



# Pediatric Feeding and Dysphagia Newsletter

Dear Fellow Feeders,  
 As usual, we include articles, current research, an editorial, and a challenging case. Please checkout ASHA's SID 13 October Newsletter which is dedicated to pediatric feeding and swallowing!  
 Enjoy, Krisi                      feedingnewsletter@gmail.com



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**Treating Pediatric Feeding Disorders: The Encouragement Feeding Program** by Mary C. Tarbell, Med CCC-SLP, Director, Encouragement Feeding Program, University of Virginia's Children's Hospital

Feeding disorders that occur in children with physical and cognitive disabilities tend to be severe and persistent. These children typically experience many months of invasive oral procedures, are unable to regulate their own hunger/satiety, and miss out on the critical period of oral exploration and exposure. These feeding difficulties may be severe enough to warrant the placement of a supplemental feeding tube or result in a disrupted/disordered transition to normal-for-age eating habits.

In the past, children with feeding disorders have been classified as having organic or non-organic etiologies to their feeding disorders. More recently it is felt that this dichotomy is no longer accurate. Instead these children demonstrate a combination of factors that include physical, social, developmental, behavioral, temperamental and environmental issues.

In order to treat feeding disorders successfully in an efficient, effective manner it is important to first characterize these children by the primary and secondary barriers that may be preventing them from becoming competent eaters and secondly, to recognize how the elements of hunger, intact sensory processing and transitional stages in oral motor development impact normal eating behaviors.

This article describes an intensive, day treatment feeding program designed to treat children holistically; incorporating all of the above elements to help them transition to normal-for-age eating habits.

The University of Virginia's Kluge Children's Rehabilitation Center is home to the Encouragement Feeding program. Since its inception in 1991,

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## Treating Pediatric Feeding Disorders: The Encouragement Feeding Program

by Mary C. Tarbell, Med CCC-SLP, Director, Encouragement Feeding Program

The Encouragement Feeding program (EFP) has seen more than 350 children from all over the world. They currently use a unique classification system to describe and categorize their patients that results in a streamlined treatment approach. The philosophy of the EFP is three fold: Children need to have sensory systems that are organized and able to process and modulate all of the sensory aspects of eating; Children may need to be taught the mechanics of eating as they missed out on the critical period of learning to eat; and they need to be taught to recognize and act on internal motivation/hunger. These elements should be addressed in a family-centered care environment.

All children in the EFP are seen by a speech-language pathologist, an occupational therapist, a therapeutic recreation therapist, an educator, a nutritionist and a developmental pediatrician. A Neurodevelopmental psychologist is available if needed. Parents are included in all decision making processes and attend all meals.

As a prerequisite to intensive feeding therapy, all physical aspects need to be identified and treated aggressively. Ongoing cardiac or respiratory issues may result in poor quality and quantity of oral intake. Unresolved gastrointestinal issues including reflux, slow emptying, and constipation can significantly hamper a child's desire to eat. Adequate growth based on individual growth parameters is imperative to the timing of when to use hunger to stimulate increased oral interest and must be evaluated prior to admission. Because there has been an increase in children referred who exhibit signs and symptoms of anxiety and rigidity that negatively impact their ability to transition to normal-for-age diets/textures, referral to a child psychologist to further examine signs of anxiety may also be warranted.

Only once these aspects are stable can treatment be efficient and effective. Most of the children referred to the EFP have had comprehensive physical evaluations and the majority of their medical complexities have been resolved. Most often these children have also been in local feeding therapy for quite some time. Parents report some progress but are frustrated by lack of total resolution of the feeding difficulties.

