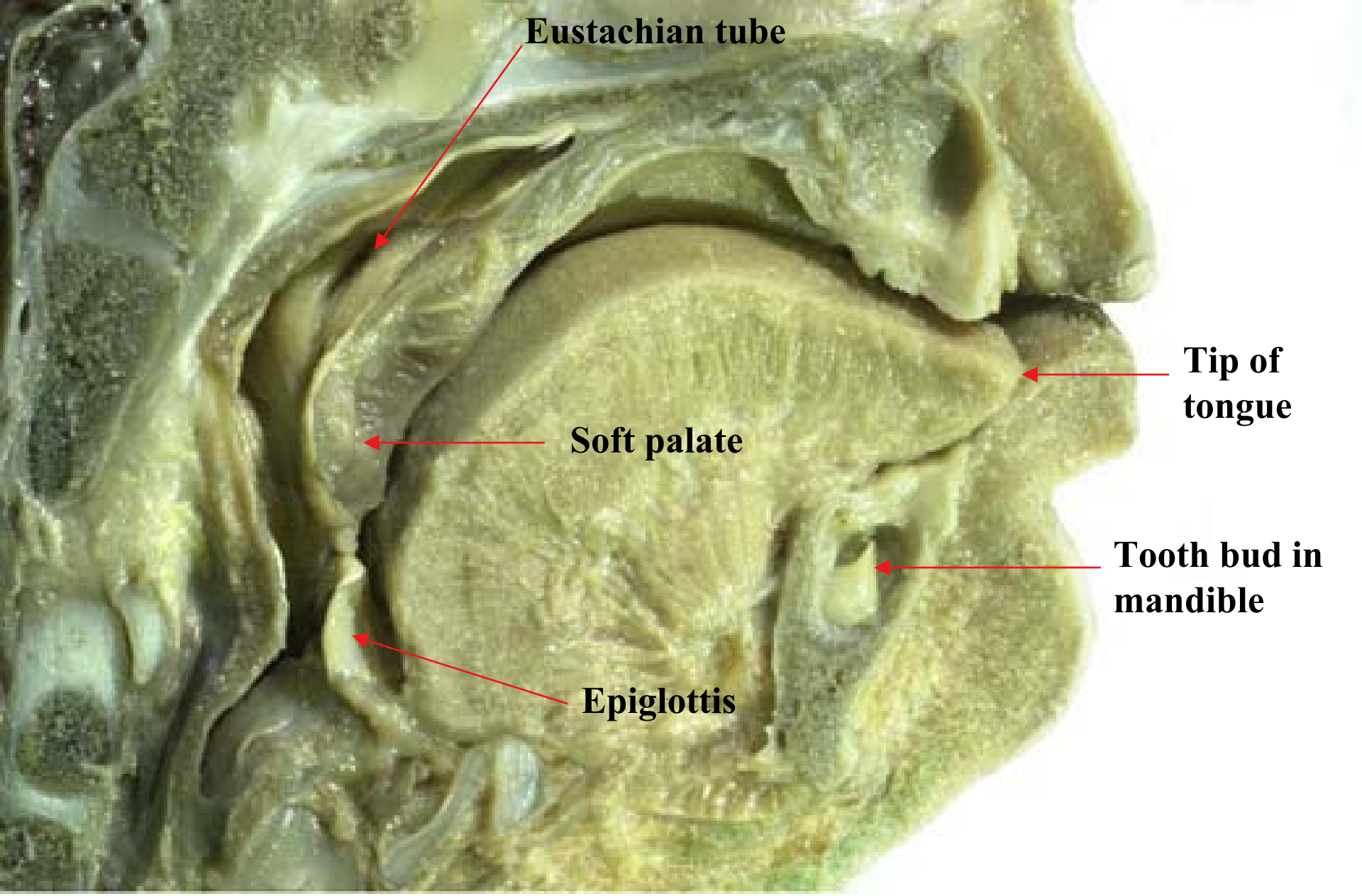
Position and action of the tongue during breastfeeding.

Warning - 1

C1



Cadaver dissection demonstrating the natural anterior resting position of the tongue of a newborn.

