



Pediatric Feeding and Dysphagia

Dear Fellow Feeders;

Welcome to the second issue of our second year. This month we've tried to offer a variety of topics that I hope you'll find interesting. Spanning from a review of where the norms we all use actually came from, to thoughts on preterm oxygen saturation, to recommending a good read on pediatric GI issues, as well as a few others.

As I was putting together the finishing touches on this issue and deciding what words to write here, it's difficult not to mention what's going on in the world. I would like to extend a sincere thank you to all of

the guest writers for getting their articles to me during this difficult time.

I believe we all have been touched in some way by the recent tragedies and we here at Hiro Publishing want to extend our deepest sympathy and warm wishes to all who have been affected.

I have received several questions for the Q&A section and have enjoyed seeking out experts to answer them. I want to encourage readers to email me with topic ideas, questions, suggestions, or comments. Send all correspondence to

Typical development of feeding & swallowing skills: Should we care?

Jacki L. Ruark, Assistant Professor, University of Central Arkansas.

As an undergraduate student in speech-language pathology, I was required to take a number of courses on normal processes (e.g., phonological development) before I was allowed to take courses regarding "disordered processes" (e.g., articulation disorders). This did not make me happy at the time; obtaining information about individuals with disorders was way more exciting than information regarding the typical population. Although my professors maintained that I needed to know what is "typical" to distinguished "not typical", I still could not wait to be finished with "normal" courses.

Now that I have been practicing as a speech pathologist for 18 years, I long to have available more hardcore information regarding normal, typical processes, especially in the area of feeding and swallowing development.

Development of feeding and swallowing in humans encompasses several

pertinent and related areas, such as, (1) development of motor control, (2) development of the size and shape of the individual structures involved during these activities, (3) the effect of development of one structure on another, (4) development of utensil use, and (5) development of the ability to consume certain food textures. Many articles and book chapters discuss these topics. Sadly, there is little research to validate their claims.

I recently gave a graduate student the job of performing an extensive literature review to determine where norms for feeding development originated. One goal was to find documentation of original research that was performed to determine the specific ages in which young infants are able to consume various food textures. The student spent many months on this project and found that most sources (e.g.,

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Editorial assistance provided by Elizabeth Crais Ph.D. CCC-SLP, Division of Speech and Hearing Sciences, UNC-Chapel Hill.

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Typical development of feeding & swallowing skills: Should we care? Jacki L. Ruark, Assistant Professor, University of Central Arkansas.

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medical journals, journals in psychology) quoted one another regarding developmental norms. No article presented information, or data that came from original research endeavors. Therefore, it remains unknown (at least to me) who determined when certain food textures are deemed appropriate (i.e., safe to orally manipulate and swallow) for specific developmental ages and what research methods (e.g., observational research, physiological research) were used to make such important decisions.

The findings of recent studies have brought into question developmental norms that we commonly use to determine if an infant or child feeds appropriately for his or her age. For example, Hunt and colleagues (2000) found that infants and young children acquire the ability to drink from a straw much earlier than once thought. Other studies have found that typically developing children may acquire the ability to orally manipulate solid foods more efficiently during early development than purees (e.g., Gisel, 1988). These studies, as well as others, bring into question what we as therapists take into account as typical feeding and swallowing development, and illuminate the need for additional research in typical infants and children.

Studies that have specifically focused on the development of swallowing have primarily addressed the coordination of swallowing with sucking and breathing in infants (e.g., Bamford et al., 1992). Thus, the effects of bolus variables, such as bolus consistency and volume, on swallowing in typically developing infants and children are not well understood. Moyers (1971) reports that a mature swallow is established by 15 months of age. Although Moyers states that physiological measures were used to obtain such information (e.g., jaw muscle activity in infants was recorded using electromyography as the infants sucked on a bottle), it remains quite unclear how the data were obtained (e.g., type of electromyographic analysis used to quantify muscle activity), and who the data were obtained from (description of participants). It is clear, however, that this manuscript suggests that swallowing in young infants is similar to adults. As neuromuscular and musculoskeletal systems in humans change dramatically between birth and 11 years of age, it is possible that the motor control for swallowing may change with development. A better understanding of swallowing and feeding development in infants and young children is necessary to determine when children should develop a more mature pattern and when the absence of a mature pattern should be-