The EFP was designed specifically to help children with feeding disorders overcome their aversion, inexperience, hypersensitivity and/or rigid eating habits through intensive and individualized treatment. A retrospective study of 83 children who attended the Kluge Children's Rehabilitation Center's Encouragement Feeding program was completed in 2001 in order to determine if there were any elements that were shared by these children that impacted their ability to progress to normal-for-age eating. Five elements or "barriers" were identified. These "barriers" appeared to contribute to the continued dependence on a supplemental feeding tube at the time of admission. Since the 2001 study, the referral rate of non-tube dependent children has increased dramatically. This barrier classification system has been applied to these children as well. These barriers are:

**Disrupted Hunger/Satiety Regulation:** Those children who know how to bite and chew but have never regulated their own hunger/satiety, and therefore do not eat enough to have their tube feedings or reliance on formula reduced.

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**Inexperience:** Those children who have no experience with eating and need to be taught how to move food around in their mouths. These children have very hypersensitive gag reflexes and tend to avoid foods and messy textures.

**Disordered Contingency Learners:** Those children with disordered learning have difficulty understanding behavioral shaping principals commonly used in therapy to increase oral exploration.

**Sensory/Anxiety:** Those children whose sensory systems are severely impaired and are unable to approach eating due to sensory overload or true anxiety. Many of these children are rigid eaters. Sensory overload and/or anxious behaviors are usually seen in all environments rather than just at meal times.

**Psychosocial:** Those children who had normal oral functional and sensory status but who appear to have ongoing parent-child interaction or attachment issues that interfere with normal eating habits.

The above barriers are rarely seen in isolation, but instead overlapped to create a complex feeding disorder that has not resolved despite months of outpatient therapy. It is possible to separate out which barrier is the primary reason for the child's lack of motivation to eat orally at the time of referral. Use of the categorization system has allowed for additional refinement of the Encouragement Feeding program prior to, during and following admission.

### Hunger and Satiety

For the population of children who are classified as mainly needing to establish **hunger/satiety**, all therapies focus on food exploration and parent education regarding normal for age toddler development and play. All children are placed on a normal for age meal schedule with 3 meals and 2 to 3 snacks. At each meal emphasis is placed on parent education regarding normal toddler eating habits and the use of contingencies to increase oral intake per meal. Most of these children are eating some regular textured foods prior to admission but all are dependent on tube feedings or on an oral supplemental formula for more than half of their calories. At discharge, the majority of these children are receiving less than  $\frac{1}{4}$  calories via tube or through supplemental formula. Following discharge, this group of children rarely requires continued oral functional therapy as they demonstrate oral competence, have learned to recognize hunger and are able to act independently on those cues. Hunger paired with structure, limits and parent education result in children who independently and happily come to the table.

### Inexperienced Eaters

Children who demonstrate significant oral **inexperience** are also fed on a normal for age meal schedule. However, their meal times consist of intensive oral functional therapy directly aimed at teaching the basic elements of biting and chewing, or moving from eating nothing to tolerating and feeling comfort-

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able with pureed foods. Parents receive information regarding the normal progression from pureed to biting and chewing skills as well as information regarding behavior shaping to help. They also receive daily information regarding normal toddler mealtime behaviors. Additionally, tube feedings are reduced to help increase understanding of hunger.

### Learning Barriers

Children classified as having **learning** barriers based on written information from home therapists or school personnel are placed in this category. These children tend to have disordered learning profiles versus delays. Children with cognitive skills reported at the 18-month level are considered for the program. At times, however, information provided by local therapists may paint an incomplete picture and in reality these children demonstrate a very scattered profile, with highly disordered learning status. All of these children also receive intensive oral functional therapy during meal times, however, this group of children has difficulty understanding the stimulus used to teach biting and chewing as well as with comprehension of contingencies and simple behavior shaping principals. It is felt that with significantly longer admissions or postponement, this group of children may have more success. These children continued to receive ongoing oral functional and occupational therapy locally following discharge.

### Psychosocial issues

A very small number of the 350 children seen in the program actually demonstrate significant difficulties with **psychosocial** issues as defined by significant impaired parent-child interactions. These children tend to have good oral functional skills and eat a variety of foods. Most often, they are limited in volume eaten and these children tend to eat better for others. The emphasis during their admission is placed on improving parent child interactions, especially regarding mealtime management. Recreational therapy time is used to promote normal parent-child play and interactions. In-house Psychology referrals for several of these families and formal attachment evaluations occurred and these families were referred to psychologists in their home communities for ongoing therapy in attachment and parenting skills.