C2

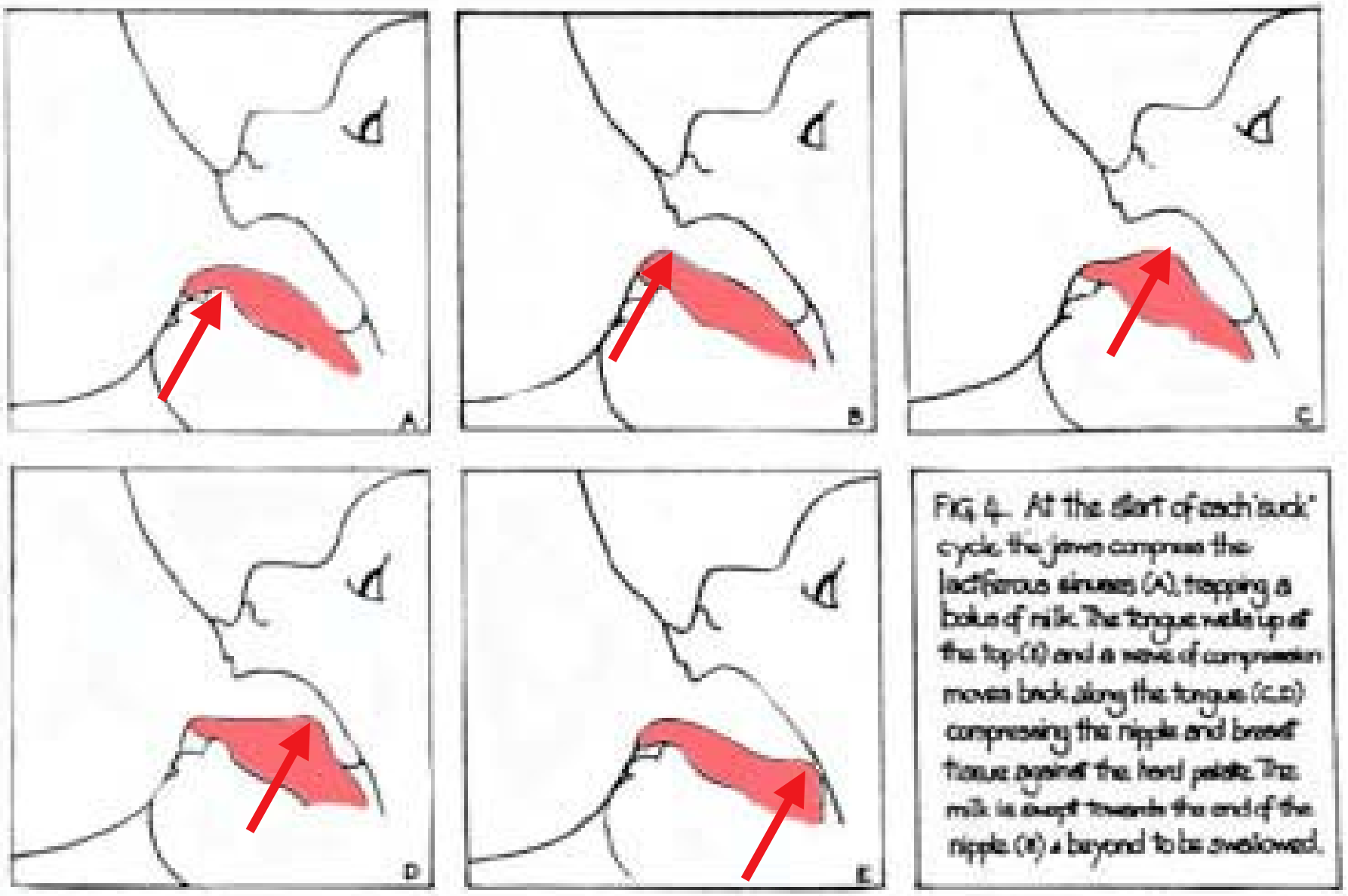
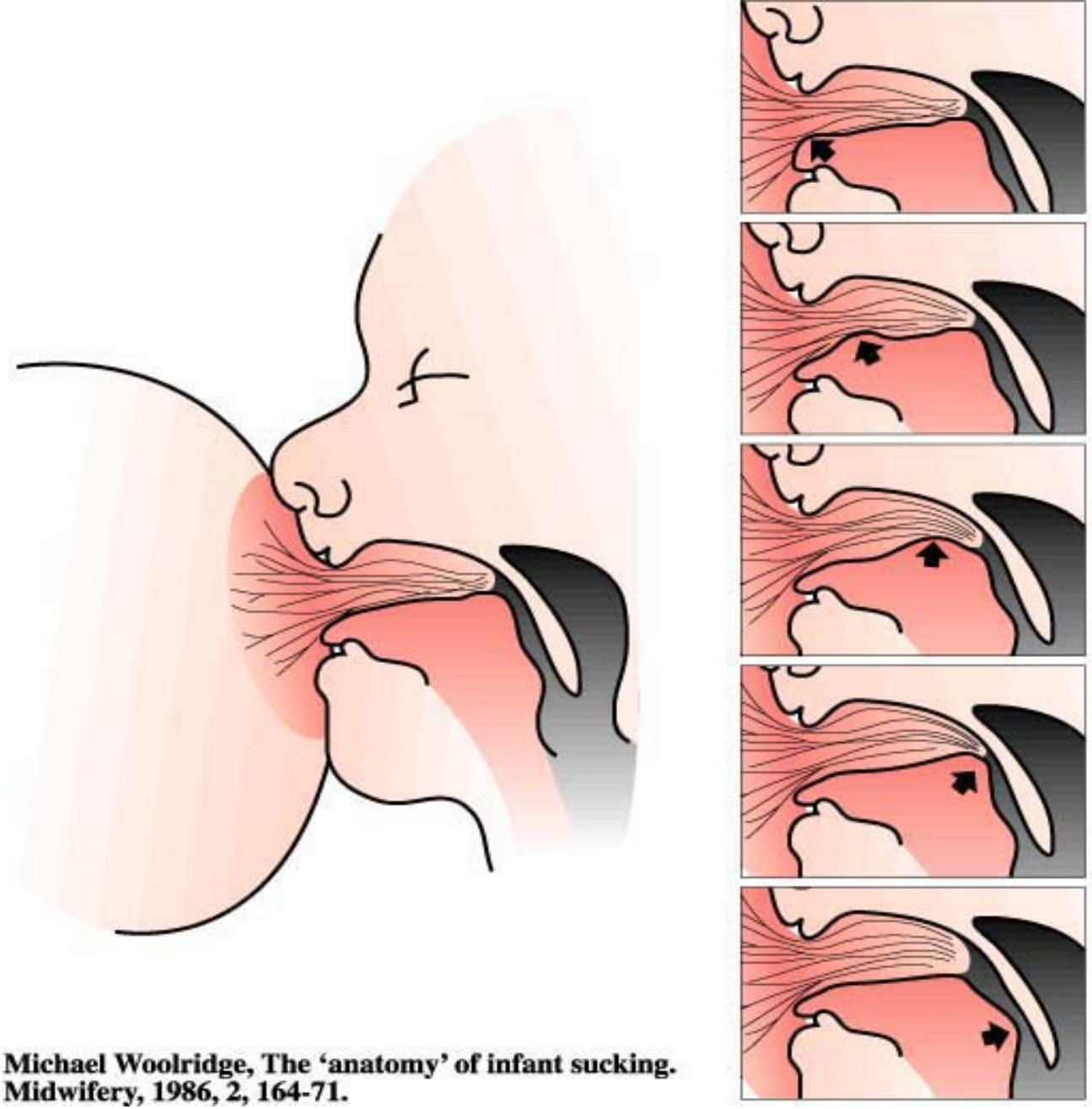


