

Assessment & Intervention of Feeding in the Young Infant Part III

DARS ECI Webinar Series
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INTERVENTION STRATEGIES

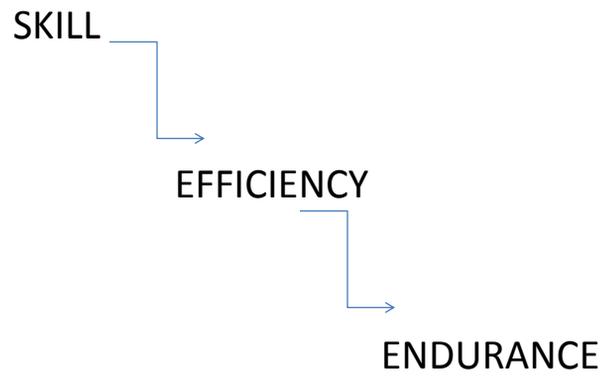
Support Positive Experiences

- Support SKILL first!
 - Look to stability signs to determine readiness for and influence of feeding
- Implement feeding supports to facilitate skill development
- Without skill:
 - Repeated experiences of feeding with POOR skill may lead to avoidance behaviors and...
 - Repeated experiences build neural pathways that support development of POOR skills
 - Gagging
 - Gasping
 - Poor vital signs (desaturation)

Once Skill is Developed...

- Skill leads to efficiency during feeding
- Efficiency leads to endurance sufficient for feeding full volumes and discharge
- Skill, efficiency, and endurance lead to ability to eat comfortably, and to eat sufficient volume for appropriate growth

To review...



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GETTING BABY READY TO EAT

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Stimulation or Experience?

- “Oral stimulation” is considered as a programmatic approach to providing tactile input to the face/mouth/tongue/lips of an infant
 - Oral motor stretches (Beckman)
 - Any tapping, temp change, etc. that you provide
- “Oral experiences” refers to infant-driven positive experiences around face/mouth/tongue/lips
 - Kangaroo mother care (KMC)
 - Non-nutritive sucking
 - Independent exploration of face/mouth

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Need to Differentiate

- Use is dependent upon the child’s history and needs
- Oral experiences have a body of research supporting the benefits
- Oral stimulation programs have less research
 - No oral stimulation program has been conducted without non-nutritive sucking, which is known to be beneficial
 - For preemies:
 - Concerns regarding poor weight gain and stress during stimulation programs (e.g., Apnea, bradycardia).
 - No decrease in length of stay or gestational age at which full oral feedings are achieved.

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Guidelines for Use of Oral-Facial Stimulation Materials

- Should satisfy one or more of these purposes:
 - Stimulate a more active sucking pattern
 - Reduce hypersensitivity in the mouth
 - Reduce the strength of the tonic bite reflex
 - Increase acceptance of objects coming toward face
 - Increase the amount of oral experience and exploration so child will obtain better tongue, lip, and jaw movements for feeding and sound play
 - Increase oral organization

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Non-nutritive Sucking

- Largest body of evidence to support benefits
- No evidence of detrimental effects
- Significantly decreases the length of hospital stay in preterm infants
- Supports transition from tube to bottle feeds
- Supports better bottle feeding performance

(Harding, 2009; Pinelli & Syminton, 2005)

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Using Sensory Environment: Vestibular/Movement

Ways to Alert

- Pick up baby and rock him from side to side
- Do not use a rhythmical motion as it could make baby less alert
- If firmly supporting baby's head, could use up and down motion
- Try prone position for feeding

Ways to Calm

- Swaddle the baby as deep pressure provided may help him integrate sensory input
- Use rhythmic vertical bouncing movement
- Make sure all movement is rhythmical
- Some children with significant impairments to sensory system may need very firm bouncing or jiggling