### Sensory/Anxiety Issues

The majority of the children admitted to this feeding program have a history of expected sensory defensiveness on an oral, tactile and whole body level. However, many demonstrate significant decreases in these behaviors prior to admission. The children who fit into this category, however, demonstrate significantly more profound sensory or anxiety issues. Problems are observed during transitions between activities and extreme food phobia with a "fight or flight" behavior is noted during all therapy sessions. Some children are noted to demonstrate physical elements of sweating, gagging and vomiting at the mention or sight of foods. These children appear to demonstrate such significant issues with anxiety that the oral aversion appeared to be just one symptom, not the entire problem. Use of SSRI's to decrease anxious behaviors has been successful in many children in this category. Parents fill out the Achenbach Child Behavior Checklist to determine the significance of the anxiety

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and then are either referred to their Primary Care physician to discuss the possibility of using an SSRI to treat the anxiety prior to their admission or are seen by our Developmental Pediatrician and placed on an SSRI during the program. Use of SSRI's have been successful in reducing the physical symptoms of anxiety and helping these children be more open to intensive oral functional therapy.

Classification by the above barriers has been helpful in individualizing the emphasis during these children's admissions to the EFP. Parent education and direct therapy differed depending on the predominant barrier. The above barriers are now being used prospectively to individualize recommendations made prior to admission to shorten length of stay and to use resources more efficiently.

In addition to identifying the predominant barriers to normal eating, there are several other elements that contribute to the success of the Encouragement Feeding program. These elements include creation of hunger/satiety, immersion in sensory activities that address the whole child, immersion in oral functional therapy to build success with textures and treatment in a family centered care environment. Additionally, emphasis is always placed on quality of meal time interactions versus quantity of oral intake.

In order to make the transition to normal for age eating habits work long term, each child must develop an internal motivation to eat. Some children may eat in the short term to receive praise or rewards, but will not continue such behavior long term if their bodies are not internally motivated to do so. Some may also eat small amounts but not the necessary amounts to ensure adequate growth. One of the most important elements of the EFP is the development of hunger/satiety. In order to create this internal motivation, children need to be made to understand hunger/satiety as much as possible. This takes place through cutting back or rearranging the tube feeding schedule to create the feeling of hunger and fullness. Prior to admission, it is suggested that the tube feedings be divided up throughout the day in a more physiologically normal manner versus use of nighttime drips. For some children, daytime bolus' are not always feasible due to frequent emesis. In these cases, a combination of daytime bolus' and shorter nighttime drip is recommended, or perhaps consideration of a blended diet that is heavier and more difficult to vomit. Once this has been accomplished for a few weeks, it is necessary to be as aggressive as possible with cutting back on daytime feeds to allow for the beginning of hunger to develop. Decreases in tube feeding must be based on current growth parameters as determined by the nutritionist. Drastic reductions in tube feedings may result in cranky children, so it is important to temper reductions with oral amounts taken in. Hydration is equally important and any reductions in formula should be replaced with water. After the feelings of hunger are established, it is time to teach these children that it is their responsibility to eat, not the parents responsibility to "make" them. In the long term, the child needs to be taught that the parent will provide the foods, but that it is their responsibility to take in enough for growth. For our non-gastrostomy tube dependent children who rely on formula via cup or bottle, the principal is the same. Reducing the caloric density or access to the formula is a must in order to develop hunger. In order to not have a very cranky child, adding water or milk to the formula in order to cut calories may be the way to go. Adding 4 ounces of water to 4 ounces of pediasure allows the child to feel a full tummy, keeps up hydration but cuts the calorie content in half. For some children, hunger is not as powerful. These children tend to be the ones with



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HUGE sensory integration issues or those with anxiety or significant rigidity. These children have difficulty isolating hunger from pain. For these children it is very important to treat their underlying sensory integration disorder, anxiety or rigidity before being too aggressive with feeding therapy.