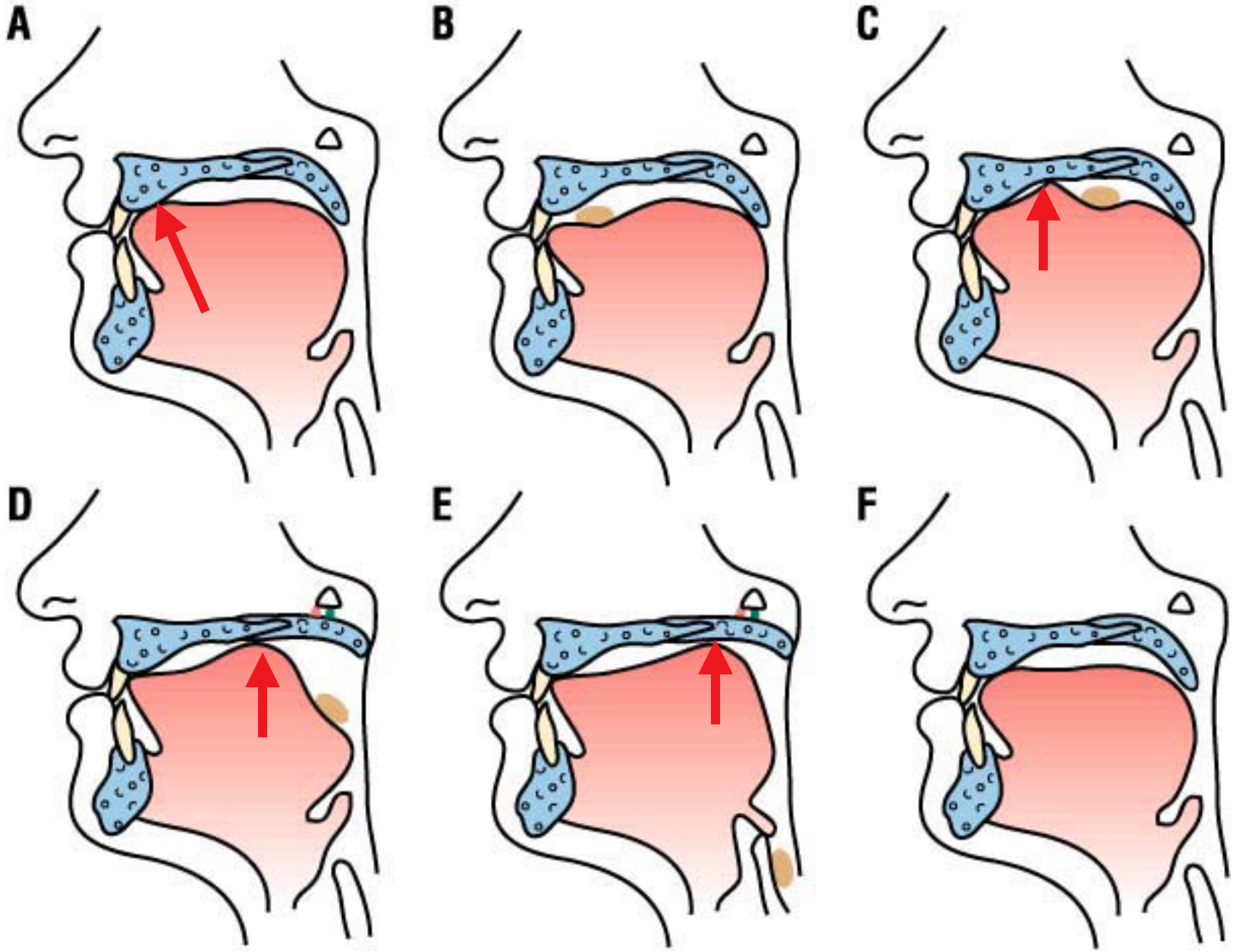
Illustration from Ros Escott article, Positioning, Attachment and Milk Transfer, Breastfeeding Review, 1989, p.35.



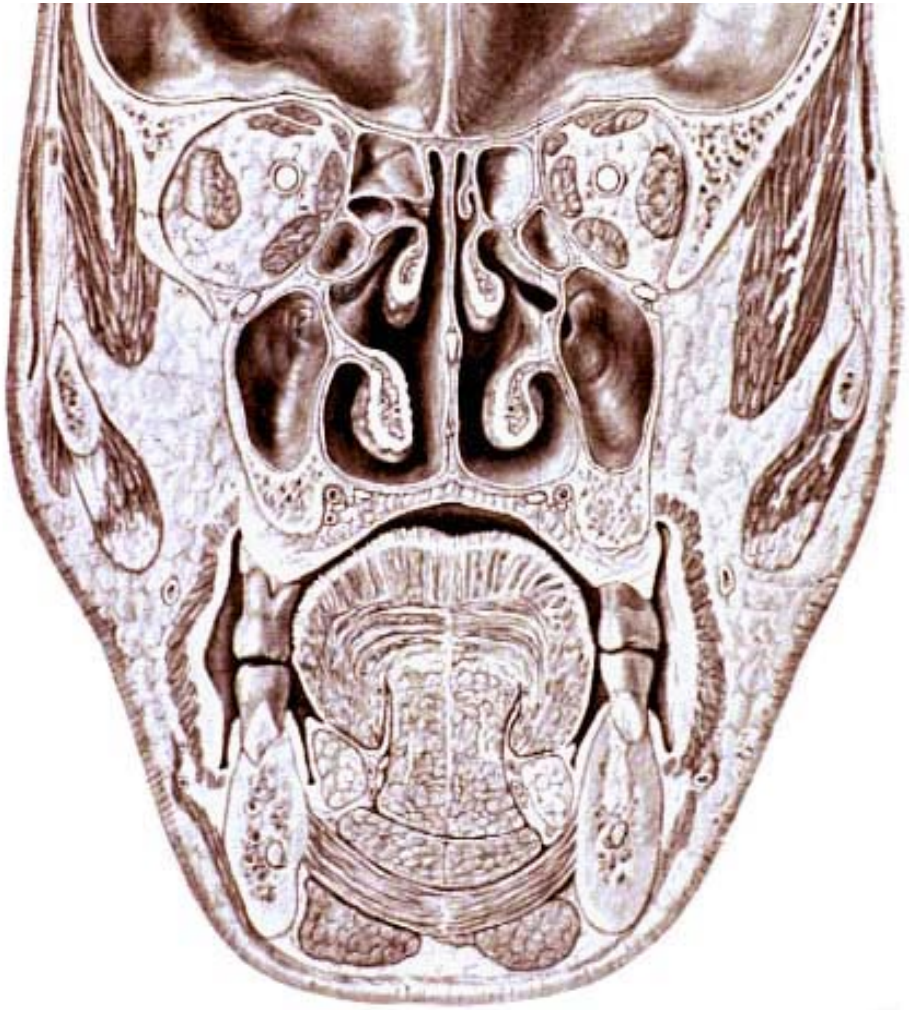
Michael Woolridge, The 'anatomy' of infant sucking.
Midwifery, 1986, 2, 164-71.

