EBP for Pediatric Feeding Disorders

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Course Objectives

01	Describe the World Health Organization International Classification of Functioning, Disability, and Health definition of Pediatric Feeding Disorders (PFD)
02	Identify how to assess each of the four domains that contribute to the diagnosis of PFD
03	Describe evidence-based interventions that can be used in clinical practice to specifically address PFD
04	Apply the specific interventions to case presentations using professional reasoning to consider the client context(s)

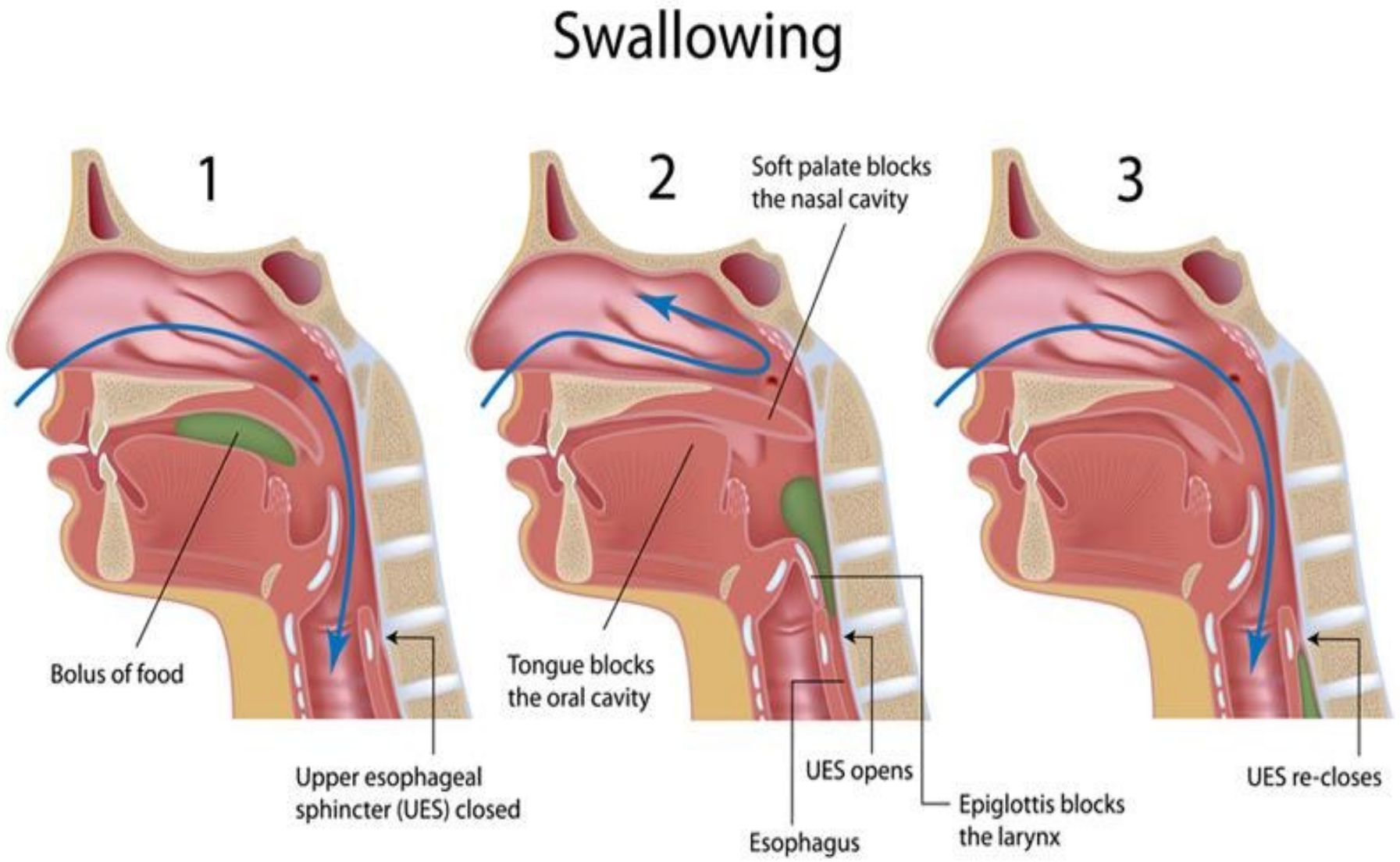
Synopsis:

Pediatric feeding disorders can arise from several factors including motor, sensory, and emotional issues. Developmental trajectories of feeding behaviors will be reviewed, and specific evidence-based interventions described to address these issues using case illustrations.

