Considerations for Nursing, Nipples and Bottles

Breast Feeding

- Positioning
  - The initial position for intake for an infant during breast feeding is inclined sidelying and not supine or sitting. Benefits for the infant include:
    - Easier breathing (more A-P rib cage movement)
    - Better head and trunk alignment
    - Less gravity load during jaw and tongue movement
    - Automatic overflow outlet (excess fluid drains out of the mouth from the lower cheek)
    - Increased subglottic air pressure for airway protection
- Flow
  - Flow from the breast begins with letdown as the infant orients to the nipple. Flow slows to 0-3 drips per second after letdown. The infant's mouth fills most efficiently with the negative component of active suck that creates negative pressure to pull the fluid into the mouth.
- Nipple
  - Nipple shape is dynamic, but only if the baby uses both positive and negative pressure changes in the mouth. Nipple shape is initially a short cylinder which changes to fit the infant's mouth as negative pressure is applied with the tongue, cheeks and lips. The nipple does not extend beyond the tongue blade. The tongue cups around the nipple during nursing. With each swallow, the tongue tip and the midblade of the tongue elevate toward the hard palate. As this occurs, the jaw elevates and the lips seal (positive pressure phase). The tongue then moves away from the hard palate, the jaw drops, the posterior cheeks contract, the soft palate elevates and the lips remain sealed (negative pressure phase). The nipple tissue changes contour as these movements and pressure changes occur. Weak babies use positive pressure, which can result in tissue damage on the nipple including cracking and bleeding.

Problem / Factors To Consider

- Noisy suck or inefficient suck
  - Poor lip seal, poor tongue seal
  - Excessive forward back tongue movement with poor midblade elevation
  - Weakness for lips, posterior cheeks and durational jaw movement
  - Head and trunk out of alignment
  - Poor coordination of breathing and swallowing
- Loss of fluid
  - Poor lip seal, poor tongue seal
  - Excessive forward back tongue movement with poor midblade elevation
  - Head and trunk out of alignment
  - Poor coordination of breathing and swallowing
- Infant falls asleep
  - Fatigue due to inefficient suck
  - Weak lip, posterior cheeks and jaw, poor tongue seal
- No suck, but mouths nipple
  - Weak lips, cheeks and tongue
  - Poor durational jaw movement
- Clamps on nipple
  - Flow too fast
  - Generalized weakness, especially for posterior cheeks and jaw
- Poor weight gain
  - Combination of all of the above
- Nipple confusion
  - Confusion is a cognitive state
  - Babies are reflexive
  - The baby is not confused

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– Rather, think of the difficulty in changing from one utensil to another as Specific Oral Motor Weakness
– Can be demonstrated with an assessment using the Beckman Protocol (see page 79)

Bottle Feeding

♦ Positioning
  – For young infants, should continue in inclined sidelying
  – Frequently, however, the infant is placed in supine, which places the infant at a mechanical disadvantage. In supine, disadvantages may include:
    • More shallow breathing (less A-P ribcage expansion in this position)
    • Head extended or hyperextended out of alignment with the trunk, making coordination of sucking, swallowing and breathing more difficult
    • Gravity and the weight of the bottle press down on the jaw, adversely affecting controlled movement. Gravity also pulls the tongue into a more retracted position, adversely affecting the coordination of suck/swallow/breathe.
    • Excess fluid pools behind the back of the tongue in the pharynx, causing choking, gagging and possible aspiration
    • Healthy babies can usually adapt to changes in position. Weak babies cannot adapt.

♦ Flow
  – Flow from the nipple is not regulated by the manufacturer and is not consistent from nipple to nipple, even for nipples of the same type, packaged in the same container. The numbers on the boxes of preemie nipples do NOT correlate with the flow of the fluid. To check nipple flow, fill the bottle, turn it upside down, and count the number of drips per second. It should be 0 to 3 drips per second. For a continuous flow, measure the amount that flows in 10 seconds, then divide that amount by 10 to determine the flow rate per second. Remember that a faster flow does not mean more intake will result. It does mean less negative pressure will be required. If using a faster flow, the baby should be positioned in inclined sidelying for safety.

♦ Bottle types
  – Gravity Flow
    • Occurs with a traditional bottle that does not have an inner sac. The fluid flows into the nipple through the position of the bottle. The base of the bottle must be higher than the nipple to allow fluid to fill the nipple. The upward tilt of the bottle encourages extension or hyperextension of the head and neck as the infant attempts to stay in alignment with the utensil.
    • Requires less negative pressure to move the fluid out of the nipple.
  – Negative Pressure Flow
    • Occurs in bottles with an inner sac, such as Playtex or Gerber. The caregivers must push the air out of the sac, leaving the fluid at the nipple, even when the bottom of the bottle is lower than the nipple. This type of bottle requires the baby to attain and maintain negative pressure to move the fluid out of the nipple. The nipples do not collapse during nursing because there is no air inside the sac. These bottles may require more effort for a baby with less oral strength.

♦ Nipples
  – Numerous shapes and sizes of bottle nipples have been developed. Nipples of different firmness are also available. Find the nipple that matches the baby's pattern the best.
    • Make oral intake less effortful. Babies should NOT be stressed during intake. **The utensil does not change the oral patterns; the utensil accommodates whatever patterns are present.**

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- Short cylindrical nipples and nipples with an expanded bulb shape at the end allow the tongue to cup around the nipple and elevate toward the hard palate.
- Nipples with a rounded palatal side and a flat tongue side (called orthodontic) effectively lower the height of the palatal vault. Cupping of the tongue around the nipple is not complete, due to the shape of the nipple. Tongue movement is extension – retraction with limited elevation. Requires less negative pressure.
- Long nipples deliver the fluid past the midblade of the tongue, and possibly past the body of the tongue completely, directly into the pharynx. Rather than sucking the fluid out with negative pressure, the infant can squeeze the fluid out with jaw movement.
- One-way flow valve nipples (Haberman, Cleft nipple system) allow the caregiver to pre-fill the reservoir in the nipple. The baby can then use positive pressure to chew the fluid out. If negative pressure occurs, the nipple refills.
- The firmness of the nipple impacts the amount of negative pressure needed. The softer the nipple, the less negative pressure is needed.

Problem / Factors to Consider

- Noisy suck or inefficient suck
  - Poor lip seal, poor tongue seal
  - Excessive forward back tongue movement with poor midblade elevation
  - Head and trunk out of alignment
  - Poor coordination of breathing and swallowing
  - Positioned in supine
  - Nipple flow too fast or too slow
  - Collapsed nipple
  - Nipple too firm or too long
- Loss of fluid
  - Poor lip or tongue seal
  - Head and trunk out of alignment
  - Poor coordination of breathing and swallowing
  - Positioned in supine
  - Nipple flow too fast
  - Nipple too soft or too long
- Infant falls asleep
  - Fatigue due to inefficient suck (see factors above)
- No suck, but mouths nipple
  - Weak lips, posterior cheeks or tongue
  - Reduced durational jaw movement
  - Nipple flow blocked
  - Nipple collapsed
  - Nipple too firm
- Clamps on nipple
  - Weak lips, posterior cheeks, or jaw
  - Reduced durational jaw movement
  - Nipple flow blocked
  - Nipple collapsed
  - Nipple flow too fast
- Poor weight gain
  - Combination of all of above