C4 Demonstrates position and action of tongue during breastfeeding (Woolridge)

Adult Swallow



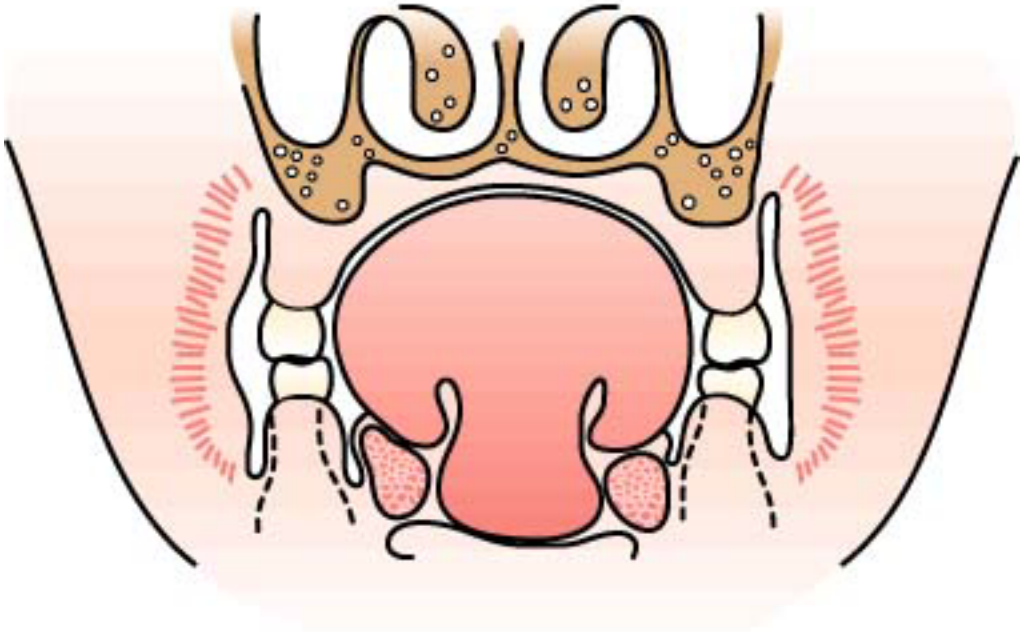
C5



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.

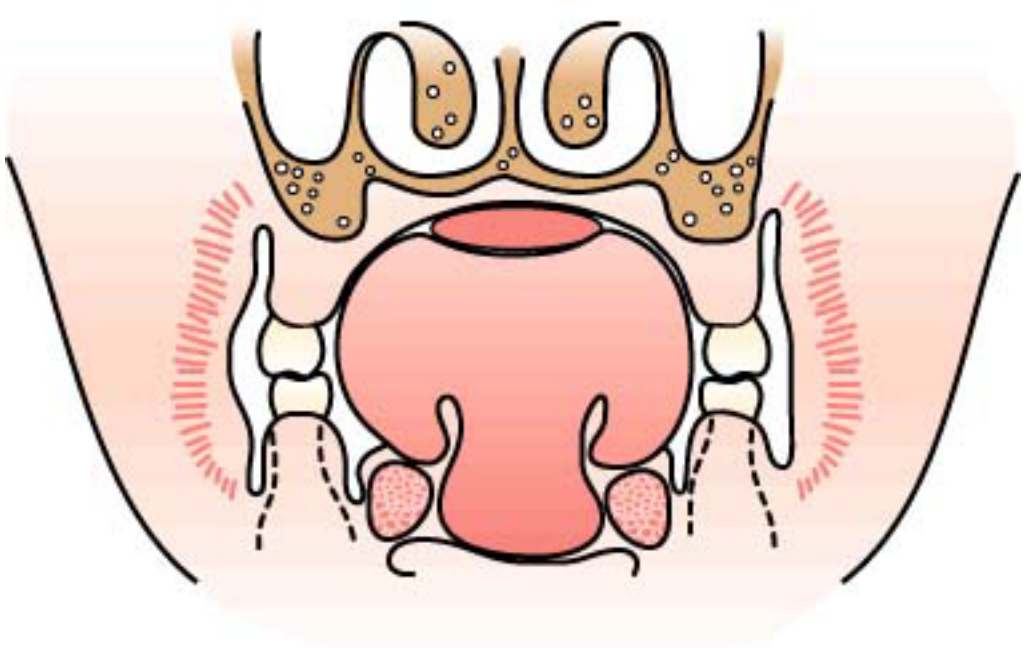
This also allows for normal face development.

Tongue at Rest



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.