Review of 4 basic phases of the eating/swallowing process

- Oral Preparatory Phase
- Oral Phase
- Pharyngeal Phase
- Esophageal Phase

Swallowing – Oral, Pharyngeal & Esophageal Phases



Review of Normal Swallow

- Oral preparatory phase
  - This phase is under voluntary control and requires task recognition, head and neck control, intact tongue, jaw and lip control.
  - The length of time for the oral preparatory phase varies depending on the consistency of the food
  - These actions are sometimes included as part of the oral phase
  - The duration of the oral preparatory phase varies depending on the resistive quality of the food and strength of chewing needed

Review of Normal Swallow

- Oral phase
  - During this phase the bolus of food or liquid is propelled to the pharynx by the tongue
  - The tongue creates a trough to control the bolus with the intrinsic tongue muscles
  - The tongue then elevates and flattens against the hard palate using a front to back motion to propel the bolus posteriorly
  - Requires: Intact labial musculature, intact lingual movement, intact buccal musculature, normal palatal musculature, and the ability to breathe comfortably through the nose
  - Typically, respiration stops as the food moves posteriorly
  - The soft palate begins to flare and elevate
  - This phase is under voluntary control and typically lasts approximately 1 second

Review of Normal Swallow

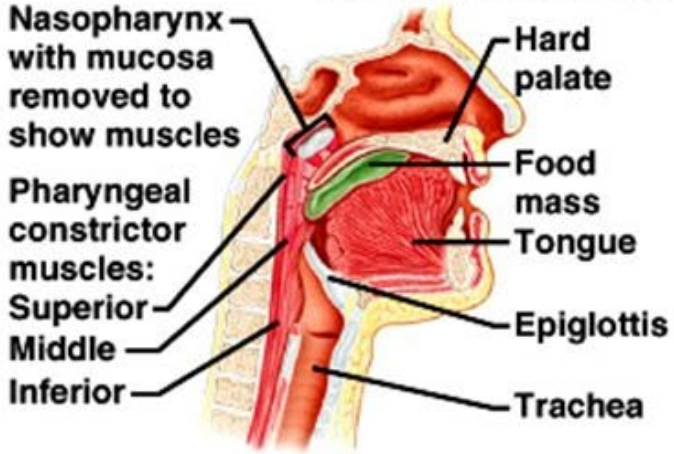
- Pharyngeal phase
  - Swallow response occurs when bolus passes through faucial arches and the middle of the tongue base.
  - Respiration does not occur during this phase
  - Physiological activities:
    - Velopharyngeal closure (nasopharynx) to avoid nasal regurgitation
    - Elevation and closure of the larynx to avoid aspiration
    - Progressive top to bottom peristaltic action of the pharyngeal wall
    - Relaxation of the cricopharyngeal sphincter
  - This is the phase where the “reflexive swallow” is initiated; this is considered the involuntary phase of the swallow
  - Ramping of the base of the tongue followed by tongue base retraction
  - This phase lasts approximately 1 second

Review of Normal Swallow

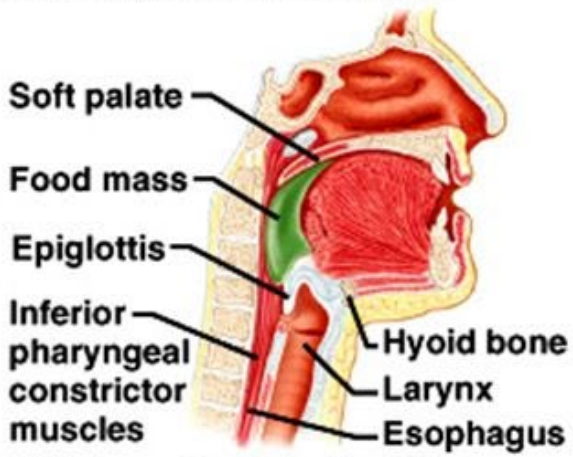
- Esophageal phase
  - This phase is also involuntary during the process of swallowing
  - Peristaltic action propels the food through the esophagus to the stomach
  - At the onset of this phase the upper esophageal sphincter relaxes to allow food to pass into the esophagus
  - At the end of this phase the lower esophageal sphincter opens to allow food to pass into the stomach
  - The length of time varies depending on the viscosity of the food but typically is completed within 20 seconds

Swallowing Mechanism

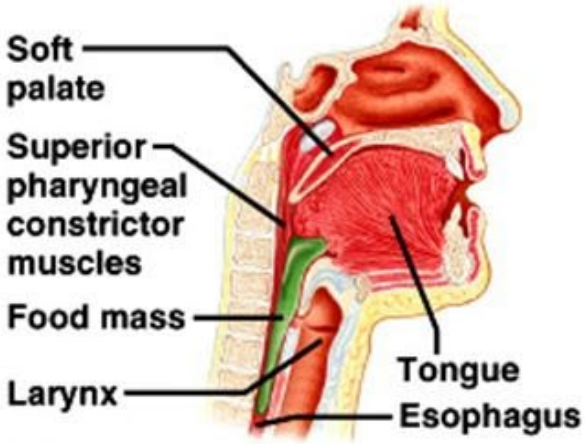
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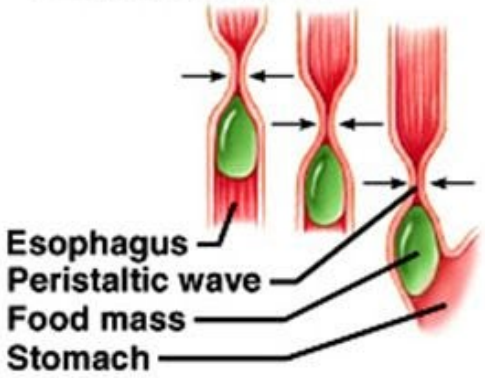
(a) The tongue forces food into the pharynx.



(b) The soft palate, hyoid bone, and larynx are raised, the tongue is pressed against the palate, the epiglottis closes, and the inferior constrictor muscles relax so that the esophagus opens.