Using the Sensory Environment: Proprioceptive/Tactile

Ways to Alert

- Present uneven or rough textures
- Use light tickles or touch on palms or soles of feet; massaging palms, soles, or crown of head can maintain alert state
- Use cool washcloth on face
- Change clothing or diaper or unwrap baby so he is not too warm
- Elicit rooting
- Interact with baby face to face

Ways to Calm

- Swaddle baby to provide calming effect as the baby feels more secure
- Reposition baby by pulling arms and shoulders slightly forward to midline and slightly flexing hips
- Place a small rolled-up washcloth beneath infant's feet for him to grab with his toes to provide additional calming
- Make sure baby maintains flexed position
- Elicit non-nutritive sucking
- Provide deep pressure to limbs and trunk
- Use foods and liquids of more thickness and texture if approved by the pediatrician

Using the Sensory Environment: Temperature/Olfactory/Gustatory

Ways to Alert

- Provide very warm or very cold stimuli
- Use any strong or unique odors (e.g., perfume, loose spice tea)
- Offer foods with very sharp tastes such as sour, bitter, salty or sweet (keep in mind that jarred baby foods have very little added salt or sugar and thus may be too bland)

Ways to Calm

- Use room temperature foods
- Use subtle scents (e.g., lavender, vanilla)
- Avoid food with sharp tastes

Using the Sensory Environment: Visual/Auditory

Ways to Alert

- Use bright colors
- Provide shiny objects
- Move objects in the child's peripheral vision
- Make use of contrasting bright colors or shapes
- Use bright lighting
- Talk to the baby with varying pitch, volume, and rhythm
- Music may improve arousal
- Make unexpected or loud noises

Ways to Calm

- Use neutral colors
- Provide dull objects
- Use dim lighting
- Avoid moving objects
- Reduce auditory input to baby (stop talking)
- Provide soft, repetitive sounds
- Use white noise to block out other sound
- Play music with slow tempo and regular rhythm

Bottle Feeding



- Positioning and support
- Disorganized vs. dysfunctional sucking pattern
- Bottle types
 - Gravity flow vs. negative pressure flow
- Nipple types
 - Short cylindrical, long, “orthodontic”

Birth to Three



Bottle Feeding



Positioning:

- Should be supportive of midline positioning of arms, legs, neck, head
- Should prevent fluid from collecting in pharynx
- Should encourage close contact with parent
 - Elevated side-lying appears to be beneficial and does not increase length of stay for preemies
 - Elevated side-lying appears to improve oxygenation during feedings
 - Elevated head-tilt position decreases apnea and bradycardia during feedings

(Jones, 2008; Clark, 2007; Jenni, 1997)



Neonatal Oral Motor Assessment Scale (NOMAS) – Marjorie Meyer Palmer, MS

- Defines sucking into three categories
 - Normal
 - Disorganized
 - Dysfunctional
- Disorganized – “the lack of rhythm of the total sucking activity”
- Dysfunctional – “the interruption of the successful sucking activity by abnormal movements of the tongue and jaw”

Supporting Respiratory Organization

- **Proactive VS. Reactive**
 - REGULATION: designed to *proactively* provide immature SSB pattern to infants who have burst of sucking of >5 without breathing
 - Facilitates infant’s burst/pause rhythm, to ensure at least one breath every 3-5 sucks
 - For respiratory-compromised infants, ex-preemies, infants with greater than 7 sucks in a row without a breath

Regulation Technique

- Gentle shifting of infant and/or bottle (or breast occlusion) to slow or stop flow
- Tipping of bottle
 - Least prompt: Tip baby and/or bottle but leave in groove
 - Mild: In central tongue groove
 - Mod: Out of central tongue groove
 - Max: Removal of bottle
- Stability of physiologic, motor and state
- If continue sucking, move bottle to side of mouth to release suction to change tactile input