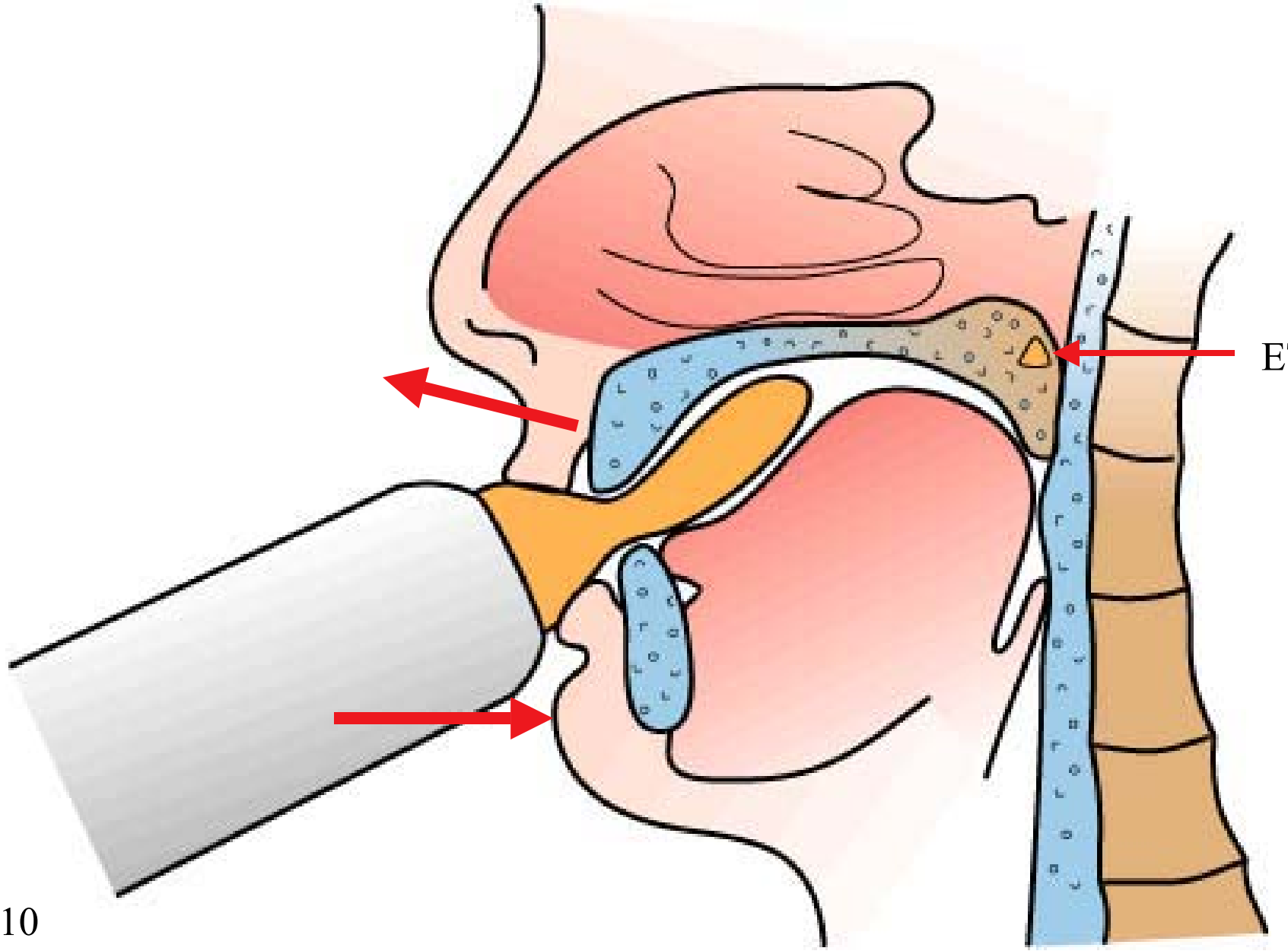
Tongue Position While Breastfeeding



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



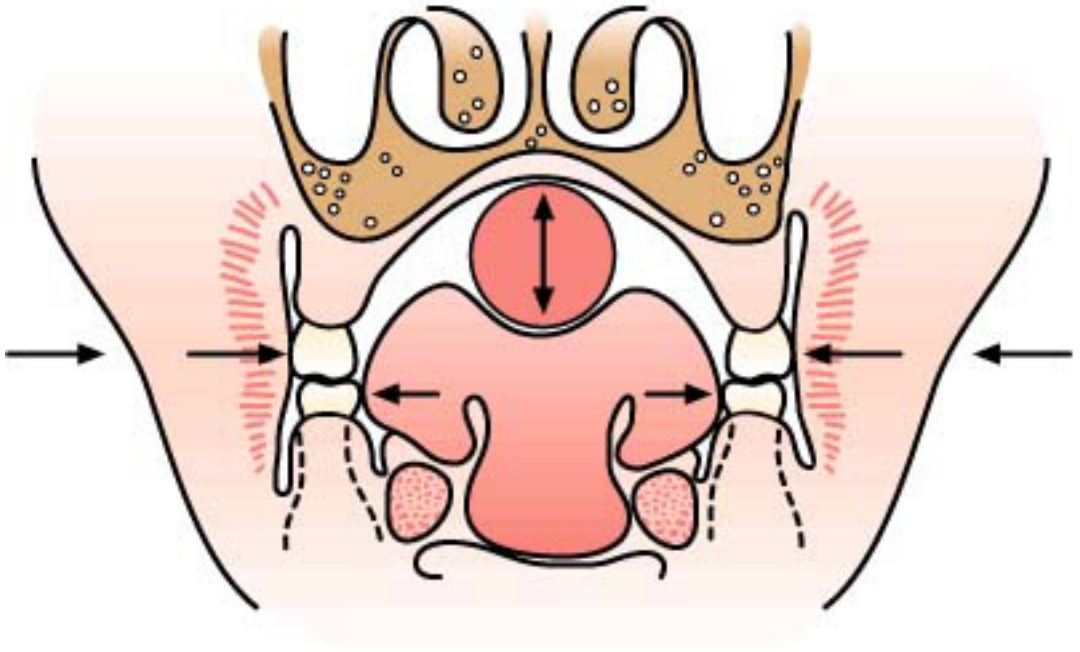
C10

Bottle feeding can separate the epiglottis/soft palate connection, elevate the soft palate, drive the tongue back and alter the action of tongue.

Vacuum

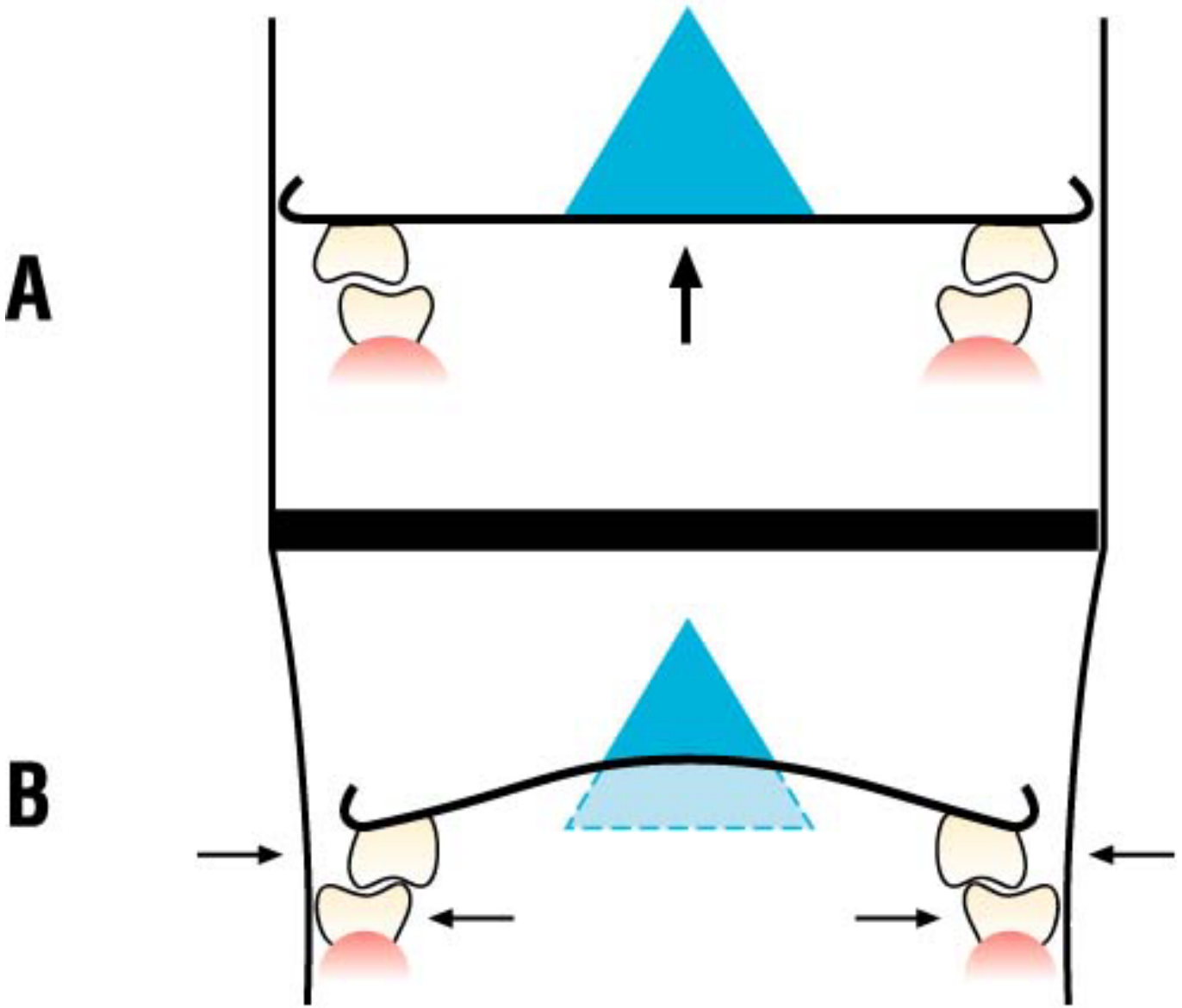
A vacuum can create an inward collapse of the oral cavity, throat and airway.