(c) Superior constrictor muscles contract and force food into the esophagus.



(d) Peristaltic waves move food through the esophagus to the stomach.

OTPF-4 and the terms *Feeding* and *Eating & Swallowing*

American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process (4th ed.). American Journal of Occupational Therapy, 74(Suppl. 2), 7412410010. https://doi.org/10.5014/ajot.2020.74S2001

Feeding: Setting up, arranging, and bringing food or fluid from the vessel to the mouth (includes self-feeding and feeding others)

Eating & Swallowing: Keeping and manipulating food or fluid in the mouth, swallowing it (i.e., moving it from the mouth to the stomach)

WHO and the Definition of PFD

- Note: The term “feeding” for Pediatric Feeding Disorder (PFD), as defined by WHO includes the actions of Feeding, Eating & Swallowing as defined by the OTPF-4

Definition of Pediatric Feeding Disorder

- Using the framework of the World Health Organization *International Classification of Functioning, Disability, and Health*, a unifying diagnostic term was proposed by Goday et al, 2019 as:
  - "Pediatric Feeding Disorder" (PFD), defined as impaired oral intake that is not age-appropriate, and is associated with medical, nutritional, feeding skill, and/or psychosocial dysfunction.
- Why was there a need uniform definition?
  - Previously, the typical approach to define feeding disorders used the lens of a single professional discipline and failed to characterize associated functional limitations that are critical to plan appropriate interventions and improve quality of life.

Definition and diagnostic criteria for PFD Goday et al, 2019

A disturbance in oral intake of nutrients, inappropriate for age, lasting ≥ 2 weeks, and associated with one or more of the following and;

Absence of the cognitive processes consistent with eating disorders and pattern of oral intake is not due to a lack of food or congruent with cultural norms.

Medical dysfunction

- Cardiorespiratory compromise during oral feeding;
- Aspiration or recurrent aspiration pneumonitis.

Nutritional dysfunction

- Malnutrition;
- Specific nutrient deficiency or significantly restricted intake of nutrients from decreased dietary diversity;
- Reliance on enteral feeds or oral supplements to sustain nutrition and/or hydration.

Definition and diagnostic criteria for PFD Goday et al, 2019 cont.

Feeding skill dysfunction

Need for texture modification of liquid or food;
Use of modified feeding position or equipment;
Use of modified feeding strategies

-

Psychosocial dysfunction,

Active or passive avoidance behaviors by child when feeding or being fed;
Inappropriate caregiver management of child's feeding and/or nutrition needs;
Disruption of social functioning within a feeding context;
Disruption of caregiver–child relationship associated with feeding

Diagnosis of PFD further explained

Daley et al., 2025

Clinical features include restricted dietary choices, feeding or swallowing difficulties, inadequate nutrient intake, aversive feeding responses, and disruptive mealtime behaviors.

These issues can result in growth faltering, malnutrition, or dependence on enteral nutrition.

Diagnosis requires impaired oral intake that occurs daily for at least 2 weeks, which helps eliminate transient feeding problems caused by acute illness.

The PFD diagnosis should only be used when body image disturbances are ***absent***, helping to differentiate them from eating disorders such as anorexia nervosa.

Four closely related, complementary domains seen in PDF

Daley et al., 2025

Medical

Often include congenital or acquired conditions that interfere with appetite regulation, swallowing, energy balance, or respiratory coordination during feeding

Nutritional

Child's intake fails to meet their metabolic demands, resulting in nutrient deficiencies or impaired growth

Feeding Skill

Deficits in the motor skills necessary to safely and effectively consume age-appropriate foods and liquids

Psychosocial Dysfunction

Psychosocial contributors often coexist with medical or skill-based impairments and can significantly affect mealtime dynamics, feeding behaviors, and caregiver-child interactions

Medical Factors

Daley et al., 2025

- Gastrointestinal: Gastroesophageal reflux disease (GERD), delayed gastric emptying, eosinophilic esophagitis, duodenitis, celiac disease, and motility disorders such as aganglionosis (Hirschsprung disease) and congenital segmental intestinal dilatation.
- Neurological: Cerebral palsy with associated choking and gagging during feeding, seizures, stroke, and neuromuscular disorders.
- Cardiorespiratory: Congenital heart defects, bronchopulmonary dysplasia, cystic fibrosis, and other chronic lung diseases.
- Structural/anatomical: Cleft lip and palate, laryngomalacia, esophageal atresia, and choanal atresia.
- Genetic/syndromic: Down syndrome and other trisomies, Pierre Robin sequence, and CHARGE syndrome that involve facial dysmorphisms.
- Prematurity: Feeding tube dependence, ineffective sucking ability, and increased caloric requirements due to chronic illness.

Nutritional Factors

Daley et al., 2025

- Food allergies or intolerances: These include cow's milk protein allergy, other food allergies, and lactose intolerance.
- Restricted diets: This occurs due to sensory or texture sensitivities, autism spectrum disorder, cultural dietary practices, and extreme food insecurity.
- Feeding regimens: This involves overly restrictive volumes or the use of inappropriate or diluted formulas.
- Malabsorption syndromes: These include celiac disease and cystic fibrosis.

