Section A

The Importance of Breastfeeding as it Relates to Total Health

Presented by:

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Natural position of the tongue, shape of the palate, and position of the epiglottis in a healthy newborn
Habitual resting position of tongue of a newborn
Normal / habitual tongue posture of infant - extends out over & past mandible.
The epiglottis is in direct contact with the soft palate. The tongue is located entirely within the oral cavity. (Crelin)
Action of the tongue during normal breastfeeding
Illustration from Ros Escott article, Positioning, Attachment and Milk Transfer, Breastfeeding Review, 1989, p.35.

FIG. 4. At the start of each suck cycle, the jaws compress the lactiferous sinuses (A), trapping a bolus of milk. The tongue well up at the top (B) and a wave of compression moves back along the tongue (C, D) compressing the nipple and breast tissue against the hard palate. The milk is swept towards the end of the nipple (E) beyond to be swallowed.
Demonstrates position and action of tongue during breastfeeding (Woolridge)

Research by Dr. John R. Neil (OB/GYN)

• Did 4 years of ultrasonic research in Australia on suckling. Study of 50 normal / 80 difficult cases.
• Discovered that the normal nipple junction distance (NJD) is equal to or less than 5 mm from the hard/soft palate junction.
• Nipple/breast in and out slide movement during suck is equal to or less than 5mm.
• Normal breastfeeding tongue action has a “rocker” or peristaltic like motion.
• Bottle feeding has an abnormal “piston” action.
Dr. Neil research continued

- NJD is more likely to be abnormal with babies who had attachment problems (Statistically significant)
- 100% of babies who had a piston tongue action had used a bottle teat.
- Of those who had used a teat, 13 had piston tongue actions, and 18 had rocker.
- Of those who had not used a bottle teat, 0 had piston and 48 had rocker action.
- He prefers the term “suck confusion” rather than nipple confusion.
- He has also seen tongue “clicks” on the ultrasound - possibly due to an air leak.
Dr. Neil research continued

• Action of tongue:
  – 90% of normal action is a peristaltic wave like motion that looks like a “rocker”.
  – 10% of normal swallowers have piston like action (may be tongue-tied).

• If baby had poor attachment or sucking problems, found distance from hard/soft palate junction was greater than 5mm.
Dr. Neil research continued

• **KEY FINDING:**
  – If there was a “piston like” action of the tongue, 100% of the babies had had a bottle of pacifier.

• **PACIFIER USERS:**
  – Do not do as well on the breast although some babies are better coordinated and can do better than others.

• **SUCTION:**
  – There is mild suction during breastfeeding to hold the nipple. Stronger suction is needed to suck milk out of the bottle.

Personal conversation, 1996, plus info from others who attended his presentation at ALCA in 1996.
Rugae

• What are they?
• What are they used for?
Rugae / Transverse ridges

“In most mammals, they aid in the grinding of food, but in man they are poorly developed. They are usually optimally developed at birth when the ridges aid the suckling infant in gripping the nipple.”

Transverse ridges or rugae

Crelin ES, Scherz RG, Can the cause of SIDS be this simple? Patient Care, March 15, 1978, Vol 12, No 5:234-241
Transverse ridges of cow's palate.

Adult rugae in area just behind upper front teeth.

Close up view.
Obligate nose breathing
Newborn during quiet respiration with mouth closed.

Note soft palate and epiglottis are touching.

Crelin ES. Development of the Upper Respiratory System, Clinical Symposia, Vol. 28, No. 3, 1976
During the act of breastfeeding, Dr. Crelin states the larynx can be elevated so that the epiglottis can slide up behind the soft palate to lock the larynx into the nasopharynx. This allows the infant to both swallow and breathe at the same time (Obligate).
View looking into the mouth to illustrate the interlocking of the soft palate and epiglottis.
Atlas picture demonstrating similar relationship of epiglottis and soft palate. (Rohen/Yokocki)
Cadaver dissection demonstrating habitual tongue posture and relationship between the soft palate and epiglottis.
Previous picture altered to demonstrate interlocking of soft palate and epiglottis during breastfeeding.
Cadaver dissection demonstrating an epiglottis not fully developed.
Dissection of twin of previous picture.

