Interventions for Transitioning from Enteral to Oral Feeding in Preterm Infants

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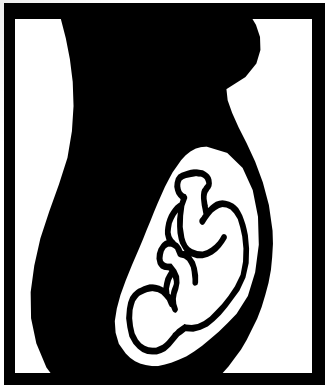
Preterm Infants

- Preterm infants are defined as having been delivered prior to 38 weeks gestational age (GA)
  - Infants born before reaching this gestational age may experience difficulty with feeding and swallowing



Developmental Milestones

Swallowing milestones in the developing fetus--weeks in GA:

- Swallowing first appears: 13-16 weeks
- Sucking begins: 18 weeks
- Upper and lower respiratory development begins: 21-25 weeks
- Lungs may mature enough to breathe air with difficulty: 26-29 weeks
- Ability to produce a coordinated suck-swallow-breathing pattern emerges: 32-34 weeks

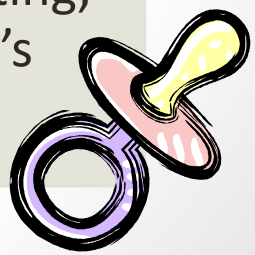
Note. Adapted from Hall, K.D. (2001). *Pediatric Dysphagia: Resource Guide.* Boston: Delmar Cengage Learning.

Preterm Infants & Oral Feeding

- The level of coordination, strength, and energy required for a mature nutritive suck do not typically start to develop until **32 weeks GA** in a stable preterm infant.
  - A mature nutritive suck is required in order to establish oral feeding/ability to obtain nutrition from a nipple

Nutritive vs. Nonnutritive Suck

Nutritive Suck (NS)	Nonnutritive Suck (NNS)
• 32 weeks GA • Develops into suck-swallow-breathe pattern, typically 1:1:1 or 2:1:1 • Breathing must coordinate with swallowing to protect airway • Associated with achieving oral nutrition, oral sensorimotor development and early infant/caregiver bonding	• Immature NNS as early as 27-28 weeks GA • Occurs in “bursts” with several sucks per burst, followed by a pause to swallow • These bursts increase in frequency with age • Can co-occur with breathing • Prerequisite for NS • Calming, state regulating, and soothes the child’s need to suck



Preterm Infants: 2 Intervention Approaches

Oral Stimulation Program

- Weeks 26-29 GA

Establish Nonnutritive Suck

- Weeks 30-34 GA

Oral Stimulation Program 26-29 weeks GA

- Oral Stimulation Programs have been associated with:
  - Faster transition to total oral feeding
  - Expression amplitude component of sucking, leading to increased strength and more effective stripping action
  - Greater weight gains

Oral Stimulation Program 26-29 weeks GA

- Consider including perioral, intraoral, and non-nutritive sucking components with this population
- Duration counts!
  - Duration of the stimulation selected may indicate increased results for weight gain and motor function

See (Fucile, Gisel, and Lau, 2002):

Recommended program included in presentation handout

Oral Stimulation Program

- Provide infant with opportunities to orally explore a variety of toys
- Encourage infant to suck on fingers and/or pacifier during tube feedings
- Rub child's face with a variety of textures (soft/smooth-stiff/rough)
- Use a finger to apply firm pressure to the gums, tongue, and teeth (if applicable). Start at midline and work your way back. Repeat 3-4 times.
- Provide the infant opportunities for NNS (finger or pacifier)

Note. Adapted from Hall, K.D. (2001). *Pediatric Dysphagia: Res*
Guide. Boston: Delmar Cengage Learning.

Oral Stimulation Program cont.

- Provide infant with toothette, small NUK® toothbrush, or gloved finger dipped in water, formula, or breast milk. Apply pressure downward, and then apply a finger stroke. Repeat if the infant tolerates this and has a positive response.

Note. Adapted from Hall, K.D. (2001). *Pediatric Dysphagia: Resource Guide.* Boston: Delmar Cengage Learning.