Pacifier / Bottle Nipple



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.

Palate Formation



Upward forces on palate and vacuum can alter oral development.

High palate / narrow arch

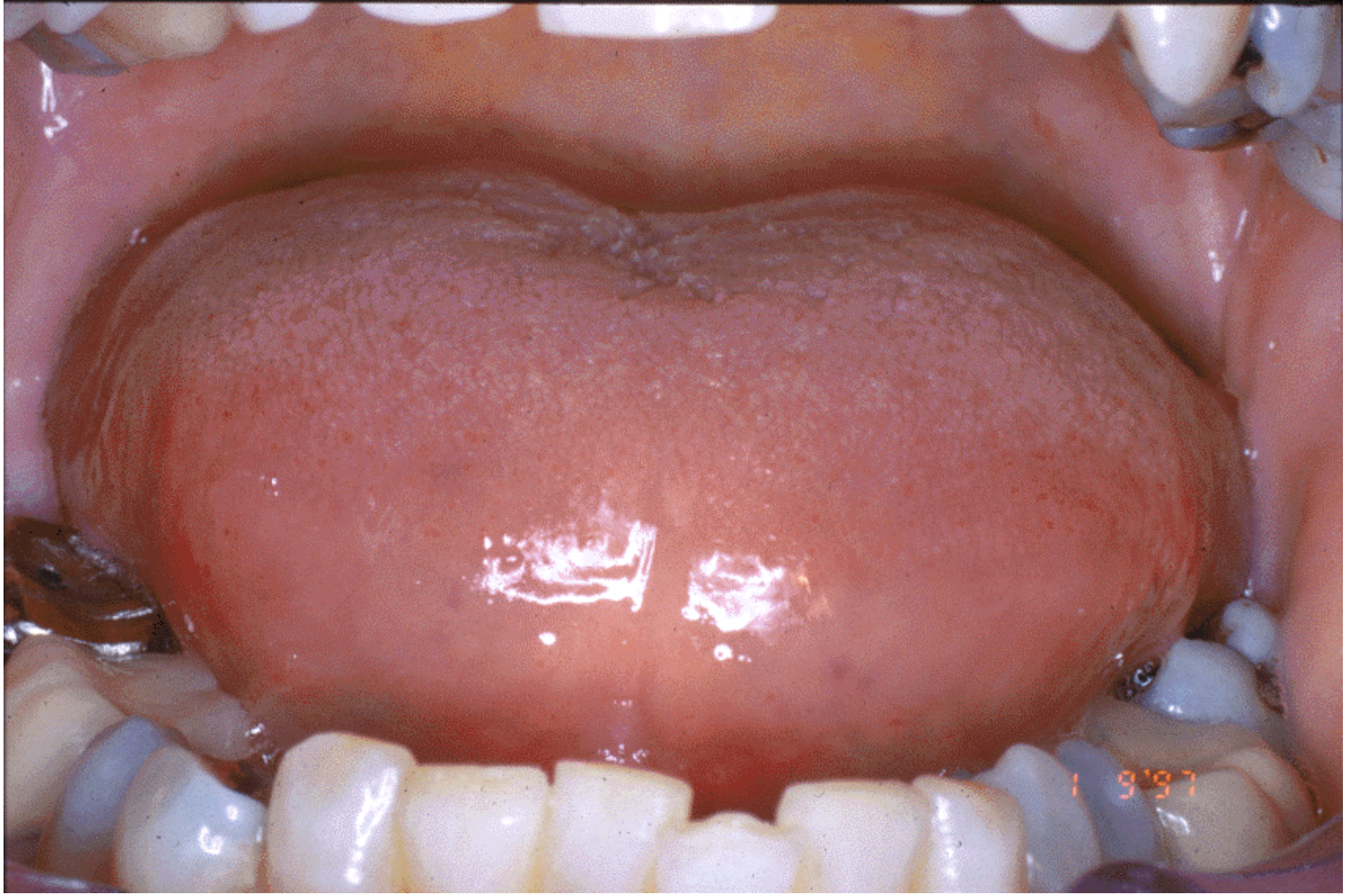
C14

Previous models placed together. The result is a cross-bite malocclusion.

C15

C16

Severe malocclusion - severe OSAS



Factor in OSA - Macroglossia or large tongue

C17

Her original home made appliance.

C18

Front side of home made appliance.

C19

History of Infant Feeding

Infant nursing on a goat.