Feeding Skill-Based Factors

Daley et al., 2025

- Oral-motor dysfunction: Poor suck-swallow-breathe coordination and weak oral musculature that occurs with muscular dystrophies, myopathies, prematurity, congenital structural abnormalities such as cleft palate, cerebral palsy, and brain injuries.
- Dysphagia: This results from neurological or anatomical abnormalities.
- Delayed development due to environmental influences: Limited exposure to varied textures, prolonged bottle use, and delayed introduction of solid foods.
- Structural/anatomical: Micrognathia, high-arched palate, or other structural abnormalities that impair the ability to hold utensils effectively, food placement, or swallowing.
- Transition difficulties: Refusal to progress from pureed to solid foods despite age-appropriate readiness.

Psychosocial Diagnoses and Factors

Daley et al., 2025

- Avoidant/restrictive food intake disorder (or ARFID): This is characterized by restrictive eating that causes significant nutritional, weight, or psychosocial consequences without body image disturbance.
- Autism spectrum disorder: This condition frequently involves extreme food selectivity, resistance to new textures or tastes, and challenges with the social aspects of eating, leading to impaired oral intake.
- Caregiver stress or mental health disorders: This includes postpartum depression and anxiety.
- Child behavioral concerns: This includes oppositional behavior, sensory aversions, and temper tantrums during mealtimes.
- Trauma or negative feeding experiences: This includes prior choking episodes or a history of being force-fed.
- Attachment difficulties: This is often related to foster care or adoption settings.
- Environmental factors: This includes inconsistent routines and limited access to food or nurturing.

Epidemiology – How big is this problem?



Daley et al., 2025

- PFDs affect a significant number of children in the US, with prevalence estimates varying based on the population studied and the diagnostic criteria applied.
- Research suggests that 5% to 20% of children may show signs and symptoms of feeding disorders.
- A nationwide study in the US reported that among children aged 5 or younger, the prevalence of PFD was approximately 32 to 34 per 1000 child-years in publicly insured populations and 21 per 1000 child-years in privately insured cohorts.

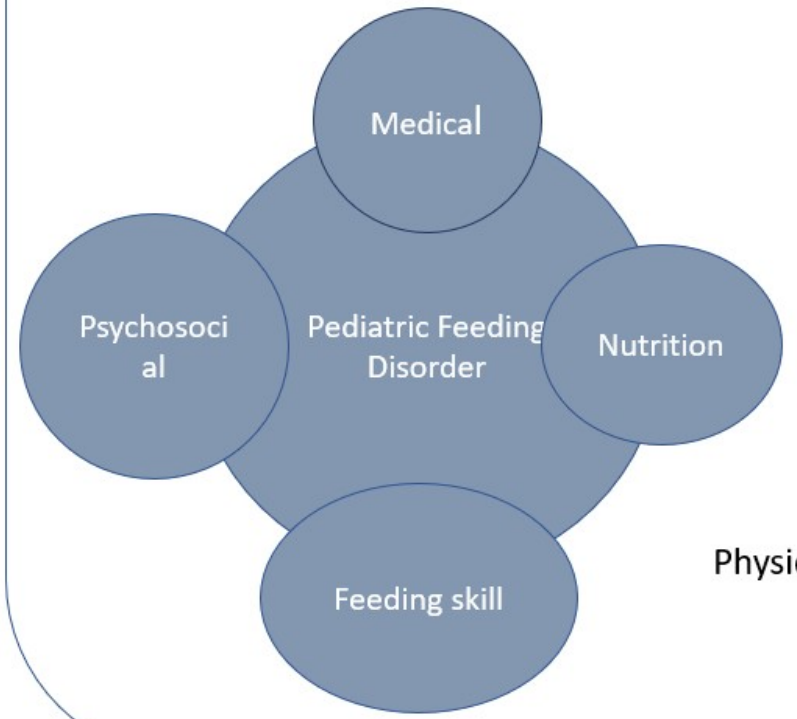
Which children are at risk for PFD?

- Children born preterm or with low birth weight are at increased risk for feeding difficulties
- Children with developmental disabilities—up to 80%of whom experience feeding problems. The severity of these disorders often correlates with the degree of intellectual disability
- Children with chronic medical conditions, such as gastrointestinal disorders or neurological impairments, also have increased rates of PFDs, as do those from lower socioeconomic backgrounds

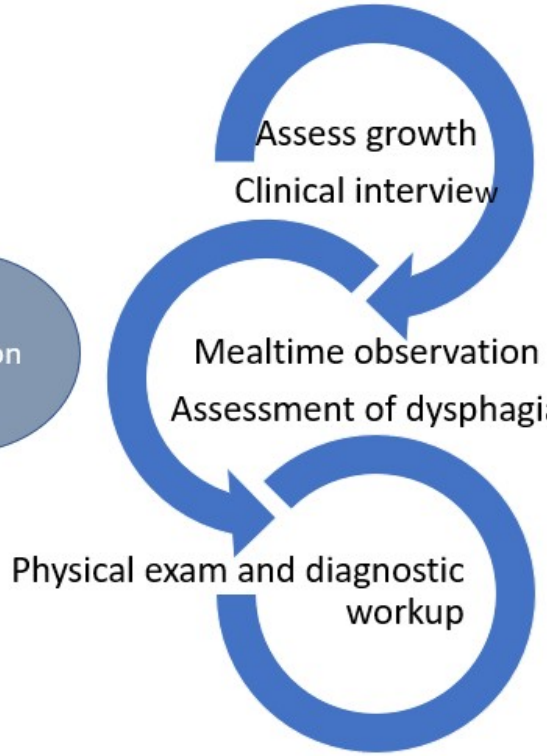
Daley et al., 2025

Evaluation and Management of Pediatric Feeding Disorder

Diagnostic criteria



Evaluation



Management

- Interdisciplinary management for complex patients
- Consider interventions for dysphagia
- Behavioral feeding therapy
- Nutritional support for malnutrition

