

Follow the Swallow: Swallowing Issues Across the Lifespan

Infant Feeding

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- Successful emergence of communication = successful feeding and swallowing
- Normal feeding patterns reflect early developmental pathways that are the basis for later communication skills

Infant Feeding and Swallowing

- Oral feeding that requires coordination of sucking, swallowing and breathing is the most complex sensorimotor process for newborns
- Oral feeding is a complicated process involving sequential timing of the tongue, larynx and laryngeal muscles
- 26 muscles and 6 cranial nerves are used in coordinating a safe and efficient pharyngeal swallow

Prenatal Swallowing and Sucking

- In utero swallowing is important for the regulation of amniotic fluid volume and the maturation of the fetal digestive tract
- Pharyngeal swallowing has developed in most fetuses by 15 weeks gestation and fetuses are consistently swallowing by 22 to 24 weeks

Prenatal Sucking and Swallowing

- True suckling begins around the 18th to 24th week and is characterized by distinct backwards/forwards movements of the tongue
- Frequency of suckling motions can be altered by taste

Prenatal Swallowing and Sucking

- Suckling is the only movement pattern that can be utilized by neonates because the tongue completely fills the oral cavity
- Tongue does not extend beyond the labial border

Prenatal Feeding and Swallowing

- BY 34 weeks gestation, some HEALTHY preterm infants suckle and swallow well enough to sustain full oral feedings
- Decreased rates of fetal sucking are often associated with digestive tract obstruction or neurologic damage

Infant Feeding and Swallowing

- The development of independent, social feeding experiences begins at birth and progresses throughout the first few years of childhood
- Successful feeding experiences in infancy fosters efficient nipple control, reaching, smiling and social play. Feeding gradually becomes a social event

Oral Feeding Readiness

- Infants should be able to maintain an alert or quiet awake state for 5 minutes prior to feeding – this often ensures a higher volume of intake
- Ready to feed babies will root for the nipple when presented, organize the tongue and orient the body to midline with arms coming forward to assist

Ability to Coordinate Swallowing and Breathing

- Coordination of swallowing with sucking and breathing reflects the infants skill of managing fluid while protecting the airway
- Premies often suck in excess of their ability to swallow, presenting with a bolus larger than they can handle, requiring multiple swallows to clear and can obstruct the airway for a prolonged period of time
- Length and frequency of apnea during feeding decrease as babies mature

Ability to Coordinate Swallowing and Breathing

- If the amount of fluid is larger than the tongue can hold, infants frequently reduce seal on the nipple resulting in anterior spillage
- Fast fluid rate may also spill into the nasopharynx or the hypopharynx, creating wet/congested sounds

Ability to Coordinate Sucking and Breathing

- Vocal cords should be closed during infant swallowing. When an infant appropriately completes the swallow before opening the airway, the swallow is quiet.
- When inhalation occurs just prior to completion of the swallow, the airway opens too soon and air escape through partially closed cords creates stridor

Infant Feeding and Swallowing

- Frequent pauses between feeding bursts may lead to difficulty resuming efficient sucking, which often leads to discontinued feedings
- If this pattern becomes habitual, infants are likely to gain weight slowly or fail to thrive
- If interaction is problematic between parent and infant, the infant may show lack of pleasure with feeding, poor appetite, or vomiting

Coordinating Swallowing and Breathing

- An infant who swallows multiple times is not regulating their intake well
- A bolus may be too large if the nipple flow is too fast, if his sucking pressure is too great, or if his sucking bursts are too long
- Breast fed babies have to work to eat – too fast a flow rate prevents the infant from regulating how much they're getting, resulting in eating too quickly and easily

Spit Happens:

- 85% of preemies have some degree of GERD compared to 10-20% of full term babies
- GI series including the sphincters, esophagus, stomach motility and intestines do not fully mature until 38 weeks

Reflux 101: Jan Gambino

- Infants develop reflux due to a number of reasons including:
 1. Poor trunk control and underdevelopment of abdominal muscles in the 1st month of life
 2. Stomach lacks flexibility/stretch – doesn't expand
 3. Infants eat too large a volume for stomach size with a liquid diet
 4. Shortened esophagus
 5. LES relaxation

Reflux 101 Continued: Jan Gambino

6. Poor motility
7. Immature neurologic system
8. Hiatal hernia
9. Delayed gastric emptying
10. Intolerances/allergies
11. Constipation

“To Thicken or Not to Thicken”

- Rice cereal cannot be used to thicken breast milk
- Additional types of cereals open concern for allergies/sensitivities (ie. Gluten)
- Simply Thick is not an option in preemies because of the potential risk for developing NEC

“To Thicken or Not to Thicken”...