come a concern (Ruark et al., in press). I am certain that the developmental norms for feeding and swallowing were established during a time when it was difficult to obtain physiological data from typically developing infants and children. With the new exciting technology that is available to us in the 21st century (e.g., ultrasound), perhaps it is time to revisit, and retest, the norms that we use to determine if an infant or child exhibits a delayed, and/or deviant, feeding and swallowing pattern.

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Intensive Feeding Programs

The Feeding Evaluation Clinic

Located: The Penn State Children's Hospital,
Hershey PA

Phone: 717-531-7117

Fax: 717-531-0720

Web: Feedingprogram@hmc.psu.edu (great web site!)

Director of Feeding Program: Keith Williams, PhD.
Medical Director: Douglas Field, M.D.

Mission: To provide diagnostic and treatment planning for children whose congenital or acquired medical issues or behaviorally based impairments, have affected feeding.

Team Members:

- behavioral psychology
- occupational and speech therapy
- nutrition
- feeding therapy/referral coordination
- gastroenterology

Referral Process: Caregivers first fill out a screening form (which can be downloaded) to determine which specialists need to see the child. Then, children are scheduled for a clinic appointment. Appropriate referrals include: food refusal, food allergies, dysphagia, food selectivity (texture and type), vomiting, FTT, constipation, mealtime tantrums, oral motor deficits.

Feeding Services:

1. Feeding evaluation clinic
2. The intensive treatment program
3. The oral motor clinic
4. Outpatient feeding therapy

Feeding evaluation clinic: appointments last 1-2 hours and the child's medical, feeding, and developmental histories are reviewed with the caregivers. The Pediatric Gastroenterologist may conduct a short exam. The child is weighed and measured, a feeding observation is conducted. The goal of the evaluation is to diagnose feeding problems and related medical problems, then initial feeding plans are developed

Day Treatment: This was developed as an alterna-

tive to in-patient admissions. Intensive day treatment is offered for those patients who do not require medical monitoring overnight. Most children will receive 4-8 feeding sessions per day (typically 20-35 minutes) and are fed by a therapist or caregiver if parent is being trained. Between feedings, the child may receive additional therapies for oral-motor or behavioral issues. There is a playroom and a nap room on the facilities. At the end of day treatment admission, a home visit is conducted .

How long is the average stay for day treatment: This length of treatment depends on the severity of the feeding problem. Average stay is about 25 days.

Lodging: Can be arranged at a Ronald -McDonald house across the street from the hospital or hotel/motels in the Hershey area.

Parent Training: The feeding therapist conducts the feeding during the first couple of weeks, although parents can watch through one way glass. Parents will be trained to follow the protocol and will implement the protocol on weekends (after a few weeks). Transfer to home is helped with a home visit.

What to Bring: The Feeding Program provides all of the food, formula, feeding supplies, and adaptive equipment for feeding as well as reinforcers to be used in the meals. Caregivers should bring medications, diapers, clothing and favorite toys.

The Oral Motor Clinic: Children will be observed eating a small meal. Problem solving is done regarding how to make mealtimes easier. Frequent topics include chewing effectiveness, swallowing safety, positioning, food textures, self-feeding techniques, and growth patterns. Before leaving parents are given a home program outlining:

1. oral exercises that promote age appropriate feeding
2. Suggestions on therapeutic feeding techniques
3. Nutritional recommendations for special food textures or special foods needed to optimize growth.

Outpatient Feeding Therapy: Whenever possible children are seen on an outpatient basis. The goal of outpatient feeding therapy is to develop and implement an effective home based feeding program. Frequency is based on individual needs.