The second element is immersion into a whole body sensory experience; not just focusing on any oral aversion. Most of these children have sensory systems that are disordered. Oral aversion is usually just one element to their sensory difficulties. A successful treatment plan must include intensive sensory integration therapy that addresses the entire body. This can be accomplished through direct OT, therapeutic recreation, hydrotherapy and preschool. OT and PT address the traditional areas of difficulty through gross and fine motor play, and therapeutic recreation and preschool accomplish this through developmentally appropriate activities such as planting plants, playing in sand, making peanut butter play dough, or playing in the water. Addressing the child's proprioceptive sensory needs prior to a food activity may help them be more receptive to the task. Some of these children may have such severe sensory integration disorders that they are not able to function well on a daily basis. These children are characterized by poor frustration tolerance, poor sleep habits, poor transitions and inability to focus on one activity for very long. There are medications that can be used to help "soothe" the sensory system and allow for better progress in therapy.

Equally important as immersion into the sensory situation is the immersion into the oral experience. Some of these children have missed out on the critical period of time when learning to eat is normal and have no pleasant oral experience. Most of these children have put very little in their mouths and when they put food items up to or in their mouths, gagging occurs. Any treatment plan must take into account the eating experiences brought by each child and begin accordingly. With most of the children, even those able to bite and chew higher textures, therapy starts with creamy foods. This is usually a texture that causes gagging but when thinned down is tolerated better. The process initially is to teach the child to accept the bite and swallow, over and over again, to get comfortable with weight of food in their mouths. Only then can the food be thickened and increased in texture. It is important to identify the cause of the gagging, ie: weight, placement, texture, smell or thought and then treat accordingly. Biting and chewing and lateralization of foods are done in front of a mirror and many times need to be taught. Some children with feeding disorders may avoid certain textures due to severe oral hypersensitivity or due to motor planning difficulties. Some children can not tolerate the sharpness of crumbs and require focus on soft, squishy foods that do not break apart in the mouth. Other children do well with dry, meltable foods but can not tolerate mixed textures.

The last element that contributes to the success of the EFP is treatment in a natural environment using the principals of family centered care. Family centered care supports the family as the constant in the child's life who need to make informed decisions based on complete and unbiased information on an ongoing basis. Each family has individual strengths that should be respected and supported. All family members are welcome in the EFP and participate in all therapy services including meals. Family education occurs at all meals and incorporates portion sizes, typical for age foods, typical for age behaviors and normal progression of feeding skill acquisition. Most families report feeling very prepared for discharge and understand the next set of goals to be addressed at home.

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Proper classification of children with complex feeding disorders is a must in order to treat them holistically, individually and successfully. The EFP has had success using a "barrier classification system" which identifies the primary barrier to eating and treats accordingly. The use of this system has allowed for streamlining of the program prior to, during and following service provision. Additionally, helping children overcome elements of hypersensitivity, inexperience and teaching them to recognize signs of hunger/satiety are imperative if they are to become competent, happy oral feeders.

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### **Editorial:** How Do We Define Success in Feeding and Swallowing Therapy?

**By Krisi Brackett**

How do we define successful outcomes in feeding and swallowing therapy? There may be no single right answer to this question but the idea of success and outcome in feeding intervention is an important one to consider for several reasons. First, therapists must designate goals for many insurance companies and for medicaid in order to obtain coverage. It is also important to understand the parent's or caregiver's goals for their child. Their desires may not always be the same as the professional's goals. And finally, as therapists, we must use our experience and knowledge to assist families with appropriate and realistic goals. This guides the therapy sessions and home programs.

During my evaluation, I always ask families what their goals and desires are for their child. For most, it is obvious. They want their child to eat by mouth, they want to get rid of the feeding tube, they want their child to get off purees and eat what the rest of the family eats and they want their child to eat a nutritious diet. But for some caregivers, the feeding tube has provided necessary relief from the difficulty of nourishing their child and the goal might be for enjoyment of oral foods or solely for weight gain and growth.