Supporting Respiratory Organization

- Proactive VS. **Reactive**
 - PACING: designed to *reactively* respond to infant's fatigue/stress by providing pauses
 - Brief (1-2 minute) pauses to allow infant to reorganize
 - Very effective with medically compromised infants, especially those with respiratory compromise
 - As they fatigue, they start to pant, so you give a break

Bottle Considerations



- Criteria for an Effective Bottle
 - Shape of bottle supports head-positioning needs of infant
 - Holds appropriate amount of fluid so as not needing to refill and disturb feeding process
 - Is easy and pleasing for infant to hold
 - Fits size and shape of feeder's hand
 - Is sturdy and unbreakable
 - Can be colored or decorated to attract and maintain infant's visual attention

Nipple Considerations

- Criteria for an Effective Nipple
 - Fits size and shape of infant's mouth
 - Flow rate is appropriate for:
 - Infant's abilities
 - Consistency of liquid being presented
 - Infant's feeding position
 - **DO NOT want holes to be artificially enlarged, causing a rapid, uncontrolled flow of liquid
 - Provides adequate stiffness or resistance to infant's sucking pattern. Soft nipple more appropriate for weak suck or easily fatigued
 - Should NOT collapse when infant sucks



Nipples

- Current options include:
 - Standard Nipple
 - Mead Johnson Slow Flow; Similac Slow Flow
 - Gerber slow, medium and fast flow nipples
 - Orthodontic nipples:
 - NUK: regular, slow, medium, fast
 - Similac
 - Cleft Palate:
 - Mead Johnson Cleft Palate Nurser
 - Haberman Feeder
 - Pigeon cleft palate nipple

Standard Nipple



- Slow-Medium flow rate
- Several researchers state this should be the nipple used with most infants, and many recommend use of this nipple for the first feed of all infants
- Disposable
- Milk continues to flow when baby pauses

Disposable Slow Flow

- Mead Johnson
 - -teal ring
 - Slow flow
 - Ideal for preterm infants
- Similac
 - -yellow ring
 - Slow flow
 - Ideal for preterm infants



Orthodontic nipples



- 2 types available (NUK & Ross Similac Orthodontic)
- **High** flow rate
- Breastfeeding is **NOT** an indication to use this nipple
- Require a completely different tongue and lip motion to obtain milk
- disposable
- variable flow rate
- good for infants with poor lip closure or decreased lingual cupping
- good for infants with “compression” suck
- good for thickened feeds

Gerber Slow and Medium Flow Nipples



- Designed to help infants who have difficulty swallowing a large amount of milk at one time.
- May be helpful for babies who have to swallow multiple times to take care of the volume in their mouths.
- Reusable
- Does not flow when baby pauses

Gerber Fast Flow Nipple



- Occasionally, infants requiring thickened feeds need a faster flow nipple
- Reusable
- Continues to flow when baby pauses

Therapeutic Troubleshooting

Problem

- Weak suck (overall weakness from medical compromise, respiratory or endurance problems)



Treatment Techniques

- Position appropriately
- Establish non-nutritive suck
- Apply firm, gentle pressure to the lips
- Use firm jaw and cheek support
- Use small bottle so you can hold it and still provide jaw and cheek support
- Once suck pattern is established, gently try to pull nipple from mouth to promote stronger sucking
- Slightly increase bolus size

Therapeutic Troubleshooting

Problem

- Excessive jaw movement (may result in abnormal tongue pattern and compromised lip seal)
- Caused by:
 - Jaw instability, which may be result of inappropriate tone
 - Premature infant not developing tone in bulk in oral-facial muscles
 - Neck hyperextension may yield jaw instability

Treatment Techniques

- Head and neck aligned or with slight flexion
- Provide some pressure with finger under infant's jaw to help grade movement of jaw (mandible, not base of tongue)
- Bring infant's head into more neck flexion to allow chest to provide stability for the jaw (monitor respiration carefully)