Evaluation of PFD

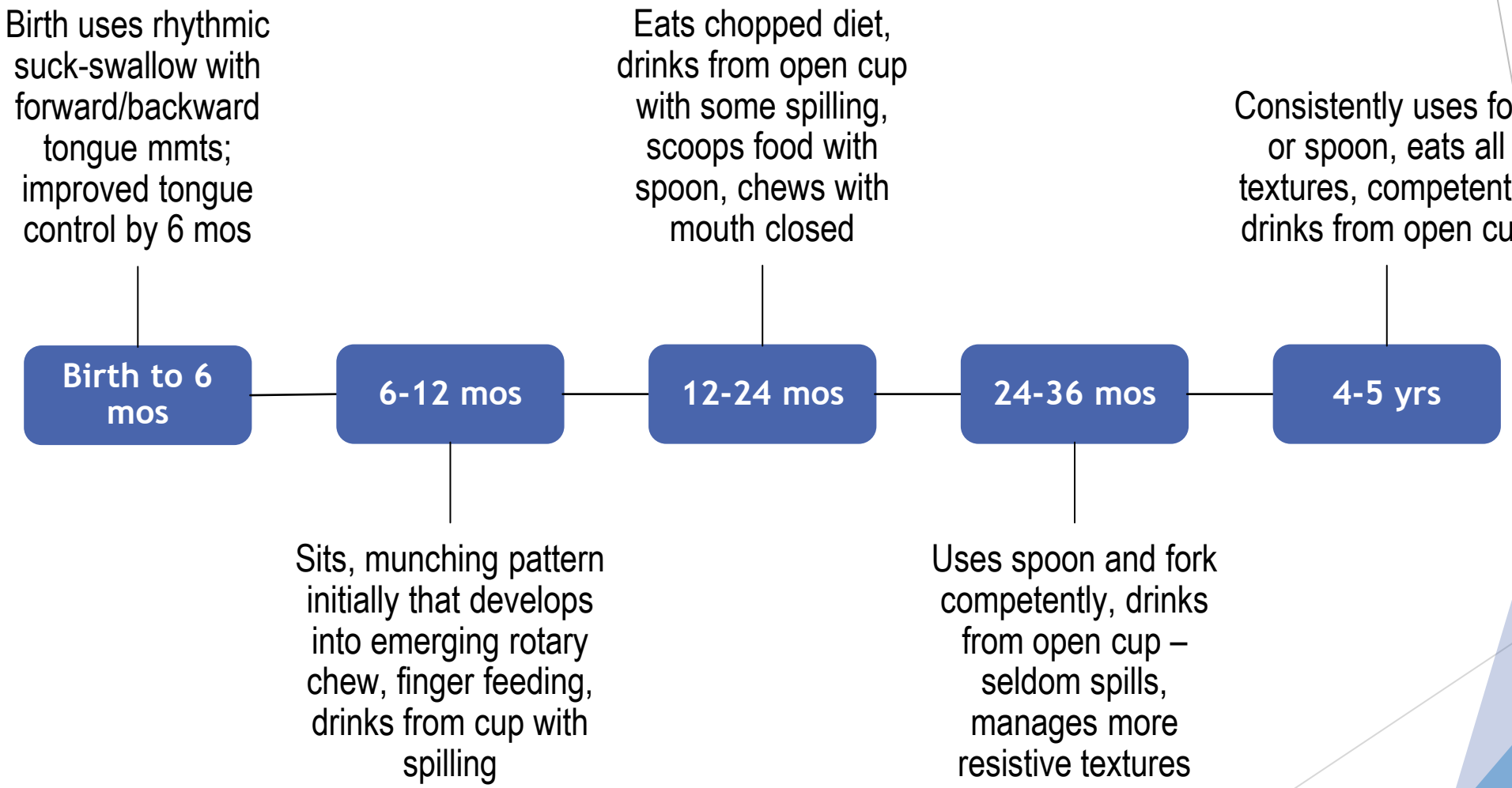
Daley et al., 2025

- Modified barium swallow study (MBSS) or a videofluoroscopic swallow study (VFSS) is used primarily to assess for obstruction, aspiration, or dysphagia.
- Esophageal manometry helps differentiate primary from secondary causes of esophageal dysphagia.
- Endoscopic procedures evaluate the pharynx and larynx during the swallowing of food.
- Food allergy testing helps determine the presence of food allergies.
- Head computed tomography (CT) is used when a stroke is suspected as the underlying cause.
- Laboratory studies assess nutritional status and detect possible deficiencies or anemia.