Examples of feeding and dysphagia goals :

1. oral motor function (example, Patient will use a vertical chewing pattern for solids).
2. volume of intake (example, Patient will accept 4 oz of puree at meals with 80% success)
3. transition from tube feeding to oral feeding (Patient will take 50% of nutrition by mouth and 50% orally).
4. Variety of intake (patient will accept fruits, vegetables, and meat in their daily intake).
5. Patient will drink thin liquids without signs of aspiration.

This is an on going process as insurance companies and Medicaid requirements change.

## **GI Issues that Interfere with Successful Feeding, How to Recognize the Symptoms and Intervene Successfully.**

**By Krisi Brackett MS SLP/CCC**

There are many reasons that infants and children develop feeding problems. These underlying issues can range from prematurity, neurological dysfunction, respiratory diagnoses, gastrointestinal dysfunction, and learned patterns of behavior. A significant number of children have feeding difficulty related to their GI dysfunction. Working closely with your child's medical team can improve their "gut comfort" which will improve the response to feeding therapy. Therapy techniques such as improving volume and variety of intake, ease of feeding, comfort during feeding, desire to eat, and even oral motor therapy will be easier if the child feels better.

**What types of GI disorders contribute to feeding problems and how do they present to the feeding therapist?**

### **Constipation:**

**Definition** – Constipation, defined as a delay or difficulty in defecation, present for 2 or more weeks, is a common pediatric problem encountered by both primary and specialty medical providers. ([www.aap.org/healthtopics/gastroenterology.cfm](http://www.aap.org/healthtopics/gastroenterology.cfm))

**Presentation:** Constipation can slow the motility. Children may present with poor appetite, volume limiting, grazing, picky eating, food refusal, and behavioral feeding aversion.

**Ask:** Ask about stooling patterns (how often, size of bowel movement, ease of passage (straining, grunting), consistency (hard/soft).

**Intervention:** If a child is having feeding difficulty we want to keep the system moving (daily stooling). Good constipation management can make a difference in intake in terms of volume accepted, can lessen reflux symptoms, and improve gut comfort. Recommendations may include a "clean out" and then therapy to keep the system moving including diet changes, hydration, fiber, stool softeners, and laxatives.

### **Gastroesophageal Reflux**

**Definition** – a condition in which stomach contents - food and gastric acid - frequently flow back up out of the stomach into the esophagus. The food that comes up may or may not flow all the way out of the mouth. It may be forceful vomiting which rapidly and completely empties the stomach, or it can be more like a "wet burp" that doesn't reach the mouth. [www.reflux.org](http://www.reflux.org)

**Presentation:** Reflux can cause pain, irritation, and learned association between eating and discomfort. Children may present with vomiting (especially during and after meals), spitting up, reswallowing, gagging, solid food dysphagia, food refusal, extreme picky eating, volume limiting, gagging, texture refusal, oral hypersensitivity, irritability with meals, poor sleeping, failure to thrive, complaints of stomach pain, preference for drinking water, grazing, preference for eating while standing, arching, and many types of aversive feeding behaviors.

**Ask:** Ask about hard and soft signs of reflux which can include vomiting/spitting up (when it occurs), sleeping patterns, pulmonary issues, coughing and choking with liquids and solids, nasal and chest congestion, acidic smelling breath, stomach pain, and feeding difficulties.

**Intervention:** reflux management can include behavioral modifications (swaddling, position changes, calming techniques), medical and nutritional management (medicines, formula changes), and surgical intervention (nissen fundoplication).



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### Eosinophilic Esophagitis

**Definition:** allergic inflammatory disease characterized by elevated eosinophils in the esophagus. EE is a newly recognized disease that over the past decade has been increasingly diagnosed in children and adults.

[www.apfed.org](http://www.apfed.org)

**Presentation:** Reflux that doesn't respond to usual medicines, dysphagia, nausea and vomiting, FTT, poor appetite, abdominal pain, feeding refusal, poor sleeping. Often goes along with milk intolerance and food allergies.

