

MY CHILD WON'T EAT

How to help a child with a feeding disorder

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Disclosure

In the past 12 months, I have had no relevant financial relationships with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services discussed in this CME activity.

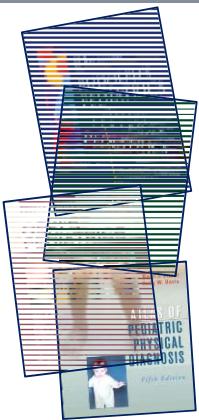
How to help a child with a feeding disorder

1. Utilize your skills as a pediatrician
2. Utilize your skills as a gastroenterologist
3. Utilize the skills of others



1. Be a pediatrician

- Assess for appropriate growth
- Monitor advancement of the diet
- Understand and optimize the mealtime setting



Assessment of growth

- Critically important for infants and young toddlers
- Utilize appropriate growth standards to assess overall growth
 - WHO Child Growth Standard for children 0-2 years of age
 - CDC 2000 revised charts for children 2-20 years of age
 - Estimate measures of body mass
 - Weight for length for children 0-2 years of age
 - BMI for 2-20
- Understand the growth trend over a time interval
 - Danner et al, NCP, 2009.



Monitor dietary advancement

Breast / Bottle only	0-4 mos
Smooth puree by spoon	4-6 mos
Soft chewables and cup	6-8 mos
Mashed table food	8-12 mos
Chopped table food	12-18 mos

*Development of Swallowing and Feeding: Prenatal through First Year of Life
Delaney & Arvedson, Dev Dis Res Rev, 2008*

Oral Phase:



		Touch	Taste
Afferent	Trigeminal (V)	Oral cavity, anterior 2/3 of tongue	None
	Facial (VII)	None	Anterior 2/3 of tongue
	Glossopharyngeal (IX)	Posterior 1/3 of tongue	Posterior 1/3 of tongue
Efferent	Trigeminal (V)	Muscles of mastication	
	Facial (VII)	Lips and face	
	Vagus (X) Hypoglossal (XII) C1 & C2	Tongue	

Pharyngeal Phase:



Afferent	Glossopharyngeal (IX)	Pharynx
	Vagus (X)	Larynx and Esophagus
Efferent	Trigeminal (V)	Tensor veli palatini
	Glossopharyngeal (IX) Vagus (X)	Palate, pharynx, larynx
	Trigeminal (V) Facial (VII) C1 & C2	Hyoid and laryngeal movement

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Optimize the mealtime setting

Eating in between meals will spoil your appetite...

- On-demand feeding of toddlers results in lower energy intake when compared to scheduled feeding.
 - Ciampolini et al, IJGM, 2013.
- Children with normal weight will decrease energy intake at meal to compensate for calories given as a snack 25 minutes prior to the meal.
 - Kral et al, AJCN, 2012.

Parental interaction and modeling during mealtimes influence subsequent feeding patterns

- Direct testimony regarding palatability of foods influences children's acceptance of foods.
 - Lumeng et al, Appetite, 2008.
- Parenting, social influences, and the food environment influence the development of eating behavior.
 - Ghagan, JDBP, 2012.

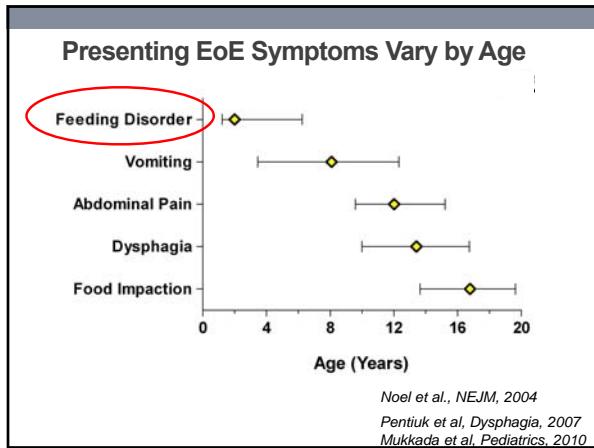
• choosemyplate.gov

2. Be a gastroenterologist

- Consider mucosal disease
- Consider aerodigestive problems
- Drive appetite as needed
- Consider supplemental tube feeding when appropriate







	Elemental Diet	Empiric Elimination	Guided Elimination	Topical Steroids	Systemic Steroids	Biologics	Dilatation
Mucosal Healing	>95%	=80%	Variable, Up to 70%	>65%	=99%	?	0%
Cost, labor	High	High	Low-Moderate	Low	Low	High (?)	High
Side Effects (Psychosocial)	High*	High*	Variable	Low	Moderate-High*	Low (?)	Low
Side Effects (Medical)	None	Low*	Low*	Rare	High	?	Moderate (?)
Acceptance by "sick" patients	High	High	High	High	High	High (?)	High
Acceptance by "well" patients	Low	Low	Moderate	High	Low	?	?

