

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.

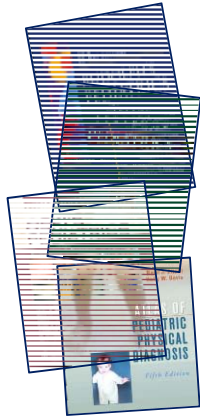
How to help a child with a feeding disorder

1. Utilize your skills as a pediatrician
2. Utilize your skills as 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:



		<i>Touch</i>	<i>Taste</i>
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

Monitor dietary advancement

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Optimize the mealtime setting

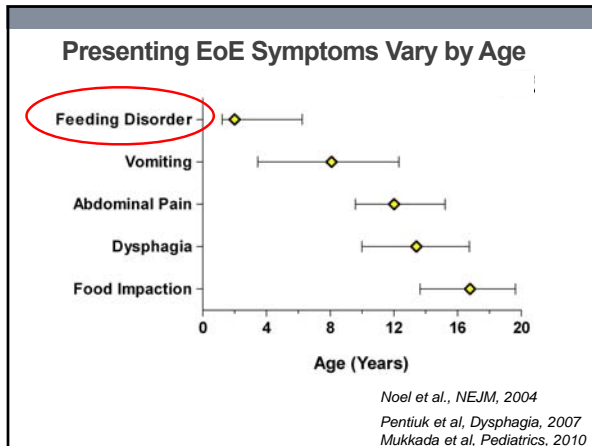
- **Eating in between meals will spoil your appetite...**
 - On-demand feeding of toddlers results in lower energy intake when compared to scheduled feeding.
 - *Ciampolini et al, IJGM, 2013.*
 - Children with normal weight will decrease energy intake at meal to compensate for calories given as a snack 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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Balance the need to acquire feeding skills...

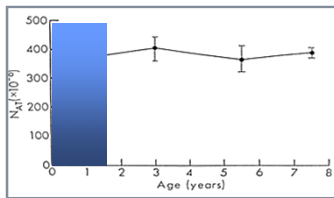
Oral Phase:			Pharyngeal Phase:		
	Touch	Taste			
Afferent	Inferior Vagus (XII)	Oral cavity, anterior 2/3 tongue	Trigeminal (V)	Pharynx	
	Facial (VII)	None	Trigeminal (V)	Larynx and Esophagus	
	Glossopharyngeal (IX)	Posterior 1/3 tongue	Trigeminal (V)	Tension of palate	
Efferent	Inferior Vagus (XII)	None	Glossopharyngeal (IX)	Palate, pharynx, larynx	
	Facial (VII)	Lips and face	Trigeminal (V)	Hyoid and laryngeal movement	
	Hypoglossal (XII)	Tongue	Cranial Nerve (CN) XII		

- “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.

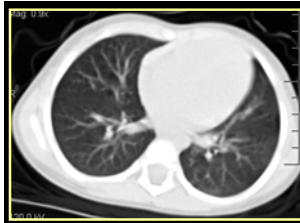
- Cadaveric analysis of 36 boys and 20 girls
- Age 6 wks – 14 yrs
- Boys developed more alveoli than girls of similar height
- Number of alveolar units stable after ≈18 months of life



Thurlbeck et al, Thorax, 1982

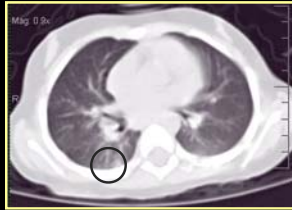
Use of imaging to understand risk

- 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.

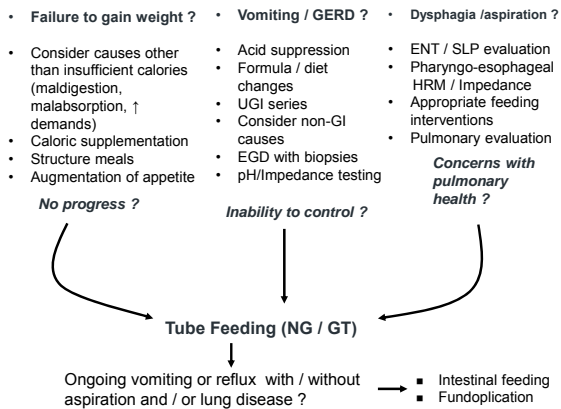
Megestrol acetate

- 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
- Antiadrenergic effects
 - α₁ and α₂
- Orexic effect may be mediated via antagonism of 5-HT_{2C} receptors
- Orexic effect equivalent to that of megestrol acetate
 - *Couluris 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