Feeding Program Research: Comparison of eating behaviors between children with and without autism.

Books: Pediatric Functional Gastrointestinal Disorders edited by Dr. Paul E. Hyman, MD

Hyman, Paul E., ed. (2000). *Pediatric functional gastrointestinal disorders*. New York: Academy Professional Information Services, Inc.

For those readers interested in getting an in-depth look into functional GI disorders in the pediatric population, this is the book. It's structured into 12 chapters with appendices covering the following topics; biopsychosocial model of practice, infant colic, regurgitation, nonorganic FTT and rumination, cyclic vomiting, visceral pain, abdominal pain, pain syndrome, diarrhea, pelvic floor syndromes, functional GI disorders in adults and kids, Q & A, and diagnostic criteria. .

While it is technical and written for health-care professionals, don't be intimidated by picking up a serious GI text. Certain chapters are more relevant for feeding therapists than others and provide depth and understanding to the GI issues many of our patients face. Topics such as infant colic, regurgitation, FTT, cyclic vomiting, and visceral pain are areas to explore and understand.

For example, information given includes that many preterm infants have delayed duodenal

motility which contributes to reflux and vomiting. In addition, the relationship of visceral pain and food refusal is discussed. As stated in chapter 6, there are complex interactions between neural pathways and the perception of pain. Not only may abnormal neural mechanisms cause pain, but also pain itself may cause abnormalities in neural development. The clinical implication for children with intestinal dysmotility and pain is that unless the pain is adequately addressed and reduced, pathologic persistent pain can develop and be perpetuated. Since the pain is no longer simply generated by motor dysfunction, correction of the intestinal motor pattern alone may not relieve the pain. The author goes on to explain that pain itself can alter motility and a cycle of visceral pain and abnormal motor patterns may be established.

Can you explain infant colic, gastroesophageal reflux, and delayed motility? How milk protein allergy manifests? The difference between rumination, vomiting, and regurgitation? After reading this book, you'll be able to do so. While this is not a text about feeding, the influence these subjects have on feeding and oral acceptance is crucial to our understanding and therapeutic interventions. I highly recommend this book!

Shaker Exercise: Therapy For Reduced Upper Esophageal Opening

This therapy technique was originally developed by Reza Shaker, MD, a gastroenterologist from the Medical College of Wisconsin. It promotes suprahyoid, infrahyoid, and sternocleidomastoid strengthening, creating greater anterior laryngeal motion aiding the opening of the upper esophageal sphincter (UES). **The exercise consists of the following techniques:**

Lie down flat on a comfortable surface. Pull the head up from a relaxed position until the chin touches the chest. Hold for one full minute, then relax again for one minute. Do this three times. Following this 6 minute sequence, do thirty head raises without the one minute interval. This entire sequence should be done three times a day for a minimum of six weeks.

How do we know the exercise works? There have been several published studies testing the technique. In 1997, Dr. Shaker tested his technique using 31 normal adults divided into either a test group or sham group. Results indicated that the test group had significantly increased their

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A significant clinical problem for very low birth weight (VLBW) infants during early feeding is their coordination of suck-swallow-breathe mechanisms. When breathing pauses become prolonged or when breathing periods between sucks are inadequate or interrupted, infants' oxygenation may decline. Oxygen decline is referred to as oxygen desaturation. Recurrent episodes of desaturation, such as may occur through repeated feedings throughout the preterm infant's day, may affect cardiac and pulmonary function, impair preterm infant growth, and may alter cerebral oxygenation. In addition, lower oxygen levels may contribute to fatigue and early cessation of feeding. These infants often present as infants who do not have the energy to eat, those who tire easily, or infants who do not take in the full volume of feedings prescribed.