Breasts Bottles & Babies *- a history of infant feeding.* Valerie Fildes

C21

Breasts Bottles & Babies *- a history of infant feeding.* Valerie Fildes

C22

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)

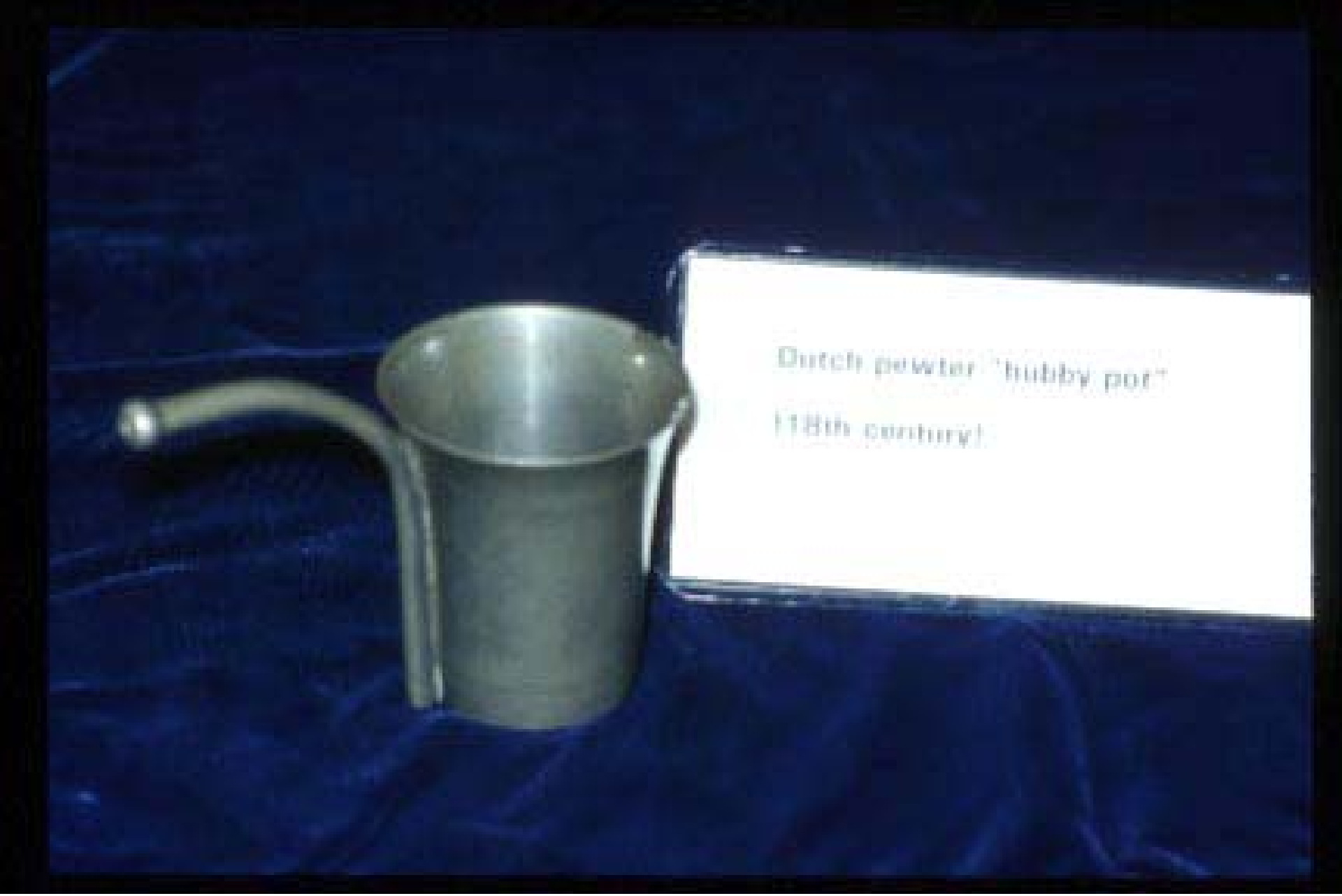
Breasts Bottles & Babies *- a history of infant feeding.* Valerie Fildes

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

C24 Glass nursing bottle with pewter nipple - hand painted - 1770s

Glass nursing bottle with pewter nipple - mid 19th Century

C25



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

C26

C27

Cup feeder - Early 20th Century.

Early feeding vessel for infants.