**Ask:** reflux questions, intolerance/allergies (hives, eczema, rash, swelling, blood in stool), poor improvement in symptoms despite reflux management.

**Intervention:** while treatment may vary, it often includes oral steroids to reduce inflammation, an elemental diet, and periodic endoscopy with biopsy to monitor improvement.

### Dyspepsia

**Definition:** Dyspepsia refers to pain or discomfort centered in the upper abdomen. [www.iffgd.org](http://www.iffgd.org)

**Presentation:** pain and discomfort in the upper middle region of the abdomen (pain may occur around eating), discomfort with sensation of fullness after meals, an early feeling of having had enough to eat (satiety), bloating, belching, nausea, retching, vomiting, regurgitation, anorexia, or food refusal. [www.iffgd.org](http://www.iffgd.org)

**Ask:** reflux symptoms, feeding patterns (grazing, volume limiting), pain, sleeping patterns, aversive feeding behaviors.

**Intervention:** May include management options for "gut comfort: medicine, formula changes, slowing rate of tube feedings.

### Gastroparesis

**Definition:** also called delayed gastric emptying, is a disorder in which the stomach takes too long to empty its contents. [www.iffgd.org](http://www.iffgd.org)

**Presentation:** nausea, vomiting, volume limiting, grazing, weight loss from poor intake.

**Ask:** feeding patterns (grazing, volume limiting), weight gain and growth, aversive feeding behavior, reflux symptoms.

**Intervention:** May include small meals more often, medicines for motility, pain, and/or nausea, slow tube feedings, and formula changes.

## On the Research Front:

**Machado RS, Yamamoto E, da Silva Patrício FR, Reber M, Kawakami E. Gastric emptying evaluation in children with erosive gastroesophageal reflux disease. *Pediatr Surg Int.* 2010 May;26(5):473-8. Epub 2010 Feb 21. PMID: 20405273**

Delayed gastric emptying may be an important contributing factor to gastroesophageal reflux disease (GERD) in children, but there are limited data on its evaluation in children with erosive-GERD. This study looked at the gastric emptying of solids in patients with erosive-GERD. 19 patients with erosive esophagitis and 14 healthy controls were compared. The two most prevalent symptoms were nausea and epigastric pain, which were reported by 12 (63.2%) patients. Irritable bowel syndrome was present in 26.3% (5/19). The median gastric emptying half-time in patients was 160 min, which was not different from the controls' figure. Authors concluded that delayed gastric emptying is not associated with erosive esophagitis in children with GERD, when compared to controls.

**Williams KE, Field DG, Seiverling L. Food refusal in children: a review of the literature. *Res Dev Disabil.* 2010 May-Jun;31(3):625-33. Epub 2010 Feb 13. PMID: 20153948**

Food refusal is a severe feeding problem in which children refuse to eat all or most foods presented and exhibit problems with growth. This review discusses the definition, etiology, and interventions pertaining to food refusal. The interventions utilized for food refusal typically consist of several treatment components. These treatment components are reviewed and implications for future interventions are discussed.

**Giambra BK, Meinzen-Derr J. Exploration of the relationships among medical health history variables and aspiration. *Int J Pediatr Otorhinolaryngol.* 2010 Apr;74(4):387-92. Epub 2010 Feb 16. PMID: 20163881**

This study had 2 aims; determine the relationships of health history questions and their child's risk for aspiration as determined by a swallow study and to identify key factors which may predict a child's risk for aspiration. 198 subjects had a FEES or VSS. Of these, 18% (n=36) aspirated and 21% (n=42) were found to have penetration. Many of the factors identified in the health history were found to be significantly associated with aspiration or penetration. The variables "demonstrated aspiration" (this included parent or caregiver seeing food in the tracheotomy tube or aspiration noted on a previous FEES or VSS), "hypotonia" and "tracheotomy" were most predictive of aspiration. History of tracheotomy was found to have an inverse relationship with aspiration. "gastroesophageal reflux" (GER) was most significantly associated with penetration, followed by "prematurity" and "developmental delays". Based on the prediction model, the probabilities for a child with a history of combinations of the above variables to have aspiration or penetration were calculated. Authors concluded, that significant relationships exist between aspiration or penetration and the family's answers about their child's medical history. Practitioners should consider a swallow assessment whenever a child has a history which includes variables with a strong association with aspiration or penetration.