Oxygen saturation is a measure of the amount of oxygen in the infant's tissues. It is measured by pulse oximetry with a sensor typically placed around the infant's foot. Oxygen levels are reported as the SpO₂ with normal ranges of 93-100% saturated. Most nurseries set their pulse oximeters to alarm if the SpO₂ drops below 90%.

Feeding conditions and the infant's level of health alter the risk for desaturation during feeding. There is a greater incidence of oxygen desaturation during bottle feeding than during breast or gavage feeding. Infants who are bottle fed while they have an indwelling nasogastric feeding tube have more prolonged and more severe oxygen desaturation events. Infants with cardio-respiratory conditions (such as chronic lung disease or congenital heart disease) have a greater incidence of desaturation during feeding. In addition, infants with lower baseline SpO₂ at the beginning of feeding (less than 93%) have lower mean SpO₂ during the subsequent feeding and a higher percent time of the total feeding time with oxygen below 90%.

Although little is known about how long preterm infants continue to have desaturation events associated with feeding post-discharge, it has been found that preterm infants with chronic lung disease and infants with persistent apnea continue to have significant hypoxemia during feeding through 3 months post-term age. In addition,

it is important to remember that preterm infants have moved toward discharge at an earlier post-conceptual age (PCA). During the age preterm infants are being discharged (now as early as 35 week PCA), preterm infants vary in neurophysiologic control of breathing, ability to safely and efficiently swallow, and ability to adapt to the demand that an activity such as oral feeding requires.

Recently we studied the amount and severity of oxygen desaturations during a bottle feeding that the mother provided near the time of discharge from a NICU. We studied 22 VLBW infants who were free of cardiac conditions, brain injury, or conditions that would interfere with feeding. One-third of the infants had chronic lung disease and approximately one-third of the sample were receiving supplemental oxygen.

We found that infants have frequent and significant oxygen desaturation events during bottle feeding near the time of discharge from the NICU. On average, infants spent 19% of their feeding time with SpO₂ levels considered subclinical (<90%). Most desaturation events were mild, however, greater than 40% were moderate to severe (<85% SpO₂). The first minute of the feeding was the most vulnerable for desaturation events. However, when each infant's feeding was divided into thirds, desaturation events were fairly evenly distributed with slightly more events occurring during the final third of the feeding.

Most desaturation events occurred during bottle-in-mouth periods, however, 37.8% of the events occurred after the bottle was removed, i.e., during a feeding break. Many of these events were related to the previous bottle-in-mouth period. For example, mothers removed the nipple when they noted that their infant had not been breathing adequately, the SpO₂ was decreasing and a desaturation event ensued. Interestingly, mothers often resumed feeding their infant before the infants' SpO₂ had fully recovered to the prefeeding baseline level.

A greater percent of time during feeding with low oxygen was more often found in infants who did not receive supplemental oxygen during the feeding, had lower baseline SpO₂, were bottle feeding at an earlier PCA with less experience bottle feeding, and had a history of fewer days on oxygen and greater birthweight. Supplemental oxygen may have protected these infants from significant number and se-

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Case by Case....



Name: Bailey
Diagnosis: Fetal Alcohol Syndrome

Age: 3 years, 6 months
Referred: for no oral intake

Background information: Three weeks premature, one week in the NICU before going home. Initially, Bailey took a bottle, but was frequently irritable and refused feeds. She never transitioned onto baby foods or table foods. She was hospitalized due to failure to thrive at 18 months old at which time a g-tube was placed and nissen fundoplication was performed. Oral intake consisted of ice and a few spicy crunchy foods which she would eat inconsistently. She receives her nutrition from Pediasure via night-time drip feedings.

Oral Motor: Normal ROM and adequate strength; normal tone; bilabial sounds, 10 word repertoire.

Eating and Swallowing: Able to manage secretions well. She mouths a variety of objects. She demonstrates a rotary chew with ice, her preferred food.

Sensory Integration: Demonstrates tactile defensiveness and gravitational insecurity. She sees an Occupational Therapist who specializes in Sensory Integration weekly.