Therapeutic Troubleshooting

Problem

- Weak latch/open mouth; lack of interest
 - Caused by:
 - Poor arousal
 - Poor hunger signals
 - Stress
 - Low oral-motor tone
 - Infant trying to maintain open airway

Treatment Techniques

- Arouse infant
- Stimulate rooting
- Try prone position
- Use lingual stroking or tapping to increase tone and facilitate forward tongue position
- Use organizing techniques

Therapeutic Troubleshooting

Problem

- Poor lip seal (reduced negative pressure for suck- hear a smacking sound when pressure is lost and may see milk leaking from corners)
- Caused by:
 - Decreased muscle tone/weakness (premature)
 - Excessive jaw mvmts & wide jaw excursions make closure difficult
 - Abnormal tongue mvmts with strong protrusion push fluid out
 - Absent or small sucking/fatty pads



Treatment Techniques

- Provide external support to cheeks and lips to help infant close lips around nipple
- Put thumb and index (or middle) finger on sucking pads to help infant purse lips to help infant purse lips
- Provide some jaw support, if needed
- Use smaller bottle so you can reach around to provide support



Therapeutic Troubleshooting

Problem

- Poor initiation of sucking (if baby is hungry but cannot initiate sucking, becomes even fussier)
- Caused by:
 - Hyperactive root reflex may result in rooting nipple rather than latch
 - Mouth wide open/unable to close to start sucking
 - Ineffective tongue protrusion or mildly hypersensitive response which prevents initiation
 - If too hungry, may have problems initiating sucking
 - Crying is LATE sign of hunger

Treatment Techniques

- Control head through positioning to decrease excessive rooting
- Put nipple on midline of baby's tongue, apply downward pressure, and provide cheek support
- If child has trouble closing mouth, assist with jaw control

Therapeutic Troubleshooting

Problem

- Disorganized sucking (characterized by disorganized and uneven pattern; coughing and choking typically noted)
- Factors:
 - General neurological disorganization
 - Mild respiratory problems
 - Nipple flow rate incompatible with infant suck

Treatment Techniques

- Bundle infant to decrease extraneous mvmt
- Reduce extraneous noise and light
- Use rocking or music to help with rhythm
- Use gentle pacing (i.e., take bottle away after one or two sucks and allow pause)
- Reduce flow rate (e.g., different nipple, thicker liquids). Thicker liquids cause infant to suck harder and may improve timing

Therapeutic Troubleshooting

Problem

- Fatigue or lethargy during feeding (often a reflection of an infant having to work too hard to breathe and eat)
 - Caused by:
 - Poor coordination of breathing and eating

Treatment Techniques

- Provide smaller amounts by mouth and increase gavage (tube) feeding
- Provide non-nutritive suck/oral stimulation during gavage feeding
- Reduce distractions in environment



SPECIAL POPULATIONS: PREEMIES

Premature Infant vs Healthy Term Infant

- Premature Infant
 - Immature suck, swallow, breathe pattern
 - Behavioral states are not well defined
 - Auditory, tactile, vestibular, and visual systems are not fully developed
- Term Infant
 - Coordinated and consistent suck, swallow, breathe pattern
 - Behavioral states generally well-defined, with clear transitions
 - Auditory, tactile, vestibular, and visual systems are more mature



At risk continued...

- Preterm – commonly have problems with fatigue, suck/swallow/breathe coordination
- Gastrointestinal issues (gastroesophageal reflux, tracheo-esophageal fistula, esophageal atresia) - delayed gastric emptying, poor motility
- Prolonged intubation/suctioning (medically fragile, chronically ill, on ECMO) - prone to aversion
- Specific syndromes that will affect neurological status, facial anatomy, etc...

