Pediatric Feeding Disorder

A Case-based Exploration of PFD Identification and Management in Primary Care

DATE: Oct. 14, 2022 PRESENTED BY: Amber C Wright, MSN, RN, CPNP-PC, PMHS

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Learning Objectives

- Identify diagnostic criteria for Pediatric Feeding Disorder (PFD);
- Differentiate between potential causes and apply individualized management strategies for PFD.

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It is estimated that annually more than 2.3 million children under age 5 years are affected, and prevalence of parent-reported feeding difficulties range from 25% to up to 80% among children with developmental disabilities.[1]

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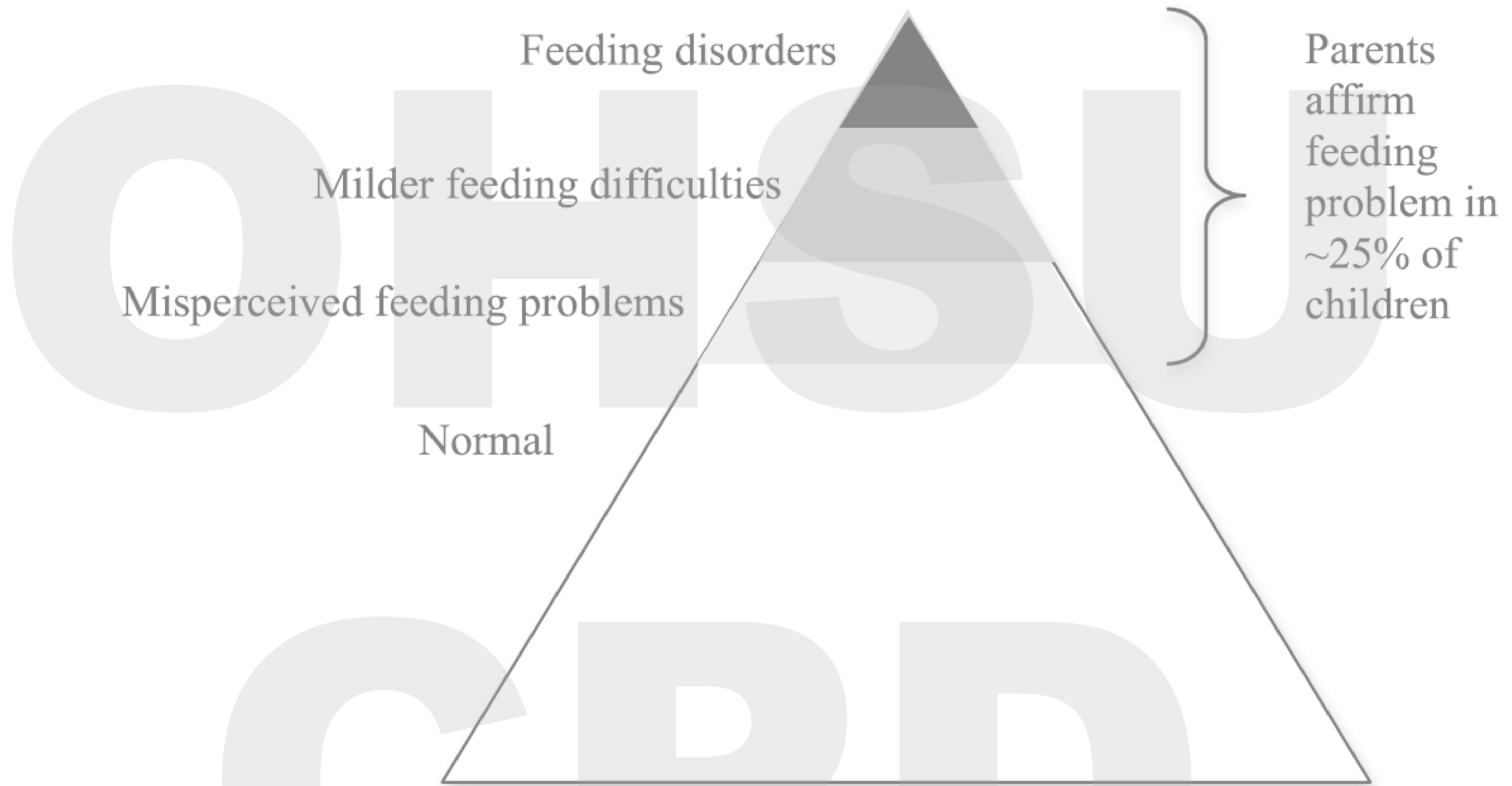

FIGURE 1
Pyramidal representation of young children's feeding behaviors.