GI Issues: Daily emesis, retching, sensitive to smells, bad breath, nasal congestion.

ENT: Adenoidectomy and PE tubes placed at 18 months old.

Pulmonary: Underwent open heart surgery at 6 months of age to correct atrial and septal defects. Scar is evident in her ribcage area.

Behavior: Tolerant of a variety of interventions; eats inconsistently and not enough to sustain and grow; demonstrates GI discomfort throughout the day.

Intervention 1

1. **Oral motor feeding therapy** Bailey had been receiving therapy once a week for 60 minute sessions focusing on increasing oral sensory tolerance for textures with the use of a Nuk brush and tactile activities with rice and beans. Result: No change in Bailey's food acceptance after 6 months.
2. **GI Intervention:** after 6 months of no progress a GI doctor was consulted to intervene with gastroesophageal reflux management. Bailey was put on Prilosec to block acid and Reglan to improve motility. Result: No change in eating behaviors and no change in pain. A formula change was tried, a trial of Pep-tamum jr. was conducted which resulted in increased emesis by report from her parents.

Intervention 2

1. **GI Intervention:** gastroesophageal reflux medications were changed to Donnato, a muscle relaxer, and Megase, an appetite stimulant. Reglan was discontinued due to lack of motility problems.
2. **Behavioral:** Therapy was increased to 2 times a week for 60 minute sessions. A reward system was set up during feeding therapy sessions to motivate Bailey to tolerate first an empty spoon, then a spoon dipped in puree, and then a spoonful of puree in her mouth. Initially Bailey would tolerate 5 empty spoons then take a play break. Later five dipped spoons preceded a play break. To introduce a full spoon, Bailey would tolerate only one full spoon and then a motivating play break.
3. **Oral motor:** Activities such as Nuk brushing and tongue lateralizations in front of a mirror were used as a warm-up for the structured feeding program.
4. **Ribcage/Pulmonary:** ribcage mobilization, stretching and ball activities were incorporated to improve ribcage excursion and support for breathing.

Result: Increased incidental intake during home mealtimes. Bailey tolerates up to 30 full spoonfuls of puree per therapy session. She drinks water and juice from an open cup throughout the day. Emesis and retching subsided.

Long-term goals: Initiate structured feedings during select times with Mom at home.

1. Increase acceptance of Pediasure from a cup via structured feeding method to increase oral intake and decrease g-tube feedings.
2. Structure feeding sessions so that Bailey will take one full spoon then a sip of Pediasure. Eventually fade out play breaks.

Bottle Feeding the Preterm Infant: Are They Starving for Oxygen?

Suzanne M. Thoyre Ph.D., RN

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verity of oxygen desaturation. Alternatively, infants who were requiring supplemental oxygen may have been considered more vulnerable to hypoxemia by their mothers and were then fed with closer monitoring of oxygen status.

The quantity and quality of infant breathing that occurs during feeding is likely to be the meaningful component of preterm bottle feeding to monitor. In a secondary study of infant behaviors that occurred prior to and during the desaturation events we found that apnea commonly preceded desaturation events. We are currently pilot testing an intervention aimed at minimizing oxygen declines by enhancing the feeder's assessment of infant breathing during feeding. We recommend that all preterm infants be monitored with pulse oximetry during oral feeding until the infant has been found to consistently maintain oxygenation throughout the demand of oral feeding. In addition, supplemental oxygen may be required of more preterm infants than is current believed and warrants further study.