Developmental trajectory of feeding skills seen from infancy through 5 years old

Developmental eating/feeding skills

From NHS Foundation Trust



Safer eating when sitting upright

Better fine motor skills

Better control of tongue, lips and jaw

Supports self feeding skills

Enhances eye contact and communicative intent



Benefits of sitting upright during mealtime

From NHS Foundation Trust

Development of Oral Sensory Skills

Rogers & Arvedson, 2005

- Effective eating and swallowing is dependent upon adequate oral sensory input in the oral cavity, pharynx, and esophagus
- These sensory systems develop in utero through the myelination of various cranial nerves and the brainstem
- The oral sensory systems are closely tied to oral motor skills

Oral sensorimotor development

Rogers & Arvedson, 2005

- Widespread cortical regions are active with the sensory experiences of eating
- This sensory input supports the coordinated function of safely eating and swallowing food and fluid
- A central pattern generator, a neural network, is myelinated in full-term infants (38-44 weeks gestational age) and allows rhythmic coordination of suck-swallow-breathe
- The medulla has peak synaptogenesis around 34-36 weeks gestational age and provides the basic sensorimotor system to allow safe oral feeds for the preterm infant
- Myelination continues in the paracentral posterior frontal region (2-14 mos of age)
- This myelination patterns occur at a time in which more voluntary aspects of feeding appear, including the appearance of more variable patterns of sucking and swallowing (1 month), the development of a mature suck and the appearance of lip closure on a spoon (8 months), and chewing (9 –10 months)

Developmental Patterns of Rhythmic Suck and Swallow in Premature Infants

Postmenstrual age	32-33 weeks	33 weeks	>34 weeks
Sucking Reflex	Rapid, low amplitude	Irregular	1 suck/second
Suck/swallow Reflex	Not coordinated	Not coordinated	Suck/swallow/ breathe pattern emerging & coordinated

Infant Oral Reflexes at Term

Reflex	Stimulus	Response by Infant	Age of Disappearance
Gag	Touch posterior tongue or pharynx	Contraction of palate and pharynx	Persists
Phasic Bite	Pressure on gums	Rhythmic closing and opening of jaw	9-12 mos
Tongue Protrusion Lateral	Touch to tongue or lips	Tongue protrudes Lateral tongue motions	4-6 mos 6-9 mos
Rooting	Touch corner of mouth	Turn head toward touch	3-6 mos

Case Presentation

- OT services initiated at 10 months for developmental motor issues and support to transition to pureed foods. Child “A” was only on bottle feeds; had gagging and choking issues with purees
- “A” also had medical issues and had ongoing services; sensory profile results indicated oral sensory issues; dx. PFD
- Family had one older child and ate breakfast and dinner meals together
- “A” would often become very distressed during family mealtimes even though he was not being forced to eat
- Parent’s goals included developmental motor skills and transition to age-appropriate foods

Small group activity: How do you intervene?

- Medical
- Nutritional
- Feeding Skills
- Psychosocial

Medical Issues: Addressed at a regional hospital but need to consider medications and impact on hunger/satiety

Nutritional Concerns: Variety of diet and volume; full nutrition via formula but consider future diet for “A”

Feeding Skills: Needs to develop oral motor and oral sensory skills to support full diet

Psychosocial Concerns: Address “A’s” distressed response to family mealtime

Evidence-Based Practice

Evidence-based interventions that can be used in clinical practice to specifically address PFD

Oral Motor Facilitation Technique

Min et al., 2022

- Used with children with PFD and CP
- Quasi-experimental, repeated measures design, using the Oral Motor Assessment Scale (OMAS) with 21 children, 3-10 years old
- Intervention provided for each child individually;16 sessions over 16 weeks using the procedure outlined as the Oral Motor Facilitation Technique (OMFT)
  - (1) warming up technique: postural control of the face and neck, nasal breathing facilitation, sensory adaptation, and awareness;
  - (2) key point technique: oral structure facilitation and chewing; and
  - (3) application technique: real food control

Oral Motor Facilitation Technique

Min et al., 2022

Technique	Classification	Contents
Warming up	2 Categories 12 Techniques	Postural control, Neck facilitation; Sensory adaptation, Breathing Control; Oral preparation
Key Point	7 categories 30 techniques	Direct facilitation on oral structures(face, cheek, gum, tongue and jaw); Chewing
Application	1 category 8 techniques	Direct approach for acceptation and swallowing food Real food control

Outcome of the use of OMFT

Min et al., 2022

- Outcome: All clients had significant gains in all items on the OMAS
- Between 8 and 16 weeks, mouth closure, straw suction, and total score improved significantly
- The treatment effect was evaluated based on the difference in the average score between baseline and 16 weeks; mouth closure was the highest, followed by straw sucking and mastication
- Application to practice:
  - Use of “warm-up” activities to improve postural control are critical
  - Targeted intervention to foster improved oral motor skills is essential
  - Applying these skills to eating actual foods provides authentic use of skills

Comments from Caregivers

Min et al., 2022

I’ve never experienced comprehensive oral motor therapy like OMFT. Especially, I didn’t know that postural control and sensory adaptation was a part of oral motor therapy.

My son started breathing through his nose. And, he tried to control food in his mouth after direct oral structure facilitation by an occupational therapist.