Kerzner et al, 2015[2]

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Picky Eater	Problem Feeder
Decreased range/variety; >/= 30 foods	Restricted range/variety; < 20 foods
Food jags; re-gain foods after break	Foods lost are not re-acquired
Tolerates new foods on plate (reluctant but can touch/taste new food)	Cries/falls apart when presented new food; complete refusal
Eats at least 1 food from most texture/nutrition groups	Refuses entire categories of texture/nutrition groups
Frequently eats different foods than rest of family, but eats with everyone else	Almost always eats different foods than rest of family, and often not with family
Will add new foods to repertoire with repeated exposures	Takes more intensive supports/introductions to add new foods
Sometimes reported as "picky eater" by parents	Persistently reported as "picky eater" across multiple visits

Adapted from Toomey, 2010[3]

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Feeding issues and Autism

- Up to 90% of autistic children have feeding problems[2]
- Often resistant to treatment
- Best managed with multidisciplinary approach including hunger inducement, nutritional supplementation, and sensory integration/ABA approaches.[4]

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Feeding problems are stressful!

- Less affection/physical closeness[5]
- Less unintentional touch, engaged in less play
  - Higher need for control, forceful touch[6]
- Increased parental anxiety[7]
- Lower self-efficacy, feelings of rejection, increased self-doubt in parental capabilities, increased stress[8]
- Parental stress correlates with negative behaviors by child during feeding[9]

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Potential short- and long- term effects[1]

- Cognitive impairment
- Emotional dysfunction
- Malnutrition
- Growth retardation
- Reduced energy
- Heightened susceptibility to illness
- Risk factors for future eating disorders (i.e., bulimia, anorexia nervosa)
- Death

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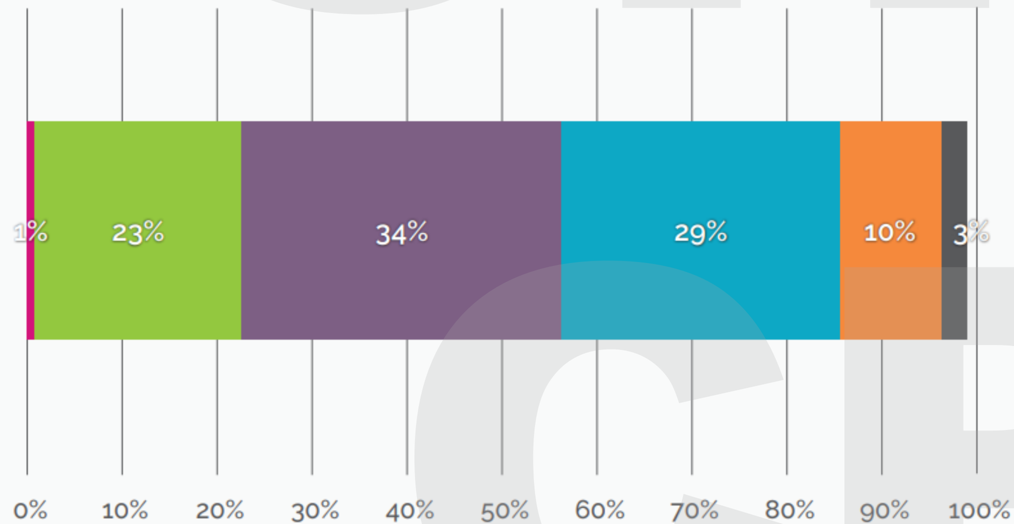
Financial burden



MONTHLY COSTS (AVERAGE)	
Medical Costs	$353
Supplies	$170
Child Care	$153
Convenience Food	$200
Treating Personal Stress	$189
Psychological Care	$134
In-Town Travel	193 miles/month
Time	83 hours/month
ANNUAL COSTS (AVERAGE)	
Out-of-Town Travel	$2,822
Education	$8,575
LIFETIME COSTS (AVERAGE)	
Total Lost Income	$125,645

Feeding Matters, 2019[10]