Oral Stimulation Program cont.

Modifying oral motor tone with sensorimotor techniques:

- For children with high muscles tone, use a soft cloth to apply deep, firm, rhythmic pressure around the mouth. Hold the child's cheek between your index and middle finger and shake the cheeks on both sides. This improves facial elongation.
- For children with low muscle tone, use light, rhythmic tapping and vibration to the cheeks.

For either case, diagonal shaking of the tongue is reported to improve graded tongue movements and elongation. Firm, rhythmic tapping to the dorsum of the tongue reportedly improves tongue cupping.

Note. Adapted from Hall, K.D. (2001). *Pediatric Dysphagia: Resource Guide.* Boston: Delmar Cengage Learning.

For Additional Resources:

Arvedson, J., Brodsky, L. (1993). *Pediatric swallowing and feeding: Assessment and management.* San Dieago: Singular Publishing Group.

Fucile, S., Gisel, E.G., Lau, C. (2002). Oral stimulation accelerates the transition from tube to oral feeding in preterm infants. *Journal of Pediatrics, 141,* 230–236.

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Establishing NNS 30-34 weeks GA

- Establishing a nonnutritive suck before or during enteral tube feedings has been associated with:
  - Accelerated suckling maturity
  - Weight gain
  - Oxygen saturation
  - Gastrointestinal motility
  - Accelerated oral feeding
  - Earlier discharge from hospital

NNS and Oral Feeding Readiness

Rule of Thumb:

- If an infant **can** produce a **nonnutritive suck**, he/she **may be able** to produce a **nutritive suck**
- If an infant **cannot** demonstrate a **nonnutritive suck**, he/she **cannot produce a nutritive suck**, and is not ready for oral feeding -Gale (2000)

Other factors to consider to determine oral feeding readiness :

Respiratory maturity, GA, tolerance of enteral feeding, bradycardia, tachynea, feeding refusal, feeding proficiency

NNS and Transition to Oral Feeding

- Repeated attempts at oral feeding prior to infant readiness may actually delay development of oral feeding skills.

- Nipple readiness signs to watch for:
  1. Physiologic stability
  2. Alertness levels
  3. Successful NNS

Procedure for Establishing NNS
30-34 weeks GA

1. Place a gloved finger or a pacifier in the infant's mouth
2. Press firmly 4-6 times (1-2 times per second) on the middle of the tongue
3. Pause to see if the infant continues unassisted sucking
4. Repeat as tolerated

Note. Adapted from Hall, K.D. (2001). *Pediatric Dysphagia: Resource Guide.* Boston: Delmar Cengage Learning.

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Field, T., Ignatoff, E., Stringer, S., Brennan, J., Greenberg, R., Widmayer, S., & Anderson, G. C. (1982). Nonnutritive sucking during tube feedings: Effects on preterm neonates in an intensive care unit. *Pediatrics, 70*, 381–384.

Fucile, S., Gisel, E.G. (2010). Sensorymotor interventions improve growth and motor function in preterm infants. *Neonatal Network, 29*(6), 359-366.

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Fucile S., Gisel, E.G., Lau, C. (2005). Effect of an oral stimulation program on sucking skill maturation of preterm infants. *Developmental Medicine & Child Neurology, 47*, 158-162.

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Gale, S. (2000). Bottle-feeding premature infants. *Advance for Speech Language Pathologists & Audiologists, 8*(10), 11-13. In K. Hall ed. *Pediatric Dysphagia: Resource Guide.* Boston: Delmar Cengage Learning.

Hall, K.D. (2001). *Pediatric Dysphagia: Resource Guide.* Boston: Delmar Cengage Learning.

Lessen, B. (2011). Effects of premature infant oral motor intervention on feeding progression and length of stay in preterm infants. *Advances of Neonatal Care, 11(2)*, 129-139.

Logan, W., Bosma, J. (1967). Oral and pharyngeal dysphagia in infancy. *Pediatric Clinics of North America, 14,* 47-61. In K. Hall ed. *Pediatric Dysphagia: Resource Guide.* Boston: Delmar Cengage Learning.

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