My goal was straw drinking. After I understood the developmental status of my daughter, I changed the goal of my daughter’s feeding according to her current ability.

My family could eat out. Before participating in OMFT, I should carry extra food for my kids. After OMFT, My son could eat chopped pork BBQ in the restaurant.

Case Presentation

- “K” was referred for OT in-home Early Intervention services at age 29 months. OT was ordered for 1x/week - “feeding and rigidity for trying new foods”.
- “K” did not have a medical diagnosis, but was receiving EI services(EI and Speech) for the past year due to mild developmental delays and speech delays.
- “K” lived with his mom, grandmother, aunt and uncle and grown cousins. Mom was a stay-at-home mom, although she did work before “K” was born.
- “K” was a healthy, very social and outgoing little boy. He is very smart and had an extensive vocabulary. But…mealtimes were a “challenge” to say the least
- Mom’s main concerns were “K”s feeding issues and selective eating habits. She was very fearful that he was not getting adequate nutrition

Case Presentation

"K" ate at the kitchen counter. Fed by Mom. Family members did not eat meals at the same time.

Eating Environment/Cultural Factors

Preferred foods- chocolate milk, Danimals's yogurt pouches, Trader Joe's egg rolls (deep fried), McDonald's sausage patties, toaster waffles, pumpkin seeds

Food was not a motivator for "K"

Hmmmm…..

Small Group Activity

Form a small group of 2-3

Identify where you would start your intervention services and why

- Medical
- Nutritional
- Feeding Skills
- Psychosocial Supports

Modification to Volume, Rate and Placement of Food

- Variations in sensory
  - Offering ice straws or cold fluids between solids
- Pacing
  - Speed of presentation
  - Hunger/satiety paradigm
- Placement
  - Position of food within oral cavity
  - Food on the back of the bowl of the spoon
  - Food on a NUK toothbrush or on an infadent



Infadent for oral stimulation and exercises







Oral and gum cleaner that can also be used for oral stimulation and exercises

Interventions – Side Placement of Food (Ibanez et al, 2021; Rubio et al 2015; Taylor, 2020)

- The “flipped spoon” intervention has been used to diminish food refusals and packing of food in the lateral sulci by children
- Side placement of food on the lateral surface of the tongue and molars using a Nuk toothbrush or the back of the spoon was more effective to decrease food expulsions and refusals compared to the “flipped spoon” method
- Many children with feeding refusals also have oral motor difficulties in controlling the bolus during the oral and pharyngeal phases

Interventions

- Use of Cheek and Jaw support
  - Support provided by placing fingers on either side of the infant's cheeks
  - Provide slight pressure inward and towards the corners of the lips
  - Bottle/nipple presented in midline
  - Technique improved oral intake for pre-term infants
- Hwang et al, 2010

Interventions



Facilitation of masseter and pterygoids

- Gloved hand
- Index and middle finger
- Squeeze fingers laterally together
- Provide slight shaking as you withdraw finders from the side of the cheek



Aspiration	Intervention Approaches
Aspiration before the swallow	Posture & positioning techniques Tactile – thermal stimulation - cold Dietary alterations Carbonated liquids
Aspiration during the swallow - reduced protection of the airway	Chin tuck Chin tuck against resistance Mendelsohn Maneuver Dietary alterations & carbonated liquids Mealtime routines with clearing sips of water interspersed with solids Posture & positioning techniques
Aspiration after the swallow – residue in pharyngeal	Effortful swallow Double swallow Mendelsohn Maneuver Masako Maneuver

Intervention for PFD – Role of OTP

Medical Issues

Nutritional Concerns

Feeding Skills

Psychosocial Factors

OTP Intervention for PFD

Medical Issues	Nutritional Concerns	Feeding Skills	Psychosocial Dysfunction
Positioning to avoid aspiration	Coordination with dietician regarding food items and nutritional needs	Use of oral motor & oral sensory facilitation techniques	Systematic approximations to foster family mealtime
Alternating textures to promote clearing swallow	Timing and rate of NG/G feeds to foster hunger/satiety	Systematic desensitization with textures & flavors	Coaching model to help caregiver with feeding
Support diaphragmatic breathing		Self-feeding skills	Support to entire family

Clinical Assessment and Intervention Phases of Swallow – Small Group

- Identify a client (dx) who would have problems with the oral phase of the swallow
- Identify intervention methods that could be used to foster improved oral skills
- Interventions for Oral Phase
  - Sensory issues to detect the position of the bolus in the oral cavity
  - Motor control of the tongue to propel the bolus to the back of the oral cavity
  - Physiological issues related to respiration support

Clinical Assessment and Intervention Phases of Swallow – Small Group

- Identify a client (dx) who would have problems with the pharyngeal phase of the swallow
- Identify intervention methods that could be used to foster improved pharyngeal skills
- Interventions for Pharyngeal Phase
  - Sensory issues to detect the position of the bolus in the posterior region of the oral cavity
  - Motor control of the pharyngeal muscles to begin the peristaltic action
  - Physiological issues related to respiration support during the pharyngeal phase

Additional Evidence for OT in PFD

The OT considers the sensory properties of foods and can make recommendations regarding which food textures may be too difficult for the child. Collaboration among the OTP, family and nutritionist may be important to discuss the need for high-fiber foods with a more homogenous texture. Children with ASD may also have to follow a specific diet that their family chooses because of ethical or religious reasons.