For references and correspondence: Suzanne M. Thoyre, PhD, RN, School of Nursing, CB 7460 Carrington Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7460. Phone: (919) 966-8418. Fax:(919)843-9969. Email: thoyre@email.unc.edu

Observations Regarding Pacifiers and Oral Motor Development

Debra A. Beckman, MS, CCC-SLP

Are pacifiers good or bad? It depends on how the pacifier is used. From the first trimester in utero, until the end of our lives, each of us continues to seek oral stimulation – for comfort, for sustenance, or out of boredom. For babies who have reflux (GERD), sucking and swallowing can provide some relief when reflux occurs. The saliva combats the stomach acids, and the peristalsis combats the reflux. For these babies, a pacifier is important. Other babies may have a strong need for oral stimulation, and crave constant input. Take away the pacifier, and a mighty outburst will follow which disturbs the care givers. Still other babies have impaired oral skills, and cannot vary the movements that they use. They use a pacifier because the skills needed for other activities with the mouth have not developed.

As the baby matures, input to the mouth changes from anterior, midline to posterior, lateral, as the baby changes skills from sucking to chewing. The increase in jaw stability (strength) is an important step toward tolerance of increased food texture and toward the jaw stability necessary during speech. During non-nutritive sucking on a pacifier, the jaw shows minimal movement and the tongue often protrudes over the lower lip, under the pacifier nipple during sucking. If the pacifier fills the mouth the majority of waking and sleeping hours, there is reduced opportunity for the development of oral patterns that are more posterior and lateral. Some pacifiers are designed with a large rounded shape on the top and a wide flat surface on the bottom. The tongue is then maintained in a habitual position down and forward, extending out between the gums or teeth. This design further limits the variety of tongue movement possible during non-nutritive sucking, as compared to those pacifiers that have a shape that is rounded on all sides.

The goal is to provide a variety of movement opportunities to build a variety of oral skills. A variety of oral input is desirable. As the infant places different items in his or her mouth, including fingers, thumbs, toes, toys, clothing, etc., the variety of movements increase. This enhances improved control for oral structures so that the next level of skills can emerge and

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Observations Regarding Pacifiers and Oral Motor Development

Debra A. Beckman, MS, CCC-SLP

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develop. So, if the pacifier is used infrequently, with ample opportunity for the baby to explore the world orally, then the use of a pacifier is no problem. However, if the pacifier is in the baby's mouth the majority of all waking hour and for hours at night, then important opportunities for skill development are lost, and the use of the pacifier is a problem.

Summary: 1. Oral stimulation is needed. 2. Development occurs from anterior, midline (sucking) toward posterior, lateral (chewing) 3. Limited variety of movement limits development of oral skills. 4. Provide a variety of input to the oral area to enhance development of oral skills. 5. Use a professional model – assessment, plan, implementation, evaluation and monitoring – to direct intervention.

Contact Debra Beckman at : www.beckmanoralmotor.com, Beckman & Associates, Inc. 1211 Palmetto Avenue, Winter Park, FL 32789, phone 407-647-4740

Q and A: Do you have any ideas for FTT secondary to hypersensitivity and food refusal?

Our question is answered by Dr. Paul E. Hyman, Professor of Pediatrics, Chief, Pediatric Gastroenterology, University of Kansas Medical Center, Paulhyman@aol.com

What is the meaning of "hypersensitivity"? Do you mean a generalized sensory sensitivity like in Turner's syndrome or autism? Or does the question refer to food hypersensitivity/allergy?

In general, toddlers refuse to eat because it hurts to eat or they are afraid that it will hurt to eat because of past experiences. It is our task to figure out why eating has become a dysphoric experience, and then treat according to the underlying causes. We've learned that up to half the children treated with an excellent behavior modification program learn to eat. The other half fails to learn to eat with behavior modification alone. I hypothesize that the failure of behavior modification is because of underlying and persistent pain with eating.

Usually the medical history provides clues to why eating is uncomfortable. Preterm infants whose early oral experiences were always painful develop a hyperalgesia in the oral area, which may spread over other parts of the body as the brain matures and the neuroplasticity that characterizes the perinatal period sensitizes other areas. Similarly, needles, tubes and pokes all over may result in a generalized sensory sensitivity. Children are sometimes born with a sensory sensitivity. Sometimes the sensory sensitivity is associated with a recognizable syndrome, like Turner's, but sometimes not.

