Position and action of the tongue during breastfeeding.
Cadaver dissection demonstrating the natural anterior resting position of the tongue of a newborn.
Illustration from Ros Escott article, Positioning, Attachment and Milk Transfer, Breastfeeding Review, 1989, p.35.
Demonstrates position and action of tongue during breastfeeding (Woolridge)
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.
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.
Forces generated during:

- Bottle feeding
- Pacifier use
- Infant habits
Bottle feeding can separate the epiglottis/soft palate connection, elevate the soft palate, drive the tongue back and alter the action of tongue.
Vacuum

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.
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.
Severe malocclusion - severe OSAS
Factor in OSA - Macroglossia or large tongue
Her original home made appliance.
Front side of home made appliance.
History of Infant Feeding
Infant nursing on a goat.

Breasts Bottles & Babies - a history of infant feeding. Valerie Fildes
Infants being suckled by asses kept at the Hospital for Sick Infants in Paris - until early 20th Century.
1770-1800 AD - Newly invented glass feeding bottle...screw top with sponge for sucking.

(Precursor to “modern” bottles)

“How to use the newly invented feeding bottle of F. Baldini”, 1784.

Breasts Bottles & Babies - a history of infant feeding. Valerie Fildes
Glass nursing bottle with pewter nipple - hand painted - 1770s

Hashinger family heirloom nursing bottle, produced in Mannheim, Pennsylvania in the early 1770s. Made at the Steigel Glass Works, this bottle is hand-painted and has a pewter nipple.
Glass nursing bottle with pewter nipple - mid 19th Century

C25
“Bubby pot” - 18th Century - Like a straw - hole opens into bottom of pot

C26
Cup feeder - Early 20th Century.
Early feeding vessel for infants.
Habits and malocclusion

- Thumb sucking
- Finger sucking
- Lip sucking
- Arm sucking
- Pacifiers
Thumb sucking
Thumb sucking fetus - learns how to suck / pacify.
EXCESSIVE digit sucking can set up abnormal forces on the oral cavity and surrounding structures.
Intense thumb sucker.
Retruded chin and elevated upper lip is a result of his lip sucking.
Thumb sucking created this open bite.
Thumb sucking created this tongue thrust..
Finger sucking
2-digit-sucker and hair twister.
Position of fingers while she sucked.
Finger sucking created this tongue thrust.
Finger sucking caused this open bite.
Lip sucking
Facial view of this lip sucker.
Close up of child sucking on his lower lip.
Lip sucking caused this open bite.
Lip sucking caused this tongue thrust.
Arm sucking
Patient who was an arm sucker.
Scar on arm due to arm sucking long after habit stopped
Malocclusion that resulted from arm sucking
She had to wear this palate expander to correct her malocclusion.
She needed orthodontics to correct her malocclusion.
Best part of treatment - Kansas University JayHawk retainer.
Excessive sucking is what causes the damage.

**Excessiveness** =

Intensity + Frequency + Duration
Labbok / Hendershot article:

- **Principle finding** - the longer the duration of breastfeeding, the lower the incidence of malocclusion.
- Bottle feeding leads to a habit of forward tongue thrusting and a weakened development of the orbicularis muscles.
- There is a significant decrease in tongue thrusting with an increased duration of breastfeeding.

Pacifiers

- Positive association between pacifiers use and posterior cross bite and reduced upper arch width.

- Probable mechanism
  - Sucking activity in the cheeks
  - Reduced palatal support as the tongue takes a lower position

Habits and malocclusion

• Dummy and digit sucking strongly associated with malocclusion.

• Malocclusions found in 35% of 3-year-olds
  – Anterior open bites in 27%
  – Unilateral cross bites in 8%

Habits and malocclusion

- Digit and dummy sucking resulted in increased tendency to tongue thrust.
- Tongue thrust related to: open bite, cross bite, overjet, Class II malocclusion.
- Sucking habits influence etiology of malocclusion.

Sucking habits and malocclusion

- Digit and dummy-sucking was the lowest among children who had good opportunity for breastfeeding.
- Significant relationship was found between sucking habits and malocclusion such as: Class II malocclusion, increased overjet, anterior open bite.

Bottle feeding and malocclusion

• There is a strong association (p=0.0006) between exclusive bottle-feeding and malocclusion.

• This mal-relationship does not diminish as the child grows from the primary to permanent dentition.

Swallow

Thrust

Facial form
The Basics of Swallowing

Test yourself!
Tip of tongue positioned behind upper front teeth during “N” sound.
Peristaltic motion of tongue across roof of mouth during swallow
Consequences of not having a correct swallowing pattern.

Abnormal swallowing pattern.

Tongue thrusting.
Infant tongue thrust and resultant anterior open bite. In this case the tongue thrust was due to a tight frenum.
Tongue thrust with resultant anterior open bite malocclusion.
Adult tongue thrust created anterior open bite.
Adult tongue thrust created anterior open bite and caused gingival recession.
Tongue thrust caused open bite malocclusion.
Adult tongue thrust created spaces and significant malocclusion.
Post ortho open bite - 2 bicuspids removed.
Actual tongue thrust and open bite of study model case. An orthodontic failure because the tongue thrust was not addressed.
The case that started my research about 30 years ago. She is still a patient in my practice. Patient has a posterior bilateral tongue thrust.
Posterior open bite on right side due to a posterior tongue thrust.
Posterior open bite on left side due to a posterior tongue thrust.
Swallowing dysfunction was more than seven times as frequent among patients with snoring and sleep apnea as it was among controls.

Facial Form

Breastfed baby

vs.

Bottle-fed / thumb sucking baby
Natural beauty has a Divine / Golden proportion ratio of $1.618 / 1.0$

Two-year-old breastfed infant with divine proportion of the face.

Same breastfed infant at age 3 years-4 months. Note nice facial form and lip contour / shape.
Adult who was breastfed as a child. She would not touch a bottle or pacifier. A pretty proportional face.
Same adult with beautiful smile and teeth. Never had orthodontics (braces).
Lip contour of 4 month old breastfed infant

Same infant at 4 1/2 years. Note natural lip line
Note collapse of cheeks and bottle due to vacuum created during excessive sucking.
Aggressive thumb sucker at 4 months.

Lip contour and tongue position of same aggressive thumb sucker when thumb removed. (4 months)
Same patients at 4 1/2 years of age. Note lip contour and forward position of tongue at rest.
Same patient at age 7 years  Note long face and open mouth.
Open bite on same 7 year old. Note forward position of tongue.

Compromised oropharynx (throat) of same 7 year old.
Lip and Facial Contours

Infant exclusively breastfed

Infant who has sucked on a foreign object excessively