Beaudry-Bellefeuille et al., 2021

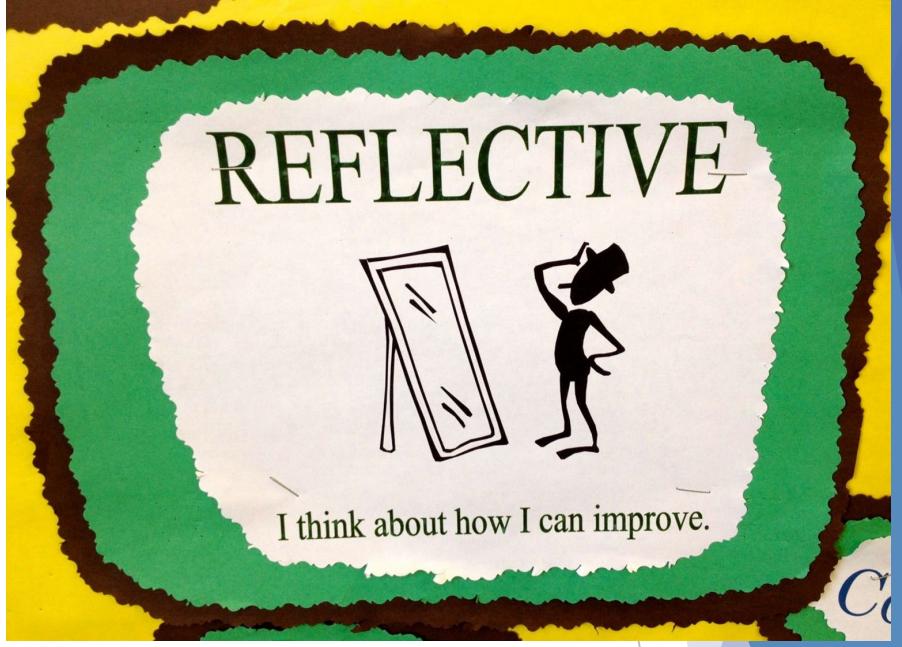
OTP and Psychology

Vincent et al., 2023

- ***Many children with developmental disabilities experience feeding challenges, including food refusal and food selectivity.***

Feeding concerns are often multifaceted and, therefore, an interdisciplinary approach to treatment is needed. A pilot of an interdisciplinary outpatient feeding program was conducted in a hospital medical center by psychologists and occupational therapists. The pilot program focused on caregiver training and improvements in targeted feeding goals in both the clinic and home settings. Treatment outcomes from this pilot program found increases in bite acceptance, decreases in inappropriate mealtime behaviors, increases in caregiver-reported number of foods consumed, and mastery of most individualized feeding goals for children who participated in the treatment program. Additionally, caregivers reported decreased concerns related to feeding and increased confidence in addressing their child's feeding concerns after participation in the treatment. Caregivers also reported high levels of satisfaction with this pilot program and reported the intervention to be feasible.

Reflective Practice: What is it and why do it?

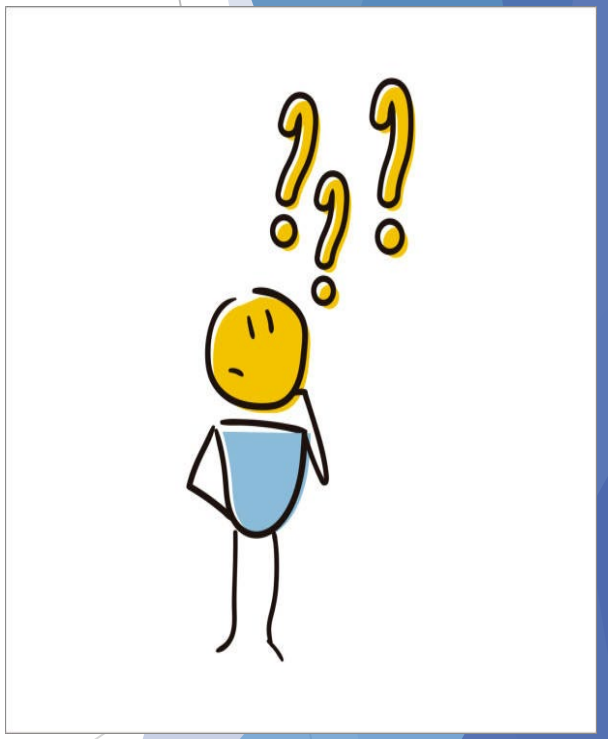


Steps to reflective practice:

1. Received knowledge + experiential knowledge - practice - reflection = professional competence
2. Process of self-observation of your actions in the moment and self-evaluation of did your actions support/help the client
3. Assessing what you do, thinking about WHY you do what you do in a specific situation, and evaluating the outcomes
4. Deciding on next steps to continually improve your practice.

Reflective Practice: Individual Exercise

- Reflect on your practice setting
- What children have “stumped” you regarding the progression of feeding skills? How have you addressed this issue?
- How could looking at the multiple factors of PFD (medical, nutritional, feeding skills and psychosocial difficulties) provide a new vantage point in your practice?
- Identify one systematic step you can make to improve your practice?



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THANK YOU!
Questions?

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