Sometimes underlying gastrointestinal motility disorders cause pain and other symptoms, but go unrecognized for years. Sometimes the dysphoric eating experience is related to an impaired caregiver-infant-toddler relationship. Caregiver/infant temperaments clash and result in discomfort to each one in the dysfunctional dyad.

In order to figure out the child who won't eat, but who is otherwise well, it may be necessary to assess motility, sensory, and arousal factors. Treatment will be based on what is wrong.

Toddlers with a generalized sensory sensitivity respond to multidisciplinary treatment designed to reduce arousal (calm parents and staff, drugs to improve sleep patterns, reduce impulsivity), decrease chronic pain (tricyclics, gabapentin), and put good sensations in (massage, music, etc).

Keep routines and schedules. Reward incremental improvements (behavior modification.). In patients with gastric hyperalgesia, a 6 to 8 week period of gastrojejunal tube feeding (in those who already have G-tubes) may desensitize the stomach by keeping it empty for a couple of months. Megase may be used as an appetite stimulant, and works for about 80% when used a part of a multidisciplinary team approach. (Cyproheptidine works for about 1 in 3, but never as well as Megase.) Don't give up, but stay with the program.

On the Research Front:

Benoit, D., Wang, & EL, Zlotkin, SH. Discontinuation of enterostomy tube feeding by behavioral treatment in early childhood: a randomized controlled trial. *The Journal of Pediatrics* 2000; Oct: 498-503.

The objective for this study was to determine whether behavioral therapy was more effective than nutritional therapy in obviating the need for enteral feeding in infants with resistance to feeding. A frequent complication of tube feeding is oral aversion or resistance to oral feeding. While a variety of techniques are used (reinstating hunger cues, feeding reflexes, oral motor skills, caregiver's attitudes) to remediate feeding skills, outcomes are inconsistent and variable.

In this study, 64 children (4 – 36 months) who were tube fed and had a resistance to oral feedings were randomly assigned to either behavioral or nutritional interventions. For 7 weeks, subjects and feeders attended a weekly clinic with 1-2 dieticians followed by 4 follow-up visits. The nutritional intervention provided structured schedules and routines to stimulate the hunger/satiety cycle. The behavioral intervention provided the same schedules and routines plus behavior therapy (extinction). Extinction is defined as removing the reinforcer to a response to decrease the occurrence of this response. In this study, extinction consisted of placing a small amount of food directly on the mouth which often triggered an anxious response. The feeders reassured the infant but continued to place food on the lips or mouth every 5-10 seconds despite the distress. If food was not swallowed then a dry spoon was used.

The primary outcome measure was the proportion of successes, defined as infants no longer requiring tube feeding at the 3rd follow-up visit in each group (4 1/2 months after the start of the trial). Results indicated that 15 (47%) of 32 subjects in the behavioral group vs. none in the nutritional group were successes. In conclusion, behavioral therapy is more efficacious in eliminating the need for tube feeding than nutritional counseling alone. The authors stated that due to the brief nature of this study, long term effects could not be examined.

Thoughts: An important point from this study is that simulating satiety/hunger cues did not appear to influence oral aversion or food acceptance. How many times have we tried to put kids on bolus feeds so that they will get hungry and eat? The feeders used extinction which appeared to be a forceful technique. It increased intake in 50% of subjects, what about the other 50%? See Dr. Hyman's answer in the Q & A section for more thoughts on why kids don't eat. I think this study is extremely interesting and valuable. We need to start chipping away at our therapeutic interventions to determine which techniques are successful.