**Sen TA, Ayçiçek A. Do children with adenotonsillar hypertrophy have lower IGF-1 and ghrelin levels than the normal children? *Int J Pediatr Otorhinolaryngol.* 2010 Jun;74(6):665-8. Epub 2010 Apr 14. PMID: 20394991**

Authors aimed to determine serum IGF-1 levels and plasma ghrelin levels in male children with adenoid and tonsillar hypertrophy and compare with healthy controls. 44 male children with obstructive adenotonsillar hypertrophy

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## On the Research Front:

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and age matched healthy male children as control group were enrolled. In both the groups plasma ghrelin and serum IGF-1 levels were measured in the morning. Results indicated that male children with adenotonsillar hypertrophy had significantly depressed serum IGF-1 levels and plasma ghrelin levels compared to control group. Body mass indexes of children with adenotonsillar hypertrophy were significantly lower than those of their healthy peers. Conclusions indicated that delayed growth in male children with adenotonsillar hypertrophy may be related to the lower serum IGF-1 and plasma ghrelin levels compared to that of normal male controls. Since ghrelin increases hunger and food intake and its levels increase before the meals, lower levels lead to decreased appetite and also swallowing difficulties in children with adenotonsillar hypertrophy may lead to suboptimal nutrition. Lower serum levels of IGF-1 in children with adenoid and tonsillar hypertrophy may be secondary to deficient growth hormone stimulation by ghrelin.

**Ekstein S, Laniado D, Glick B. Does picky eating affect weight-for-length measurements in young children? Clin Pediatr (Phila). 2010 Apr;49(3):217-20. Epub 2009 May 29. PMID: 19483138**

Picky eating is a major source of parental concern, and children with picky eating habits are potentially at risk for nutritional deficits. This research aimed to determine whether picky eating is related to being underweight in young children. 34 children with picky eating behavior who were referred to the Pediatric Feeding and Nutrition Clinic for evaluation and 136 healthy controls were studied. Weight and height measurements were obtained, and weight-to-length data were calculated for each child. In all, 7 of 34 children (20.6%) in the picky eaters group and 9 of 136 children (6.6%) in the control group were underweight ( $P = .02$ ). Underweight was found in 15 children (14.2%) at or under 36 months and in 1 child (1.6%) older than 36 months. Children with picky eating habits, especially those younger than 3 years of age, are at increased risk of being underweight.

**Mukkada VA, Haas A, Maune NC, Capocelli KE, Henry M, Gilman N, Petersburg S, Moore W, Lovell MA, Fleischer DM, Furuta GT, Atkins D. Feeding dysfunction in children with eosinophilic gastrointestinal diseases. Pediatrics. 2010 Sep;126(3):e672-7. Epub 2010 Aug 9. PMID: 20696733**

The authors' aim was to characterize feeding dysfunction (FD) in children with EGIDs. A retrospective analysis of 200 children seen in a multidisciplinary Gastrointestinal Eosinophilic Diseases Program was performed. 33 children identified as also having FD were examined, including information obtained by history, physical examination, feeding evaluation, review of nutritional data, allergy testing and histologic assessment of mucosal biopsies. Of 200 children with EGIDs, 16.5% had significant FD. The median age of this group was 34 months. A variety of learned maladaptive feeding behaviors were reported in 93.9%. Frequent gagging or vomiting occurred in 84.8%. Food sensitivity was documented in 88% while 52% had other allergic disease. Twenty one percent were diagnosed with failure to thrive and 69.7% required individual or group feeding therapy. Forty-two percent had residual eosinophilia of  $>15$  per HPF on esophageal biopsies performed at the time of symptoms. FD is prevalent in children with EGIDs often presenting as maladaptive learned feeding behaviors with altered mealtime dynamics and physical difficulties in eating mechanics. FD can persist even after eosinophilic inflammation is successfully treated. Awareness of the increased prevalence of FD in children with EGIDs will enable earlier recognition of this problem, resulting in a comprehensive, individualized treatment plan with the desired outcome of improving the development, feeding, and nutrition of these children. PMID: 20696733