*Depending on patient factors and on difficulty of request

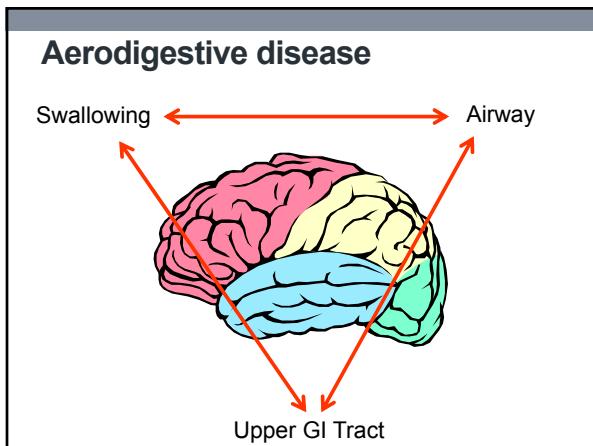
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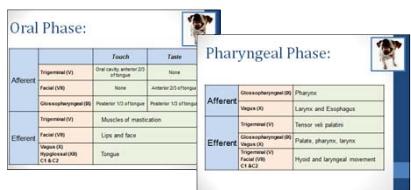
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Should children who aspirate be fed?

- No adequate trials exist upon which to form evidence-based conclusions:
 - No evidence to document pulmonary effects of allowing OR restricting drinking water in children who aspirate thin liquids.
 - Weir et al, Cochrane Database Sys Rev, 2012.
- At issue is balancing the need to acquire feeding skills with the need to maintain pulmonary health

Balance the need to acquire feeding skills...

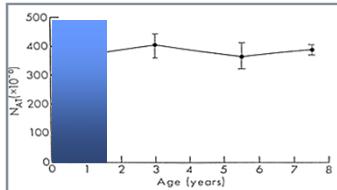


- “Hard-wiring” of neural pathways occurs during critical / sensitive periods
- Animal data suggest potential pathways regress in the absence exposure

Miller AJ, Dev Dis Res Rev, 2008

...with the need to maintain pulmonary health.

- Cadaveric analysis of 36 boys and 20 girls
- Age 6 wks – 14 yrs
- Boys developed more alveoli than girls of similar height
- Number of alveolar units stable after ≈18 months of life



Thurlbeck et al, Thorax, 1982

Use of imaging to understand risk

- CT scans of the chest detect pulmonary pathology in patients with CF **prior** to the onset of abnormalities in physical examination or pulmonary function testing.
 - Brody et al, JPeds, 2004.
 - Sanders et al, Ped Pulm, 2012.
- Presence or absence of radiographic findings in children with dysphagia can help formulate oral feeding regimens and goals.



- 12 mos-old female with static encephalopathy
- All oral feeder
- Silent aspiration on VFSS
- Normal physical examination



- 16 mos-old female with septooptic dysplasia and seizures
- All oral feeder
- Silent aspiration on VFSS
- Normal physical examination

Promotion of appetite



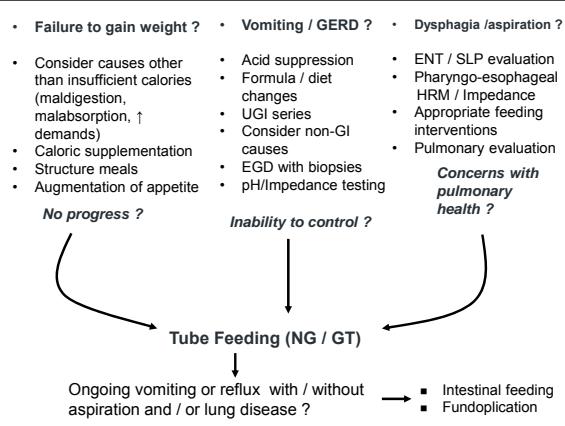
- Aversive effects of force feeding should be avoided; improvement in feeding requires hunger:
 - Innate motivator to feed
 - Resolution of hunger by feeding establishes a positive reinforcement to the feeding
- Environmental controls of the setting may be insufficient to effectively establish hunger and motivate feeding.
- Medical enhancement of hunger may be helpful alone, or in concert with therapeutic feeding interventions.

Megestrol acetate

- Progesterone derivative
- Appetite stimulant with indications for the treatment cachexia associated with malignancies and AIDS
 - Central hypothalamic effect ?
 - Inhibition of inflammatory cytokine production ?
- One study describes a 14-week outpatient tube-weaning protocol the included 6 weeks of megestrol acetate
 - Davis et al, JPGN, 2009
- Use limited by side effects affecting mood and adrenal function

Cyproheptadine

- First-generation antihistamine
 - H₁
- Anti-serotonergic effects
 - 5HT_{2A}, 5HT_{2B}, 5HT_{2C}, ..., 5HT₃
- Anticholinergic effects
 - mACh
- Antidiuretic effects
 - α₁ and α₂
- Orexic effect may be mediated via antagonism of 5-HT_{2C} receptors
- Orexic effect equivalent to that of megestrol acetate
 - Couloris et al, JPHO, 2008