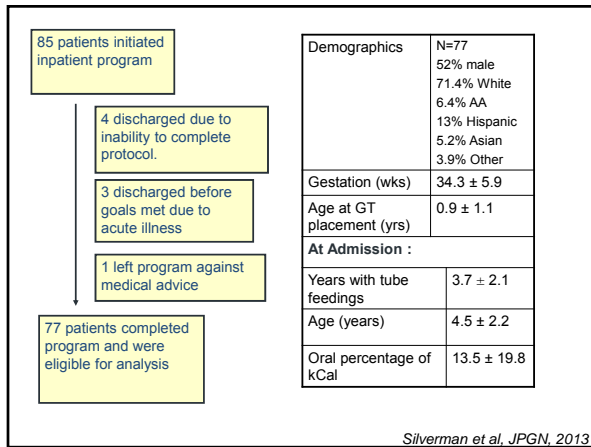


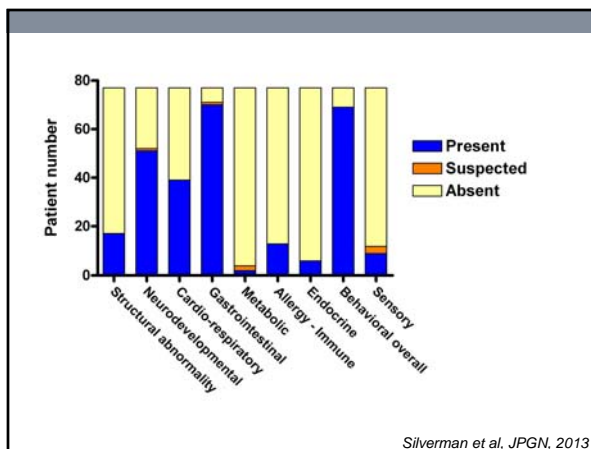
Behavioral Interventions

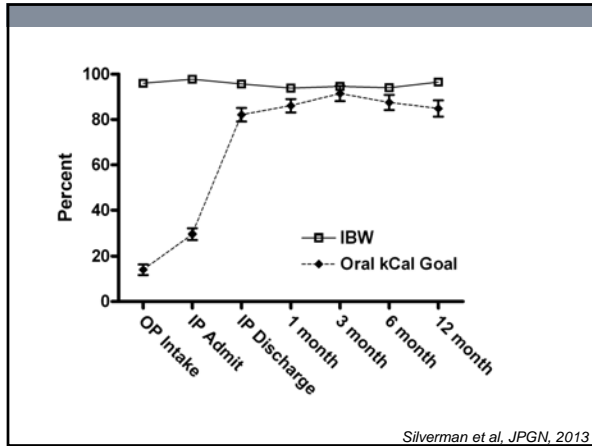
- Differential reinforcement techniques
- Negative reinforcement
- Stimulus control procedures
- Shaping
- Appetite manipulation
- Inpatient interventions

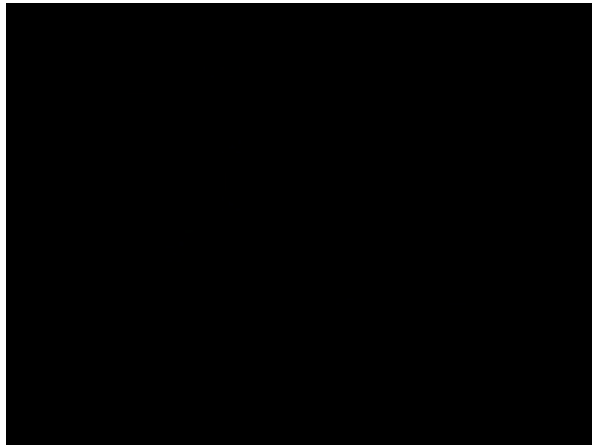


Silverman, NCP, 2010









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

FEEDING MATTERS

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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