Feeding: An Interactive Process

- Promote a positive environment for feedings
- Observe for signs of readiness for nipping
- Observe for signs of stress during feedings
- Educate families and others about providing a positive feeding experience for babies

Promotion of an Ideal Feeding

- Start with one feeding per day
- Quality versus quantity feeds
- Feed infant in a quiet alert state
- Maintain postural control with midline orientation and good head/neck control
- Promote a positive oral sensory experience
- Pause when the infant is showing stress signs and stop the nipping if stress signs persist
- At the end of the feeding, ask yourself –
Was the feeding safe? Was the feeding pleasurable?
- Choice of nipple for each baby should be based on baby's abilities, and medical needs, not gestation or breast vs. bottle.

Readiness Cues from Baby

- At least 34 weeks adjusted gestational age
- In quiet alert state for at least 5 minutes
- Shows “hunger cues”
 - Hands to mouth
 - Smacking
 - Tongue thrusting
 - Rooting
 - Non-nutritive sucking during gavage feeds
 - Crying (late hunger cue)
- Shows signs of physiologic stability such as:
 - Smooth and regular respiratory rate
 - Stable heart rate
 - Successfully demonstrates self regulatory behaviors
- Wakes before feeding time
- Demonstrates a sustained, rhythmical non-nutritive suck



Common Stress Signs

- | | |
|---|--|
| <ul style="list-style-type: none"> – Burping excessively – Audible swallows – Spitting up consistently – Arching/posturing of trunk or extremities – Change in vital signs – Change in color – even a mild change is significant – Hiccups – Yawning – Panting – Turning/Pulling away – Change in state – Gaze Aversion | <ul style="list-style-type: none"> • Grimacing • Worried look • Hyperalert • Mottling • Pale • Coughing • Pursing lips • Tongue blocking • Dusky • Gagging • Choking • Loss of coordination suck/swallow/breathe • Sneezing • Cessation of sucking |
|---|--|

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Common Myths

- All babies with reflux throw up
- If they take a pacifier they should also be able to take a bottle
- Chin/Cheek support will teach a baby to suck
- Twisting the nipple, pulling the nipple in and out, and “milking” the bottle are appropriate ways to help the baby get his/her minimum feed



What You Can Do

- Remember the causes we have influence over –environment and caregiving practices
- ALWAYS watch for stress cues
- STOP if you see stress cues
- If these signs are noted, patient is not handling the feeding well
 - Burping excessively
 - Audible swallows
 - Spitting up consistently
 - Arching/posturing of trunk or extremities
 - Change in vital signs
 - Change in color – even a mild change is significant
 - Hiccups
 - Yawning
 - Panting
 - Squirming or increased activity
 - Change in state

Do's and Don'ts

- | | |
|--|---|
| <ul style="list-style-type: none"> • Do: <ul style="list-style-type: none"> – Swaddle – Hold in cradle position at appropriate angle while providing needed support – Support head so that head and neck are in alignment – Follow orders – Watch baby for signs of stress – Gavage feed remaining feed if baby shows signs of stress without taking minimum – Provide chin/cheek support to improve lip seal/cheek stability and feeding performance once they are sucking | <ul style="list-style-type: none"> • Don't <ul style="list-style-type: none"> – Force feed to reach a minimum – Feed baby propped up in bed – Feed without head and neck aligned – Place baby flat on lap to feed – Cup feed SGA or premature babies – Provide chin/cheek support to “teach” a baby to suck – Twist nipple, pull nipple in and out, or “milk” the bottle |
|--|---|



SPECIAL POPULATIONS: TUBE-FED INFANTS

Our Role

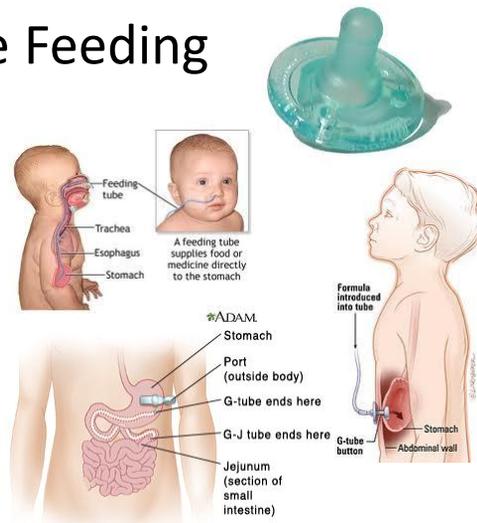
- Educate parents about tube feeding
- Prevent problems from developing
- Optimize oral motor control and oral enjoyment for exploration and feeding