Shaker Exercise: Therapy For Reduced Upper Esophageal Opening

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anterior laryngeal excursion and upper esophageal opening. Caryn Easterling, a SLP at the Medical College of Wisconsin, Milwaukee, WI (2000) looked at tube fed adult subjects with dysphagia. Again, groups were divided into a test group (doing the Shaker ex.) and a sham group. Data collected indicated that 16 out of 18 subjects in the "real exercise" group recovered safe swallowing function and were able to return to an oral diet with the last two subjects returning to a partially oral diet. The "sham exercise" group showed little or no recovery of safe swallowing ability and remained tube fed for nutrition. A 3rd study, examined which muscles were strengthened during the exercise by identifying the muscles that fatigued with SEMG. The muscle groups identified were the suprahyoid, infrahyoid, and sternocleidomastoid muscle groups (Ferdjallah et al., 2000)

This technique can aid bolus propulsion through the UES without leaving residual pooled material within the bilateral pyriform sinuses, which can create a risk for post-swallow aspiration. The transit of the bolus into the UES is further promoted by the hypopharyngeal suction pump, (negative pressure within the UES described by Cerenko, McConnell, and Jackson, (1989) which helps to pull the bolus

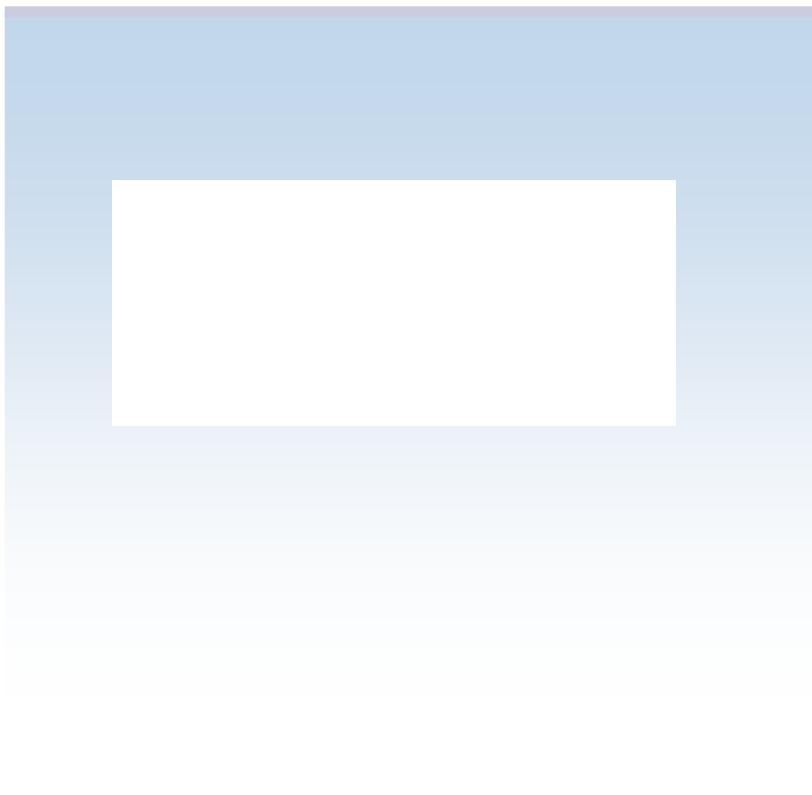
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**Special for Feeding Therapists and
Professionals!**

Questions, comments, sub-
missions, and suggestions
are all welcome. Please be
vocal, the hope is that this
forum will be educational
and will help to connect us
as professionals working to-
gether.



Shaker Exercise: Therapy For Reduced Upper Esophageal Opening adapted from an article by Brian Kanapkey MS SLP/CCC

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into the upper esophagus.

How do we adapt this for kids? It can be easily used with children who are school age or older. A modified version can be adapted for younger kids who can not follow commands or who are developmentally delayed. Place the child in a supine position on the floor, hold the arms straight down by the side and guide the patient to pull up with the head first, have a motivating toy or person that the child wants and when the child gets up, hold them so that they lead with the head. It can also be done on a roll or ball.

Thus far, research on this technique has been encouraging and provides us with an inexpensive and relatively simple exercise to use in an area that is difficult to isolate.

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