



Pediatric Feeding and Dysphagia

Dear Fellow Feeders:

Welcome to the first edition of the Pediatric Feeding and Dysphagia Newsletter! For those of you who don't know me, I am a speech-language pathologist at UNC Hospitals and I have been coordinating services for our pediatric feeding and swallowing patients for the past five years.

I had the unique opportunity of starting the program at UNC with the assistance of a grant and was able to visit other programs and specialists to compare notes before setting the wheels in motion here. It was slow going at first but our program has grown and expanded year by year.

Recently, I was asked a question, "what do you read to stay current?" That question sparked a series of thoughts for me that has led me here. As you know, there is no one source for information pertaining to pediatric feeding and swallowing.

Gastroesophageal Reflux: Presenting Symptoms

Gastroesophageal reflux or GER is defined as the effortless regurgitation of gastroduodenal contents into the esophagus and above. Research identifies three classic symptoms as regurgitation, esophagitis, and respiratory problems such as apnea, stridor, and aspiration.

In his 1994 article, Dr. Hyman stated

There are so many components such as neurology, GI, pulmonology, nutrition, psychology, speech, occupational, and physical therapy, neonatology, pediatrics, and ENT just to name a few.

This is a complex, challenging, and fascinating area to be working in! There is nothing as rewarding as teaching a caregiver how to more effectively feed his/her child. In this age of changing healthcare, billing demands, and cost restraints, many of us feel isolated. We are being asked to do more with less.

This is my attempt at bridging the gap, to provide a forum to share knowledge, successes, and frustrations. I welcome comments, suggestions, and feedback. Enjoy!

- Krisi Brackett M. S. CCC/SLP

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Special points of interest:

- ☉ Current information
- ☉ New products
- ☉ Research and publications
- ☉ Education

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GER: Presenting Symptoms

One of the primary issues facing professionals is how do you distinguish pathologic reflux from non-pathologic reflux? The most important consideration is whether the child is gaining weight and growing appropriately. Secondly, are they getting appropriate nutrients and calories for their age and development? Thirdly, is the child having pulmonary systems (aspiration, apnea, etc.)?

Physicians vary considerably in their approach to the diagnosis and treatment of reflux. One may choose to treat empirically with medication, another will order tests, or you may hear that the child will simply grow out of it.

Reflux can affect the meal itself in many ways. It may cause the child to become irritable from discomfort or arch/hyperextend in an effort to relieve pressure on the stomach. Some children will avoid textured or lumpy foods, become "gaggy", or have excess drooling. Hypersensitivity may be related to diffuse vagal nerve pain or the feeling of "a lump in the throat." Drooling or saliva production is the body's physiologic response to acid. Saliva contains bicarbonate which helps to neutralize acid.

Pain from reflux can also contribute to behavioral feeding problems when children start to associate pain with eating. Typical responses include food refusal, selective or picky eating, and texture or volume limitations.

We must learn to recognize the symptoms of GER. Specifically, for the subtle refluxer who may be growing but having difficulty with feeding or showing signs of delayed prone, chewing, and trunk rotation skills. We must begin to look at the whole body when treating to ensure successful and lasting intervention. How do we do this? By educating

ourselves! Read articles, spend time with other clinicians, or attend GI visits with your patients. Try developing a list of soft signs and symptoms of GER and start asking questions during your case history, pay attention to subtle changes with intervention. Time will tell. (references page 3)

Case by Case...

Kate is a two year, five month old female with spastic quadriplegic cerebral palsy, mental retardation, VP shunt, developmental delay, and failure to grow. She came to UNC for a feeding evaluation, in her family's hopes of avoiding a nissen fundoplication and g-tube.

Her history includes being the 900 gram product of a 26 week gestation complicated by grade IV IVH, cortical blindness, and cocaine addiction. She has head control, rolls from side to side, and is able to bear weight with assistance.