Interior dissection of the pharynx from behind.

- Nasal septum
- Soft palate
- Uvula
- Tongue
- Epiglottis
- Inlet to larynx

Dissection of twin of previous picture.
This is the previous picture that has been altered to demonstrate how interlocking of soft palate and epiglottis would occur and how fluid passes though faucium channels and around the epiglottis.

(Epiglottis was elevated using Photoshop)
Picture altered by elevating epiglottis even more to show direct link between nasal cavity and inlet to larynx.
Soft palate and epiglottis never touch in adult humans.

- Auditory canal / Eustachian tube
- Soft palate
- Posterior 1/3 of tongue is now anterior wall of oropharynx
- Neck of epiglottis
- Insertion of tongue on lingual aspect of the mandible.
Bubble Palates

• What are they?
• Do they interfere with breastfeeding?
Bubble palate in Dr. Crelin illustration.
Cadaver dissection with bubble palate.
A cadaver dissection showing a bubble palate.
Baby 1: Bubble palate (Genna)
Baby 1: Tongue-tied (Genna)
Baby 2: Bubble palate (Genna)
Baby 2 - Tongue-tied (Genna)
Why tight frenums can cause breastfeeding challenges.
Ankyloglossia and Breastfeeding

- Nipple trauma and pain
  - Compression against gum pad instead of tongue
- Inefficient, inadequate suckling, poor seal.
- Limited action of tongue / poor wave motion.
- Lengthy feedings.
- Failure to thrive.
- Often switched to bottle.
If tongue cannot extend past the bony gum pad (mandible), trauma to breast can occur.
3 month old who was weaned because of breastfeeding difficulties.
Age 4 months - Note lesion on frenum caused by teeth.
A44 Age 4 - Tight frenum - note pull on inside of lower jaw.
Tongue thrust due to being tongue-tied.
Facial form and dental occlusion prior to bottles and pacifiers.

Modern is not always better!
Indian skulls studied by Dr. Weston A. Price. Each skull has nice occlusion and no decay.

Peruvians studied by Dr. Weston A. Price showing off their smiles. Note nice “U” shaped arches and no decay.

Torres Strait natives studied by Weston A. Price showing off their beautiful smiles and teeth.

Prehistoric Native American skull evaluated at the Smithsonian.
Full “U” shaped palate of previous skull. No decay.
A52  Prehistoric Native American Indian skull from South Dakota
Ideal facial form and occlusion of a prehistoric skull at the Smithsonian.
Close up of teeth of previous skull. Perfect occlusion and no decay.
Prehistoric skull with wide palate and large posterior nasal aperture. There is also good width between the pterygoid plates. This allows for a wide beginning of the airway.
Prehistoric adult mandible with nice arch form and no decay.
A57  70,000 year old AMUD skull with nice occlusion and no decay.
Bottle feeding

Pacifiers

Infant habits
Tongue / teeth / cheeks are at rest in a “neutral” position. There are no abnormal forces within the mouth. This allows for the proper alignment of the teeth and dental arches.

This also allows for normal face development. Will discuss in following presentation on “long face syndrome”.
While at rest, the tongue does not exert abnormal forces on any of the structures within the oral cavity. The teeth remain in a stable position because they are in a “neutral zone” between the tongue and cheeks.
During breastfeeding, the breast (breast/nipple) adapts to the shape of the mouth. The peristaltic motion of the tongue during breastfeeding, presses the breast up against the palate.
A vacuum can create an inward collapse of the oral cavity, throat and airway.
The mouth has to adjust to any object in the mouth other than the breast. The unnatural forces that can develop can impact the position of the teeth and shape of the palate. Muscle forces always win out over bone. - e.g.- teeth will be moved.
Bottle feeding can separate the epiglottis/soft palate connection, elevate the soft palate, drive the tongue back and alter the action of tongue.
Upward forces on palate and vacuum can alter oral development.
High palate / narrow arch
Previous models placed together. The result is a cross-bite malocclusion.