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"Pediatric Feeding Disorder (PFD) is defined as *impaired oral intake that is not age-appropriate, and is associated with medical, nutritional, feeding skill, and/or psychosocial dysfunction.*"

—Goday et al., 2019[11]

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Diagnostic criteria

- "Age appropriate" is chronological age **not** developmental age
- Classified into acute (< 3 months) or chronic (>/= 3 months)
  - Requires impaired oral intake daily for at least 2 weeks

- ICD-10 code = R63.31/R63.32 (as of 10/1/2021)

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Medical Factors
Nutritional Factors
PFD
Feeding Skill Factors
Psychosocial Factors

Medical Factors

- Impaired structure/function of the GI, cardiorespiratory, neurological systems
  - Structural anomalies
  - GI diseases
  - Chronic lung or congenital heart defects
  - Neurological impairments
  - Disorder of appetite signaling mechanism

Feeding Skill Factors

- Oral sensory functioning impairments – includes under or over-responsiveness to characteristics of food/liquids
- Oral motor functioning impairments

- Skill-based dysfunction
  - Unsafe
  - Delayed
  - Inefficient

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Psychosocial Factors

- Developmental factors
  - Mismatch between abilities and expectations
- Mental and behavioral health problems
  - In child
  - In parent/caregiver

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Psychosocial Factors

- Social influences
  - Parenting strategies
  - Cultural context
  - Misinterpretation of cues
- Environmental factors
  - Distractions
  - Asleep or alone
  - Replacement with highly preferred foods
  - Inconsistent routine
  - Food insecurity

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Nutritional Factors

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

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Thomas

- Prenatal diagnosis of Trisomy 21
- Born 38 4/7 weeks via Cesarean d/t concerns about growth and breech presentation
- B.W. 2,830 g (6 lbs 3 oz)
- NICU course x 8 days = C-Pap, supplemental O2, d/x with cleft mitral valve, small ASD, thrombocytopenia.

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Initial evaluation at age 5 weeks

- Gaining weight well (41 g / day x 3 weeks)
- Coughing/choking during let down, but does better drinking from Dr. Brown's preemie nipple
- "Dry heaving" spells several times daily
- Doesn't seem comfortable while lying flat
- Mild nasal congestion
- Feeding observation notable for difficulty organizing himself to nurse with nipple shield, noisy sucking, cough/choke x 1; improved when mom able to adjust position with Boppy pillow. One wet burp and slight arching backward noted at end of feeding.

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Esophageal issues[1]

- Coughing / Choking
- Vomiting / excessive spit up
- Gagging
- Delayed swallowing
- Multiple swallows
- Drooling
- Difficulty handling oral secretions
- Frequent respiratory infections

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GI disorder – causes gagging, choking, emesis

Food refusals to avoid negative consequences

Parents try to coax, threaten, force feed

Caregiver persistence strengthens child’s avoidance behaviors

Adapted from Ramasamy & Perman, 2000[1]

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TABLE III. Comparison of EE and GERD

Characteristic features	EE	GERD
Clinical		
Prevalence of atopy	Very high	Normal (possibly increased)
Prevalence of food sensitization	Very high	Normal (possibly increased)
Sex preference	Male	None
Abdominal pain and vomiting	Common	Common
Food impaction	Common	Uncommon
Investigative findings		
pH probe	Typically normal	Abnormal
Endoscopic furrowing	Very common	Occasional
Histopathology		
Involvement of proximal esophagus	Yes	No
Involvement of distal esophagus	Yes	Yes
Epithelial hyperplasia	Severely increased	Increased
Eosinophil levels in mucosa	>24/hpf	0-7/hpf
Treatment		
H2-blockers	Sometimes helpful	Helpful
Proton pump inhibitors	Sometimes helpful	Helpful
Glucocorticoids	Helpful	Not helpful
Specific food antigen elimination	Sometimes helpful	Not helpful*
Elemental diet	Helpful	Not helpful*

*Unless co-occurring food allergy exists.