At the time, her diet was Pediasure and high calorie purees (named "gorp" by Mom). Feeding was characterized by decreased intake, an immature oral motor pattern (suckle), and daily emesis with meals. Her weight was approximately 5 lbs. below doctor recommendation. Her Mom was feeding her around the clock to increase her weight without success. She was feeling desperate and helpless.

The first intervention we made was to maximize oral motor skills by adding cheek and jaw support and trying various nipples. Kate was still drinking from a bottle and the decision was made not to change this because it was her main source of nutrition.

Other oral-motor recommendations included lateral placement of purees and deep pressure midline placement with spoon feedings as well as an ENT referral for evaluation of large tonsils. Lateral place-

ment of purees and deep pressure spoon placement were aimed at transitioning Kate's suckle pattern to a suck and eventually to obtain more tongue movement.

Kate had recently been placed on GER medication; Reglan, a motility agent, and Zantac, an acid blocker. After a 3 week trial on the medication with little change, a trial of a formula change was initiated. Kate was changed to Peptamum jr., a whey based toddler formula (30 cal/ounce). This nestle made formula is often easier to digest than regular casein and whey formulas but not all oral feeders will drink it. Fortunately, Kate had no trouble adjusting to the new taste.

In conjunction with her pediatrician, Malox was added to ease stooling. The amount of pureed food was decreased while the formula (easier to digest) was increased. A gastric emptying study was ordered to assess stomach emptying time and to rule out GER.

It's now been 6 months and Kate is showing no emesis unless sick, less crying and irritability, and is slowly putting on weight. Her Mother's goals for the future include increased weight, transition to cup drinking, and eventually chewing. She has not reached her goal weight yet but with the doctor's blessing we have time and Kate's progress to keep going!

Aha (FYI stuff): The Pigeon Bottle

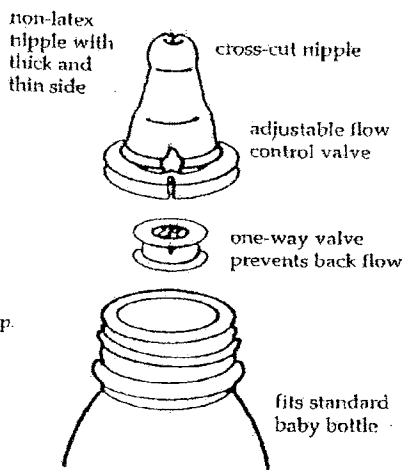
This is a special cleft palate nipple designed by a Japanese company called the Pigeon corporation. We've nicknamed it affectionately "the pigeon bottle."

What makes it special is the design itself. Made of non-latex material, the top half of the nipple is firm, providing stabilization in the infant's mouth and assisting closure of the cleft. The bottom half is softer and more pliable allowing the baby to extract liquid with compression provided by tongue movements. A valve located at the base of the nipple helps maintain continued milk flow into the nipple and an air hole at the top decreases extra air ingested by the infant.

The nipple is cut in a Y shape which lets slightly thickened liquids pass through without altering the nipple shape and integrity.

This bottle differs from other cleft bottles on the market because it is not a squeeze bottle. Once the nipple is positioned correctly in the baby's mouth, he or she does all the work.

Parent's like this bottle for several reasons. The main attraction is its



The cleft palate nipple system

appearance, it looks like a normal bottle. The special nipple and ring fit on most bottles. The second reason is the price. It sells for approximately \$3.00 per nipple or \$7.50 for a set of two nipples and bottle.

Who should use it? Definitely your patients with a diagnosis of cleft palate. We have had success using this with infants with a variety of craniofacial disorders and with infants who have a weak suck or poor endurance such as preemies or infants with cardiac problems. Watch the flow rate though, it can be fast! The nipple is large in size and may be too big for some

newborns. Some kids grow into it.