- Thickening feeds slows gut motility
- Rice cereal increases caloric density and shifts the balance of nutrition towards carbohydrates
- Thickeners can decrease hydration
- Thickeners can decrease regurgitation but not necessarily reduce the frequency or discomfort associated with GERD

Transition Feeding

- Typically developing infants begin to show readiness signs for spoon feeding between 4-6 months of age
- Some of these signs include: sitting with minimal support (good head support and trunk strength), hand to mouth exploration, ability to move the tongue independent of the lips, and anatomic changes in the oral cavity that allows for more vertical movement of the tongue

Transition Feeding

- The “critical” period for typical infants to begin consuming non-liquids is 6-7 months of age
- The longer the delay in the introduction of textures, the more difficult it is for children to accept new consistencies
- Feeding difficulties often begin around 6 months of age but go untreated until around 13 months

Starting Spoon Feeding

- Need to carefully take into consideration what we’re offering our infants
- The number one calorie source from all solid foods is refined white flour (aka. rice cereal) – priming infants metabolically and from a flavor perspective to like the wrong things
- Dr. Alan Greene’s “White Out” campaign

Introducing Spoon Feeding

- 94% of parents give up on feeding a new vegetable by 5 times or fewer
- Only 1 to 2 parents in 100 will offer a new vegetable or fruit a full 10 times
- Encourage parents to provide a variety of flavors and consistencies and do multiple times in a relaxed positive environment

How Children Become Competent Eaters

- 8-15 months – goal is to have the child at the family table feeding themselves soft table foods
- Tips: - offer variety of foods
 - let them gradually get used to new food
 - let them eat as little or as much as they want
 - set expectations for behavior at the table

Transition from Puree to Textures

- As strength, variety and control of the lips, jaw and tongue emerge, a greater variety of food textures and consistencies are tolerated
- Placing a new food in the mouth does NOT mean that the infant/child will use the appropriate oral motor patterns for that food type
- If an infant/child has no experience with various consistencies/textures, it will likely affect his oral motor and speech development

Transition from Purees to Textures

- Infants/children must maintain esophageal motility to develop successful feeding skills
- "Use it or Lose it" theory
- Important to maintain some type of oral feeding/tastes daily
- Paramount in children being able to transition to solid consistencies

Transition from Purees to Solids - Troubleshooting

- Crunchy foods that melt – puffs, dry cereal
- Sticky foods – potatoes (weak, poor tongue control, thick secretions, hypersensitivity)
- Slippery/mixed foods – fruit cocktail, soups (poor coordination of tongue, slow oral transit)
- Runny – pureed fruits (weak or poor lingual control)

Transitioning from Breast/Bottle to Cup

Several skills must be present to successfully transition to cup drinking. Some of these include:

- Head/neck control for extension/flexion
- Jaw stability
- Ability to maintain lip seal
- Lip rounding
- Negative pressure to pull bolus into mouth
- Tongue elevation to hard palate
- Liquid bolus control

Transition from Bottle to Cup

Take into careful consideration cup selection:

- Non-spill sippy cup
- Spout cups
- Open cups
- Straw drinking

This is a trial and error process! Patience and persistence are a must.

Videofluoroscopic Evaluations of Swallowing (VFSS) Considerations

- Expertise of the clinician conducting the evaluation
- Identify purpose and goals for the assessment
- Ensure the exam includes all 3 phases of swallowing
- Encourage families to take their own food, utensils, etc. and participate in the study

Videofluoroscopic Evaluation of Swallowing (VFSS) Results/Recommendations

- The purpose of a VFSS is not to determine the presence or absence of aspiration
- If an infant/child “passes” a swallow study, it does not guarantee that a child can meet nutritional needs orally
- Explore appropriate consistencies that a child can handle safely
- Explore appropriate therapeutic techniques to facilitate treatment outcomes

Important Feeding Considerations

- Encourage oral intake, no matter the amount, at all costs – Quality vs. Quantity
- Infants/Children need to appreciate the taste of food and the sensory experience through the GI tract
- Esophageal motility must develop

Feeding = Communication

- Feeding is truly a social experience
- To truly have success with feeding therapy, all aspects of the child must be considered
- A good therapy plan will incorporate language and feeding/swallowing skills conjointly
- Oral motor development has a direct correlation on speech development

Resources

- www.EllynSatter.com
- www.mealtimenotions.com
- Food Chaining with Cheri Fraker and Laura Walbert
- Cheriandlaura.blogspot.com
- The Pediatric Dysphagia and Feeding Newsletter – Krisiti Brackett
- www.popsicle.org
- neonataltherapists.com
- www.DrGreene.com

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