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Rothenberg, 2004[14]

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Reflux management[15]

- For infants:
  - Reduce volume / increase frequency
  - Consider thickening bottle feedings
  - If breastfeeding, 2-4 week trial of maternal exclusion diet
  - Keep upright for minimum of 30 minutes after feedings
  - Avoid seated position in car seat / infant carrier
- For older children:
  - Avoid spicy and high-fat/fried foods, carbonated beverages and caffeine
  - Avoid excessive activity immediately following meals
  - Avoid eating 2-3 hours before bedtime
  - Avoid tight-fitting clothes

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Medication Management[15]

- Consider trial of proton-pump inhibitor (works by suppresses gastric acid secretion by specific inhibition of the hydrogen–potassium –ATP enzyme system):
  - Omeprazole –
    - 2.5 mg QD for 3-5 kg; 5 mg QD 5-10 kg; 10 mg QD 10-20 kg all for up to 6 weeks
    - 20 mg QD for >/+ 20 kg for up to 4 weeks

- If PPI's are contraindicated or not available, may consider trial of H2 receptor antagonist (works by primarily inhibiting both the concentration and volume of gastric secretion):
  - Famotidine –
    - 0.5 mg/kg QD for age < 3 months;
    - 1 mg/kg/day divided BID for ages 3 months to 16 years for up to 8 weeks.
    - 20 mg BID for > 40 kg

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Red Flags for EoE[16]

- Chronic vomiting
- Food refusals / learned avoidant behaviors
- Prolonged chewing without swallowing
- Extensive use of “dips” and/or dipping foods in water
- Foods getting stuck / impactions
- Combination of eczema, asthma, and GERD

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Eosinophilic Esophagitis[16, 17]

- Diagnosis confirmed via EGD with biopsies
- Management:
  - Swallowed topical steroids
  - Elimination diets and/or amino acid-based formulas
    - Strongly recommend referral to RD!
  - If advanced/causing strictures, may require endoscopic dilation

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Follow-up at 3 months

- Was started on H2 blocker by PCP (helped decrease gagging, but spit up persisting)
- Increased coughing/choking
- Continuing with good weight gain/growth
- Noted to have delayed fine motor and language and borderline adaptive/cognitive and gross motor skills.

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Laryngeal issues[12]

- Coughing
- Choking
- Stridor
- Dysphagia
- Hoarseness
- Weak or muffled cry
- Cyanosis
- Respiratory distress
- Recurrent chest infection

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Laryngeal malformations[12]

- Gold standard for diagnosis is rigid bronchoscopy plus esophagoscopy
- Other testing may include flexible airway endoscopy, endoscopic evaluation of swallowing, and modified barium swallow