Pros: it's performance, price, and appearance. Cons: (1) in the past, ordering from Japan in yen, but Children's Medical Ventures (CMV) now carries them, (2) supplying families. CMV has a parent order line but they don't bill insurance/medicaid. We buy them, supply families, and then bill for them.

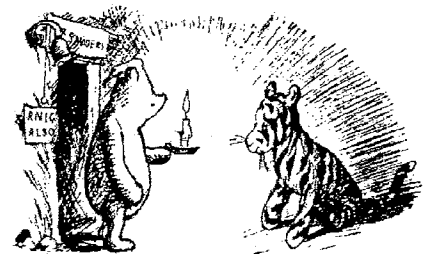
Where to get the pigeon bottle? Children's Medical Ventures, call them at 1-800-766-8443 for a catalogue.

Quotes (we wish our kids were Tiggers)

"Well," said Pooh, "It's the middle of the night, which is a good time for going to sleep. And tomorrow morning we'll have some honey for breakfast. Do Tiggers like honey?"

"They like everything," said Tigger cheerfully.

-The House at Pooh Corner



References from GER: Presenting Symptoms article (page 1-2);
 Hart, John J., Pediatric Gastroesophageal Reflux. American Family Physician 1996; 54: 2463 - 2471.
 Hyman, Paul E., Gastroesophageal Reflux: One Reason Why Baby Won't Eat. The Journal of Pediatrics 1994; 125:S103 - 109.
 Orenstein, Susan R., Infantile Reflux: Different from Adult Reflux. American Journal of Medicine 1997; 103 (3S): S114-S119.
 Putnam, Phillip E., Gastroesophageal Reflux Disease and Dysphagia in Children. Seminars in Speech and Language 1997; 18: 25 - 37.

Pediatric FEES: New ways to evaluate the swallow

The fiberoptic endoscopic evaluation of swallowing (FEES) has become an increasingly common and useful tool with the adult dysphagic patient. This technique, first described by Susan Langmore, SLP is now beginning to filter into the pediatric realm, especially with the neonates.

A flexible nasopharyngoscope is passed transnasally just past the soft palate to obtain a superior view of the pharynx and larynx. According to Willging (1995), "the endoscopic method of evaluating swallowing is limited to the events occurring immediately before and immediately after the swallow." Parameters evaluated include premature spillage, laryngeal penetration, aspiration, and residue.

When compared to the modified barium swallow study, the FEES appears more sensitive in the detection of abnormal pooling and residue after the swallow. It is equal in other parameters.

The procedure takes about 20 - 40 minutes and can involve nasal decongestants, topical anesthetic (not always), and medical play therapy.

Benefits include no radiation exposure, no time constraints, the ability to test sensation, and the potential for repeated exams. Another significant advantage is the ability to assess the airway at the same time. Disadvantages are the invasiveness of the procedure, inability to view the oral phase of swallowing, mild discomfort, and patient anxiety.

At UNC, we purchased a pediatric endoscope to use with our FEES

equipment (you need a camera, a light source, and video recorder). We have been performing adult FEES for several years and are comfortable evaluating independently. However, we are currently using pediatric FEES in conjunction with our ENT's.

It's proven the most successful and informative in our NICU allowing assessment at the bedside, the ability to use real formula, and the timeliness to assess at feeding times. We have found that if we let the child begin sucking on a gloved finger, insert the scope, and then feed, we have had successful procedures. We have also used FEES with toddlers and teens, although not without a few refusals.

It proved particularly useful with one 3 month old female who had

failed 2 MBSS's due to chronic aspiration. It was difficult to determine why this infant was aspirating on the MBSS but on the FEES we could clearly see a polyp located just above the UES that was funneling formula into the laryngeal vestibule. This was subsequently removed. A follow up MBSS, revealed normal swallow function. The FEES procedure is definitely earning it's place among dysphagia evaluations.

Miller, Claire. (1998) Use of Instrumentation Management Application of the FEES Procedure in Pediatric Patients. ASHA Convention, Institute #4.

