as needed
Managing Feeding Refusal: An Embedded Hierarchy (Sheppard, McKirdy & Pay 1997)

- Step 1 Compliance Training
- Step 2 Meeting Challenges
- Step 3 Eating readiness
- Step 4 Introduction of food
- Step 5 Generalization
General Rules for Compliance and Meeting Challenges

- Sitting first
- Following adult guidance in non-challenging tasks
- Following adult guidance in easy challenges
- The contract system
- Feedback on amount of task to do and adequacy of performance
Training Objectives
Using Developmental Hierarchies

- Alerting and attending to task
- Orienting for food
- Reception skills
- Swallowing capability for bolus size and viscosity
Training Objectives Using Developmental Hierarchies-2

- Oral Management
  - Bolus texture
  - Viscosity
  - Size
- Chewing
- Cup and straw
- Self-feeding
Improving Stamina

- Increase practice opportunity
- Set duration targets for persistence
- Assist and enhance caloric density for adequate nutrition
- Be prepared for regression
Training Chewing Beyond the Critical Period

- Develop tolerance for mashed textures and table food tastes
- Begin training with single or bitten off crisp easy to chew pieces
- Advance to soft pieces then to firm pieces and finally to mixed consistency
Training Chewing Beyond the Critical Period-2

- Place on molars on preferred or best chewing side
- Advance to placing at middle of mouth and then to using spoon/fork
• Use open cup with rim cut away or v shaped translucent cup
• Use thicker liquid for ease of drinking
• If child is independent place 1 sip in cup
• If child is dependent dispense sip and withdraw cup for swallowing
Training Drinking from Open Cup
Beyond the Critical Period-2

- Advance to holding cup in mouth for swallow and withdrawing cup for breathing
- Advance to more liquid in cup
  - Thinner liquid
  - Sequential sips
Training Drinking from Straw Beyond the Critical Period

- Squeeze liquid to top of straw or use blocked straw technique
- Shape lip closure on straw
- Shape sipping
- Tip liquid up into short straw-juice box
- Alternate blocked straw and tipped liquid as needed
Drooling

- Parotid, Submandibular and sublingual salivary glands
- Seen in 10% of children and adults with CP
  - Children with CP attending special schools as high as 33% severe drooling
- Direct relationship between drooling and increased gross motor disability as well as head control
Drooling

- Lingual, sublingual and parotid glands
- Seen in children and adults with CP 10%
- Children with CP attending special schools as high as 33%
- Direct relationship between drooling and increased gross motor disability as well as head control
Intervention for Drooling

- Improvement not expected beyond age 7
- Anticholongergics
  - Scopolamine used for travel sickness
  - Robinul used for reducing secretions
- Common side effects
  - Dry mouth
  - Decreased sweating
  - Difficulty urinating
  - Blurred vision
  - Loss of taste
  - Headaches
  - Nervousness
Intervention for Drooling-2

- **Bo Tox**
  - Children with most severe CP had increased difficulties
  - Clinical affects last 3-6 months then repeat
  - Children may need anesthesia
  - Radiation

- **Main side effects**
  - Botox can migrate causing respiratory problems
  - Dysphagia
  - Weak mastication
  - Dental caries
  - Parotid gland infection
Therapeutic intervention for Drooling

- Drop retrieval
- Awareness of drooling
- Feeding/oral stimulation program
- Behavior modification program
  - Auditory signal used as a cue to prompt swallowing
- Wrist bands
The Tube Fed Child

Bring child into the kitchen
Acclimate to smells of food
Participate in family meal time
Put food in front of child when family is eating
Encourage mouthing of multiple textures of toys
Brush teeth
Issues When Child is Tube Fed

- NGT up to 3 months
- GT often placed in NICU prior to discharge
  - Failure to thrive
  - Not responsive to intervention
  - Recurrent respiratory problems not able to be managed therapeutically
  - Acute reversible illness
Modifying Tube Feedings
Moving Towards Oral Feeding

- Continuous feed
- Bolus feeding
- Introduction of oral feeding
- Timing of oral feeding
- Introducing trials of food gradually
- Coordination with Pediatric GI re decreasing formula while increasing oral feeding