Therapist Roles

- Education
 - Resource for family about tube feeding
 - Assist to prevent problems
- Ongoing Consultation
 - To monitor progress of feeding by tube and monitor development of oral skills
 - Recommend more specific oral treatment as needed
- Family Support
 - Offer opportunities for families to come together with other families to share experiences
 - If possible, set family up with a “mentor” family
- Direct Oral Treatment
 - Treat oral sensorimotor difficulties, which may involve using food
 - Goals may include:
 - improving feeding relationship
 - optimizing feeding enjoyment
 - oral normalization and desensitization
 - experimentation with new food and textures
 - Increasing pleasure in increased quantities of food

Gavage Feeding

- Bolus versus Pump
- NG, OG, G-tube, G-J tube
- Encourage non-nutritive sucking during gavage feeds using soothie pacifier
- Hold patient swaddled as patient would be held for bottle feeding



Positioning for Feeding



- Provide tube-fed child with physical and emotional nourishment that oral feeders receive at mealtime
 - If age appropriate, hold baby while tube-feeding
 - Closeness important for attachment and bonding
 - Give pacifier to facilitate non-nutritive sucking while becoming full
 - If sleeping while being fed, best position is elevated prone with a sling support or in sidelying position on right side to facilitate more rapid stomach emptying

Treatment

- Comprehensive Oral Motor Treatment
 - Focus strongly on parent-child interaction during meals and education
 - Develop positive and enjoyable use of the mouth in all its functions
 - Focus is on developing appropriate use of mouth in conjunction with respiratory and phonatory systems, in exploration, sound play, and as much oral feeding as possible
 - Food and liquid are NOT essential and may not be included at all if child has a severe swallowing disorder
 - May be introduced to provide smells, tastes, and temperatures, and to elicit specific oral movements when child is able to handle

Treatment, cont.

- Strategies include opportunities for development of sensory awareness, perception, and discrimination within the mouth
- Oral feeding is the by-product of a total program, not the major goal
- Provides support for child and family: Looks at the mouth as part of a whole child, who is part of a whole family
- Child develops skills from their own starting point on the continuum, and THEY set the pace (medical status, growth, dev. of oral skills)

Considerations

- As baby gets closer to 6 months (dev. age), consider rotating formulas with different nutritional components or use of homemade blended formula to establish digestive efficiency

<http://www.mealtimenotions.com/HomemadeBlendedFormulaHandbook.htm>

Outcomes

- Children who are dependent on tube feedings are at a higher risk of developing a feeding disorder than their healthier counterparts (Newman, 2000; Ross & Browne, 2002)
- At risk for oral aversions, oral hypersensitivity, and disassociating oral-motor movements with satiation of hunger. This makes re-initiation of feeding by mouth difficult and time intensive (Gosa & McMillan, 2006)



SPECIAL POPULATIONS: DOWN SYNDROME

Incidence & Possible Medical Issues

- Estimated incidence is between 1 in 1,000 to 1 in 1,100 live births worldwide
- Each year approximately 3,000 to 5,000 children are born with this chromosome disorder and it is believed there are about 250,000 families in the United States of America who are affected by Down Syndrome.
- Hearing deficits, congenital heart disease, intestinal abnormalities, eye problems, immunologic concerns