Willging, J.P. (1995) Endoscopic Evaluation of Swallowing in Children. International Journal of Pediatric Otorhinolaryngology, 32, s107-s108.

Willging, J.P., et al. (1997) Lack of Effect of Fiberoptic Passage on Swallowing Function in Children. Poster Session at Dysphagia Research Society Meeting Oct. 16-18.

Conference Highlight: If You Can't Breathe you Can't Function

This course will challenge clinicians to look beyond their own specific discipline to acknowledge the unique importance of the pulmonary system in successful rehabilitation. It will describe how functional outcomes (improved vocalization, walking, coughing, etc.) and improved medical outcomes (decreased pulmonary complications) can be achieved by purposely using the pulmonary system as an asset rather than a liability. Through lectures, lab and group participation, all attendees will experience how to enhance overall motor performance and ventilation.

Course objectives include: comprehension of normal ventilation patterns and those seen with neurologically impaired patients, the ability to position and to move patients for optimal cardiopulmonary function,

perform techniques geared toward modifying inefficient breathing patterns or inadequate cough maneuvers, use soft tissue/joint mobilization and other handling techniques to enhance ribcage mobility and function, and integrate techniques into treatment plans.

** I took this course several years ago and found the information opened a new area of treatment to me with neurologically involved patients, it has proven itself invaluable! The importance of the coordination of feeding and respiration can not be underestimated.

Given by: Wake AHEC is sponsoring this course in Raleigh, 9/23-25/99, taught by Mary Massery, PT. It's limited to 25 participants, info can be found at www.wakeahec.org.

Books: Failure to Thrive and Pediatric Undernutrition

Failure to Thrive and Pediatric Undernutrition is a new book edited by Daniel Kessler, M.D. and Peter Dawson, M.D., M.P.H., which addresses this complex topic from a truly transdisciplinary approach.

Failure to thrive (FTT) or pediatric undernutrition means inadequate nutrition that impairs growth during the first 2-3 years of life. This deficit may be caused by a variety of factors and warrants assessment by a team of professionals.

This book is divided into sections focusing on nutrition, medical aspects of poor growth, child development, family and cultural issues, and policy and advocacy. Chapter authors address topics specific to their discipline but write in terminology that everyone can follow., thus bridging the gap between professionals.

Section I is introductory and provides a basic understanding including definition, terminology, and history. Sections II and III provide information on assessing underlying causes. Section IV focuses on child development; oral motor function and sensation, communication, and E.I. programs. Section V discusses cultural, family and mental health topics; while sections VI and VII broaden the discussion to the level of community service and social policy.

The etiology of FTT is diverse and actual prevalence is difficult to determine. It has been estimated that it occurs in 5-10% of children in both rural and urban settings and accounts for between 1% and 5% of hospitalizations

of young children.

FTT has traditionally been characterized as either organic or nonorganic. The authors suggest a more effective approach is the simultaneous assessment of risk factors in multiple domains. Several theories of possible causes are also discussed; such as emotional deprivation, underfeeding, and abuse.

In conclusion, this is a comprehensive effort helping to bridge the gap between the many disciplines assessing and working with these children toward a common goal. Take a look!

Published by:

Kessler, Daniel B. & Dawson, Peter., (1999) Failure to Thrive and Pediatric Undernutrition. Paul H. Brookes Publishing Co., Baltimore, www.pbrookes.com



On the Research Front... Feeding responses to free-flow formula in term and preterm infants

This 1998 study looking at term and preterm infant's responses to free flowing formula was conducted by Dr. Waltraud Schrank et al. from the Department of Pediatrics, Washington School of Medicine, St. Louis Missouri and the Department of Pediatrics, University of Warzburg, Germany. It appears in the *Journal of Pediatrics*, volume 132 (3) of March 1998, pp 426-430.