# Case by Case: Identifying GI symptoms that interfere with feeding success

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**History:** LH is a 2 year old female referred for retching, feeding difficulty, g-tube dependency, and loose stools. Complicated med hx: agenesis of the corpus callosum, dev delay, repaired VSD, repaired tethered cord, hypothyroidism, cortisol deficiency, GERD, g-tube/nissen, multiple URI's and pneumonia, RAD/seasonal allergies, frequent runny nose and upper airway congestion.

**Feeding:** Receives all nutrition via g-tube. Feeding includes 5 bolus feeds of pediasure with daily retching and discomfort.

Oral feeds: foods are offered. LH refuses most foods but may lick crackers. She does not swallow any foods.

\*\*\*[\(Many caregivers think their child can not swallow because they refuse foods, however, this is often related to gut pain, nausea, and poor tolerance of tube feeds\)](#)

**Previous feeding Therapy:** LH has had 3 feeding therapists with poor progress toward eating. She is currently working toward biting and chewing.

## Feeding Team Evaluation: (GI, Nutrition, Speech)

**Oral Motor Exam:** WNL for structures. Low tone in jaw and facial muscles with frequent open mouth postures/forward tongue. Noted red eyes and nasal congestion.

**Feeding:** Parent's offered puree on a spoon, which LH refused. She gagged when puree was placed in her mouth. She licked crackers but would not bite or swallow them. **Tube feeding:** observed with subsequent retching, coughing, and discomfort.

**Intervention:** [\(if a child is gagging, retching and uncomfortable on a daily basis, it will be very difficult if not impossible for them to progress with feeding and learning to eat\)](#)

**Goal:** improve comfort of tube feeding

1. Trial a new formula: Compleat Pediatric
2. Slow rate using a back pack feeding pump, may need continuous feeds to achieve comfort. [\(we recommended a zevex back pack pump which makes it easier to slow feeds\)](#)
3. Increase prevacid from 15 mg once/day to twice/day.
4. Refer for allergy testing.

Hold on feeding therapy until LH is more comfortable with tube feeds.

\*\*\*[From the Nestle Website: COMPLEAT® PEDIATRIC Formula is the only blended pediatric tube-feeding formula \(not for oral consumption\) that includes traditional foods, such as chicken, fruit, cranberry juice and vegetables. It provides 250 kcals, 9.4 grams of protein and plenty of calcium in every 250mL serving. \[www.nestlenutritionstore.com\]\(http://www.nestlenutritionstore.com\)](#)

1 month later: LH is no longer retching with tube feeds, stools have improved in consistency, and nasal congestion has stopped. She is beginning to swallow small amounts of meltable solids and purees.

## Feeding therapy:

1. Begin structured behavioral "dry spoon" program to teach LH to consistently open for the spoon.

- During our first session, it was clear that LH understood cause and effect and could participate in the program. She opens her mouth consistently for the dry spoon but her tongue was humped and she did not close her lips. We presented the spoon at an angle to encourage a chin tuck and lip closure with success. We then added a small amount of puree to the spoon, which she rejected by turning away, holding her tongue back in her mouth and verbally protesting.

\*\*\*[\(LH is having trouble taking puree and does not know what to do with it in her mouth. Starting therapy with chewing is too hard a step for her. She needs to build some success with easier steps such as dry spoon, and easier foods such as purees\)](#)

Home program was started with dry spoon 2-3X/day for 10 minute practice session. **Plan:** Therapy will teach LH to take a dry spoon and then transition to volume and variety of purees. With consistent intake of purees, we can begin to transition to more time off of the tube. After some practice time and success with purees, we can then begin work on taking textures, and chewing.