Specific Considerations

- Low tone
 - Low tone = Weakness
 - Tongue: reduces strength & skill for movement, shape may be thick and humped, bolus collection inefficient
 - Cheeks: reduces strength & skill for lip and cheek movement, lack control & flexibility for efficient sucking, liquid/food falls into buccal cavity, can cause mouth to hang open
- Oral control issues
 - Jaw instability and tongue protrusion
 - Tongue protrusion limits mobility and freedom of tongue to assist in eating/drinking
 - May influence the development of mature swallowing pattern because protrusion pattern is incompatible with tongue-tip elevation
- Sensory Issues
 - Decreases in postural tone can raise sensory threshold to all stimulation so ability to perceive small amts of sensory information may be reduced
 - Treatment should focus on changing aspects of overall physical environment with physical handling and positioning to increase postural tone and responsiveness to sensory input

Treatment Strategies

- Facilitating normal suckling pattern
 - Suckle pattern weak, disorganized, poorly sustained
 - Consider cardiac impact on respiration/endurance
 - Reduce impact of limiting physical patterns (extension/decreased postural tone) through positioning and handling
 - Facilitate flexion with chin-tuck position to increase sucking skill
 - Use non-nutritive sucking to stimulate stronger suck by using traction
 - Timing issues -> focus on developing a suckle pattern that is easily initiated, rhythmical, strong, sustained and efficient (pacing/regulation/external support)



SPECIAL POPULATIONS: CLEFT LIP & PALATE

Considerations

- Cleft lip alone or isolated cleft of soft palate have less trouble with feeding
 - Cleft lip only CAN breastfeed
 - Seal can be created by positioning cleft next to breast or by use of mother's thumb to take up space
- Degree of difficulty feeding strongly correlated with degree and location of clefting
- Consider grieving process of family with arrival of a *different* baby
- Focus on feeding interactions and give support as needed

Choice of Feeding System for Cleft Palate

- Important factors to consider
 - Provide as normal a mother-infant interaction as possible?
 - Give baby control of liquid flow rate?
 - Work on a positive pressure compression system?
 - Does nipple compress easily?
 - Is flow rate rapid enough without being too fast?
 - Is nipple soft to reduce unnecessary fatigue?
 - Is it readily available?
 - Is it affordable?
 - Is it safe?
 - Can it be easily cleaned?

Always:

- Feed in a more upright position
 - Allows gravity to move liquid into pharynx while directing it away from nasal cavity, ears, and cleft
- Feeding should be slow enough to prevent choking, coughing and loss of liquid into nasal cavity, but fast enough to prevent fatigue
- Burp frequently
 - Much more air swallowed during feeding w/ cleft
- Consider feeding infant smaller amounts of liquid at each feeding and increasing number per day

Cleft palate nurser



- Designed for use with babies with a cleft palate who are unable to create an effective seal for a successful suck
- Squeeze gently as infant sucks, stop when he stops.
- Some of these infants can successfully nurse even though unable to take a regular bottle
- Can be used with standard term nipple
- Allows for infant to extract milk using compression
- Made of soft plastic that is easy to squeeze in order to assist infant with milk extraction
- Feeder is in charge of flow rate
- Reusable
- Price approximately \$16 for 6 bottles

Haberman feeder



- Designed by the mother of a child with neurological problems
- Length of line on the nipple pointed toward infant's nose controls flow of formula
- Formula should always be in the nipple
- Allows for infant to use compression (positive pressure) of lips and gums to get milk
- Allows for feeder to assist with milk extraction
- Has 3 flow rates: slow, medium, fast
- Has 1-way valve to prevent backflow
- Feeder is in charge of flow rate
- Reusable
- Price approximately \$22.50 per bottle

Pigeon Cleft Palate Nipple



- Y cut nipple with thin and thick side
- Has a 1-way valve to help prevent excessive air intake and backflow
- Allows for infant to extract milk using compression
- Flow rate controlled by infant only
- Does not allow help from feeder
- Soft bottle available to order if infant needs help from feeder
- Price approximately \$3.50 per nipple

QUESTIONS?

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