The objective of this study was to establish specific characteristics of the feeding response (sucking, swallowing, ingestion rate) to free milk flow. The authors stated that while introducing freely flowing formula into the infant's mouth is a common practice, its effect on feeding behavior is largely unknown.

The researchers hypothesized that infants will rapidly increase or decrease feeding activity to accommodate sudden changes in free milk flow. This was based on "active" and "passive" milk delivery systems. Bottle feedings are typically "passive" requiring suction and compression forces to elicit formula. In contrast, certain phases of breast feeding are "active" when increased pressure in the milk ducts causes milk to be expelled.

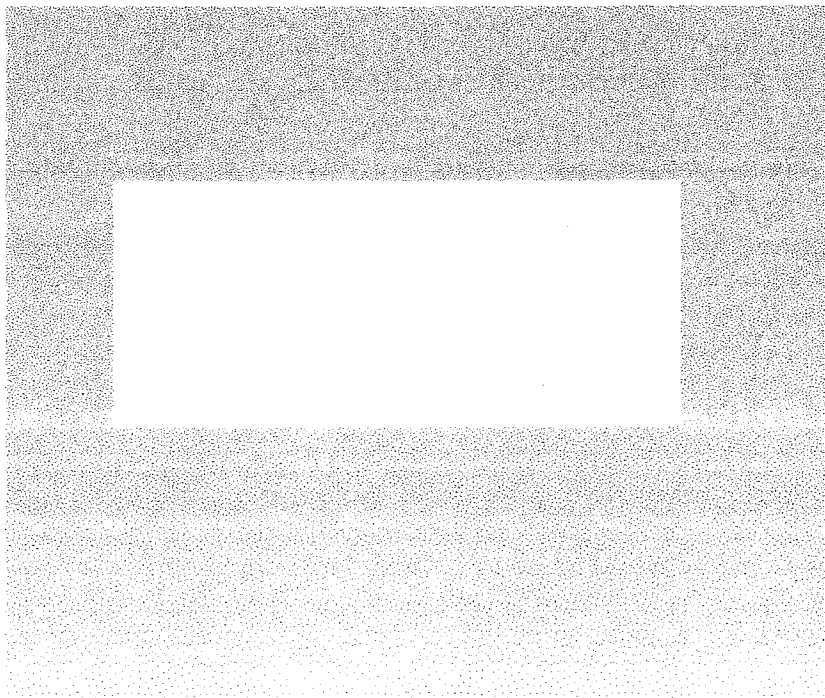
Thirteen preterm and seven term infants were studied during feeding. Bottle pressure was adjusted every 2 to 3 minutes to increase or decrease flow from nipple.

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On the Research Front...

(Continued from page 5)

Results indicated that increase in free flow of formula from the nipple caused rapid increases in suck swallow frequency in both sets of infants and increased ingestion rate. The response was reversed with a decrease in flow rate and was repeatable throughout the feeding. Peak suck and swallow rates were highest in term infants. Drooling increased with increased milk flow, there was no effect on coughing, restless behavior or apnea observed.

The authors discuss concerns that high flow rates may lead to airway compromise. Their observation of increased oral loss of milk (drooling) associated with high flow rates indi-

cates that the infant may use this when flow rate is above a level they can handle. They suggest that formula escape from the mouth while continuing to feed may be a sign of feeding competence, rather than incompetence.

Free flowing feeding systems (syringe, squeeze bottle, cup) are in wide use for infants with disabilities. While evaluating a small number of infants, this study shows that free-flowing feeding stimulates sucking and swallowing in term and preterm infants, increases rate of ingestion in term infants, and is reasonably well tolerated.

Waltraud, Schrank et al., Feeding Response to Free-flow Formula in Term and Preterm Infants. *The Journal of Pediatrics* 1998;3:426-430.

Q & A, news...

Questions, comments, submissions, 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 together.

News: I'm assisting wake AHEC in planning a pediatric feeding conference for May 2000, details to follow.