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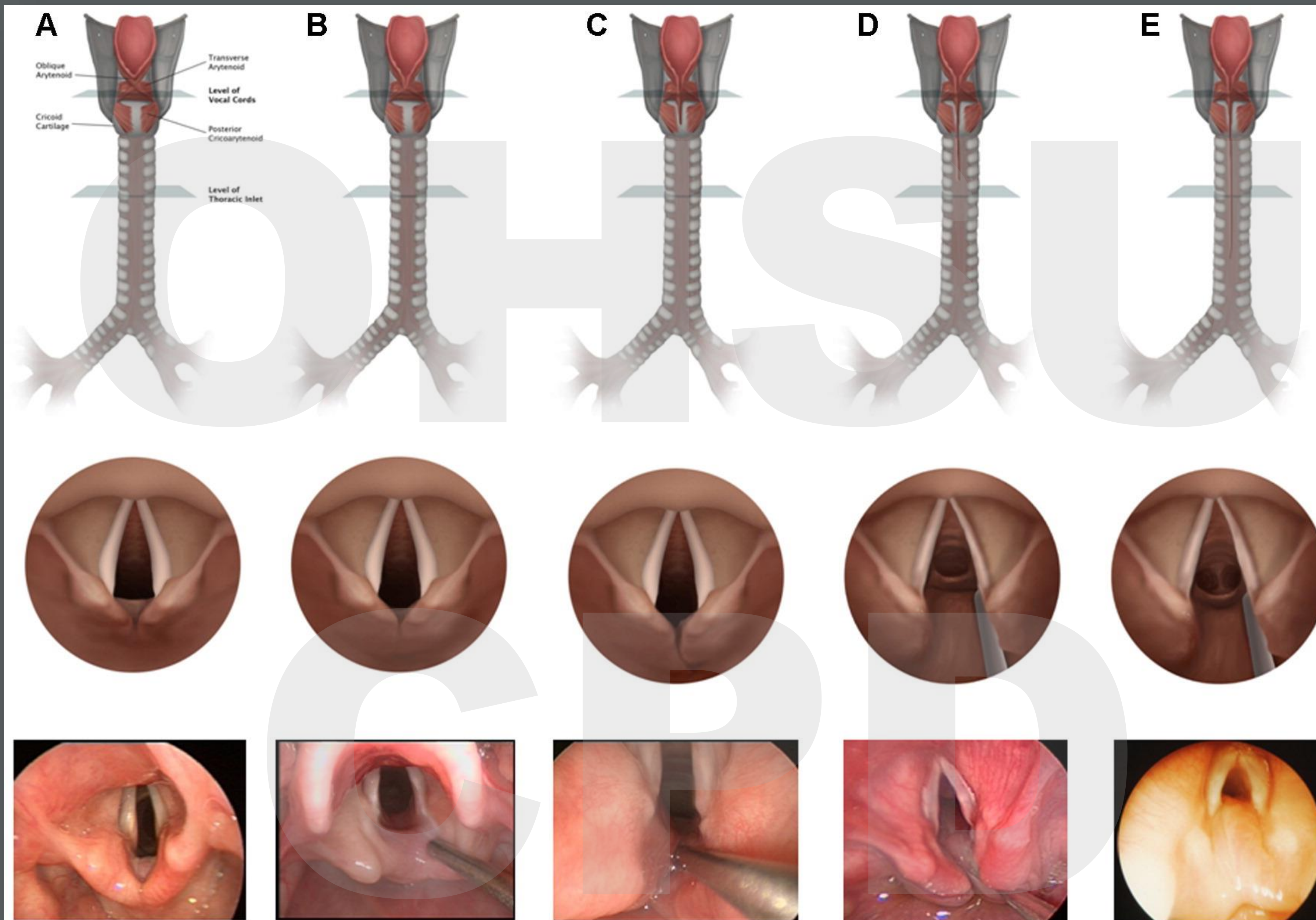

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Johnston et al, 2014[13]

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Laryngeal cleft

- Surgical cleft repair is definitive treatment[13]
  - Endoscopic may be considered for minor cleft
  - Open repair for larger clefts

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Follow-up at 26 months

- Evaluated by Aerodigestive Clinic and underwent injection laryngoplasty (at age 10 months) and subsequent laryngeal cleft repair (at age 23 months)
- MBSS notable for one mild airway penetration without aspiration with thin liquids; no other pharyngeal dysmotility noted but delayed oral-motor skills

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Skill-based dysfunction

- Unsafe = choking, aspiration, apnea/bradycardia, gagging, vomiting, fatigue, refusal
- **Delayed = requires food to be modified from it's original form that is not age-appropriate; use of special feeding equipment/positioning/strategies**.
- Inefficient = prolonged mealtime duration (> 30 min.) or inadequate oral intake.

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Follow-up at 31 months

- Continues working on transitioning to more age-appropriate textures, but now weaned off thickened fluids and bottle.
- Poor weight gain over the past several months.
- Current issues with throwing “everything” (even preferred foods, utensils) and will overstuff and may gag, so parents are often feeding him themselves at meals.
- Provided 3 meals per day in high chair, but also grazing/snacking between meals.
- He seems to “eat better” when in front of a screen (TV/tablet).

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Parenting styles r/t feeding[2]

- Controlling
- Indulgent
- Neglectful
- Responsive

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Screening Questions for Parents

- How anxious are you about your child's eating?
- How would you describe what happens during mealtime?
- What do you do when your child won't eat?

Kerzner et al, 2015[2]

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Satter's Division of Responsibility[18]

- **Parents** are responsible for:
  - Controlling what food comes into the house.
  - Making and presenting meals.
  - Insisting that children show up for meals.
  - Making mealtimes pleasant.
  - Teaching children to behave at the table.
  - Regulating timing and content - no running with food, no food 2 hours before next mealtime.

- **Your child** is responsible for:
  - How much s/he eats.
  - Whether s/he eats.
  - How her/his body turns out.