3. Utilize the skills of others

- Feeding disorders may be broad and elements may spill into areas that are beyond pediatric GI training and scope of practice.
- May require coordinated input from other specialists:
 - Other medical specialists
 - Specialists in feeding skill acquisition
 - Pediatric psychologists with skills in feeding

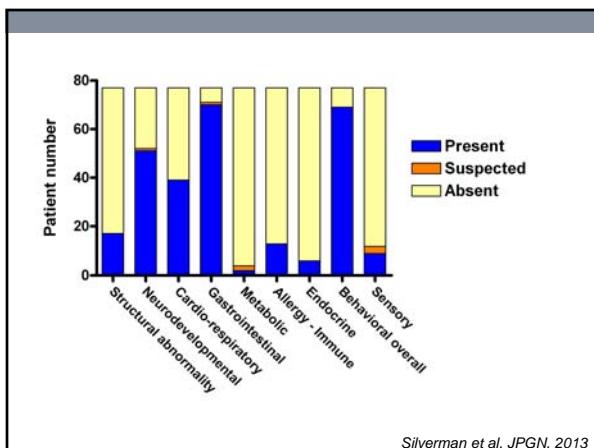
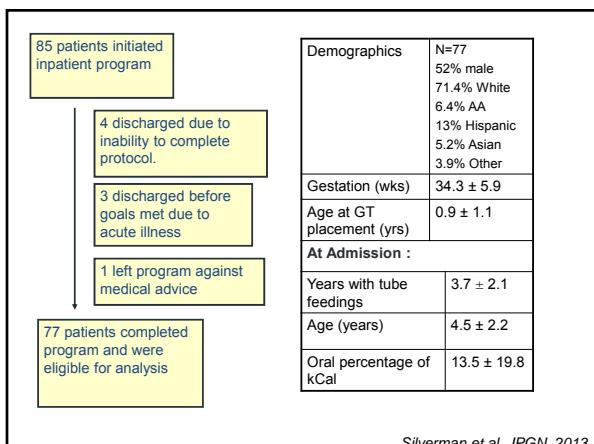


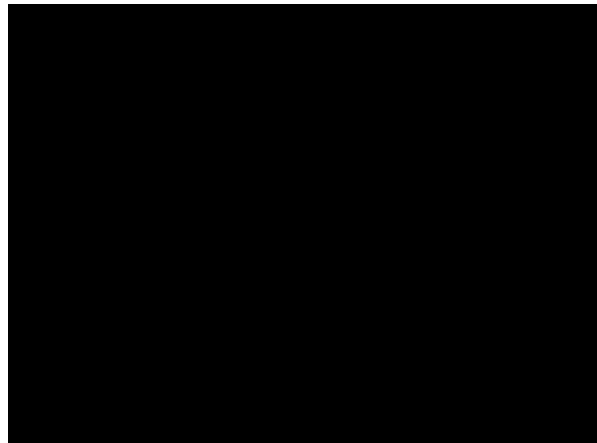
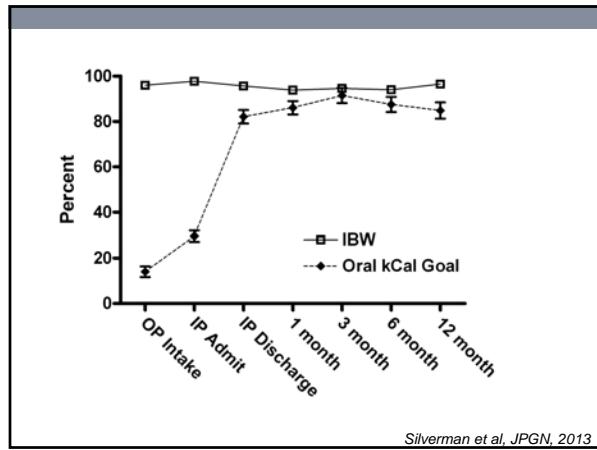
Behavioral Interventions

- Differential reinforcement techniques
 - Negative reinforcement
 - Stimulus control procedures
 - Shaping
 - Appetite manipulation
 - Inpatient interventions



Silverman NCP 2010





Partial List of Feeding Programs	
• Baylor Healthcare Children's House	• Mt. Washington Pediatric Hospital
• Children's Hospital Colorado	• Nationwide Children's
• Children's Medical Center of Dallas	• Penn State Hershey
• Children's Hospital of New Orleans	• St. Joseph's Healthcare System
• Children's Hospital of Orange County	• UMass Memorial Medical Center
• Children's Hospital of Philadelphia	• University Hospital Graz (Austria)
• Cincinnati Children's Hospital Med Center	• University of Iowa
• Cleveland Clinic	• University of Nebraska
• Duke University	• University of Rochester
• Helen DeVos Children's Hospital	• Vanderbilt University
• Hospital Pereira Rossell (Uruguay)	
• Kennedy Krieger Institute	
• Marcus Autism Center	
• Montreal Children's Hospital	

FEEDING MATTERS

Chris Linn, Executive Director
602.222.6222
feedingmatters.org



Conclusions:

1. Utilize your skills as a pediatrician
2. Utilize your skills as gastroenterologist
3. Utilize the skills of others