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General Recommendations[2]

- Avoid distractions during mealtimes
- Maintain pleasant neutral attitude throughout meal
- Feed to encourage appetite
- Serve age-appropriate foods
- Systematically introduce new foods
- Encourage self-feeding

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Food insecurity:

Inadequate access to food for an active, healthy life due to limited money and resources.[20]

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OHSU Epic SmartPhrases

- Hunger Vital Signs = .1foodinsecurity
- Food resources (Oregon/National) = .1foodresources

Credit: Shaina Balayan (OHSU CON DNP graduate – 2021)[20]

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Follow-up at 34 months

- Was on brief trial of cyproheptadine and parents have adjusted meal/snack schedule to limit grazing.
- Now growing well!
- Meal routine now includes Thomas at the table with family, screens off, selective ignoring of disruptive behaviors, pacing, and shared control of self-feeding.
- Still sometimes picky and will overstuff if not paced, but continues working closely with feeding therapist and demonstrating slow gains with feeding skills.

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Screening Tools

- PediEAT (+NeoEAT bottle / NeoEAT breast)[21]
  - https://www.feedingflock.com/tools
- STEP-CHILD[22]
  - https://www.medicalhomeportal.org/resources/tools-for-the-practice

6-QUESTION SUBSET

Question	Answers		
Does your baby/child let you know when he is hungry?	YES	NO	
Do you think your baby/child eats enough?	YES	NO	
How many minutes does it usually take to feed your baby/child?	<5	5-30	>30
Do you have to do anything special to help your baby/child eat?	YES	NO	
Does your baby/child let you know when he is full?	YES	NO	
Based on the questions above, do you have concerns about your baby/child's feeding?	YES	NO	

Red flag answers are in orange. If 2 or more of your answers are orange please contact your pediatrician.

Concerned? Take the full questionnaire:
feedingmatters.org/questionnaire

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Summary of Referral Considerations

- **Medical factors:**
  - Infant cries/arches at most meals
  - Persistent/chronic vomiting
  - H/o eating and breathing coordination problems w/recurrent respiratory illnesses
- **Feeding skills factors:**
  - Choking/gagging/coughing during meals
  - H/o traumatic choking incident
  - Delayed feeding transitions (purees by 10 months; table solids by 12 months; to cup for liquids by 16 months)
- **Psychosocial factors:**
  - Parent report of "picky" eating at 2 or more well-child visits
  - Mealtimes are often battle; child is difficult for everyone to feed
  - Parental history of eating disorder
- **Nutritional factors:**
  - Ongoing poor weight gain or weight loss
  - Aversion/avoidance of all foods in specific texture or nutrition group
  - Food range of less than 20 foods (especially if foods are being dropped with no new foods being added)

Adapted from Toomey, 2010[24]

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CDRC – Portland Feeding Team

April Mitsch, MS, RDN, IBCLC

Julia Farrell, OTR/L, IBCLC

Kristin Mangan, MA CCC-SLP

Sarah Sahl, RDN, LD
Dietetics Discipline Director

Darren Janzen, PhD

Karin Ide, MSN, CPNP

Lauren Beckett, MS, CCC-SLP

Erin Cochran, MA, OTR/L

Kevin Senn, MD

Sylvia Doan, MBBS

CDRC - Eugene Feeding Team

Amber Wright, CPNP, PMHS

Cat McGovern Zlotek, OTR/L

Kristin Gabaldon, OTD, OTR/L

Ansley Hill, RD

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Resources

- Chatoor I. **When Your Child Won't Eat or Eats Too Much**.
- Ernsperger L, Stegen-Hanson T. **Just Take a Bite: Easy Effective Answers to Food Aversions and Eating Challenges.**
- Fraker C, Fishbein M, Cox S, Walbert W. **Food Chaining: The Proven 6-Step Plan to Stop Picky Eating, Solve Feeding Problems, and Expand Your Child's Diet**.
- Jana LA, Shu J. **Food Fights: Winning the Nutritional Challenges of Parenthood Armed With Insight, Humor, and A Bottle of Ketchup.**
- Feeding Matters (**https://www.feedingmatters.org/**)
- Parent Tips / Picky Eaters (**http://spdfoundation.net/newsletter/2011/10/starlights-parents.html**)
- Feeding and Swallowing Disorders in Children / ASHA (**https://www.asha.org/public/speech/swallowing/feeding-and-swallowing-disorders-in-children/#sthash.geSYG7xZ.dpuf**)

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Thank You

wriamber@ohsu.edu | 541-744-6575