C28

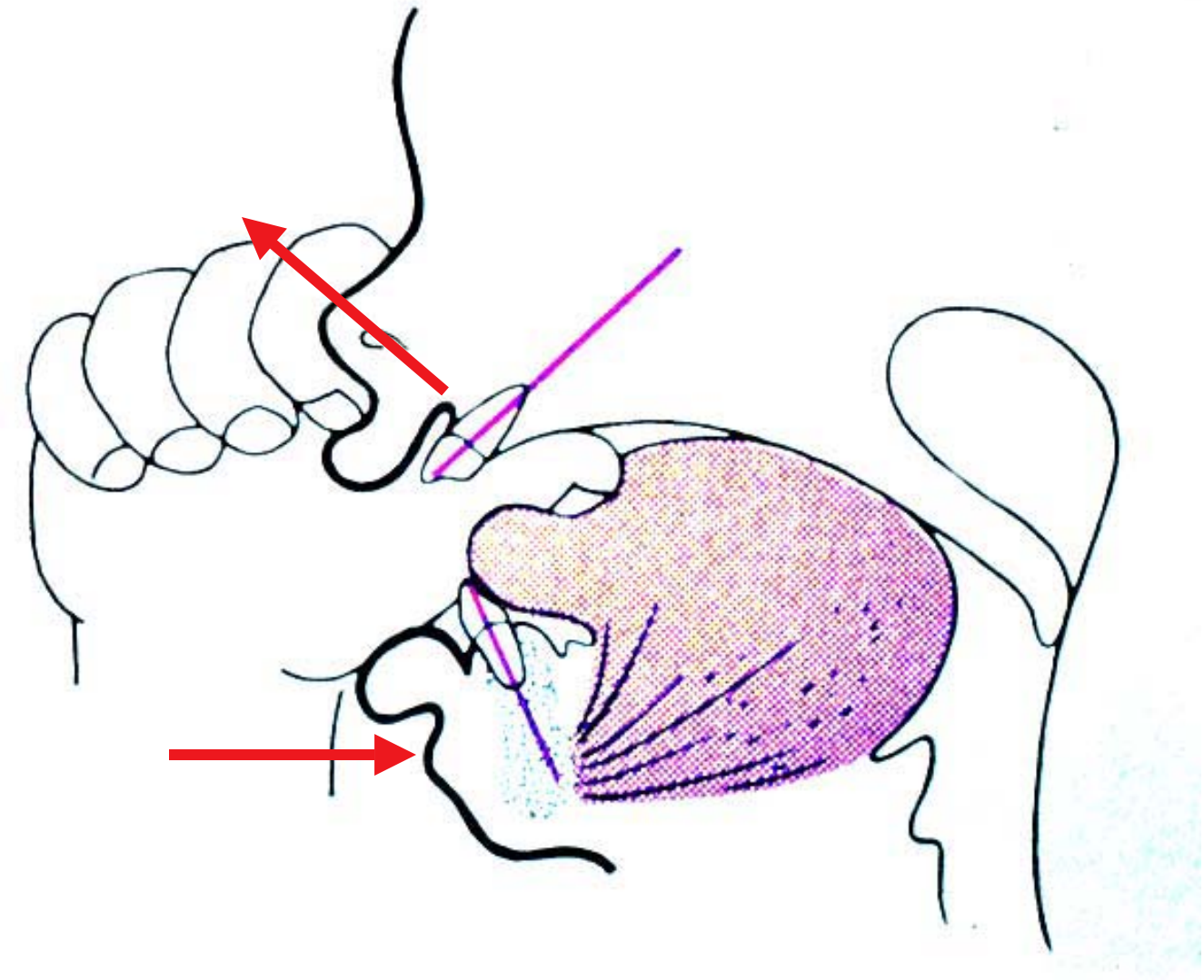
Habits and malocclusion

- Thumb sucking
- Finger sucking
- Lip sucking
- Arm sucking
- Pacifiers

Thumb sucking

Thumb sucking fetus - learns how to suck / pacify.

C31



EXCESSIVE digit sucking can set up abnormal forces on the oral cavity and surrounding structures.

Intense thumb sucker.

C33

C34 Retruded chin and elevated upper lip is a result of his lip sucking.

Thumb sucking created this open bite.

C35

Thumb sucking created this tongue thrust..

C36

Finger sucking

2-digit-sucker
and hair twister.

C39 Position of fingers while she sucked.

Finger sucking created this tongue thrust.

C40

Finger sucking caused this open bite.

C41

Lip sucking

Facial view of this lip sucker.

Close up of child sucking on his lower lip.

C44

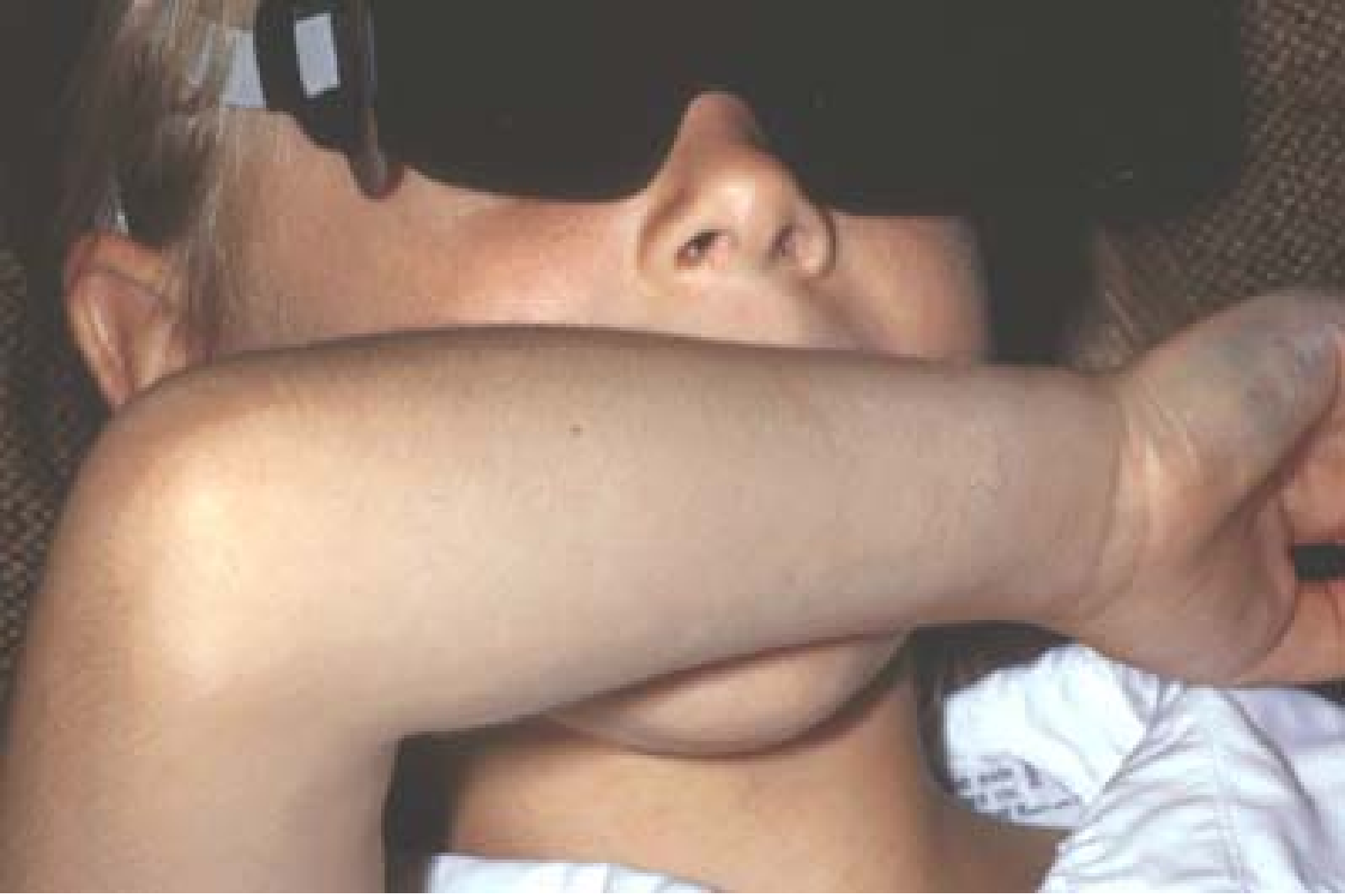
Lip sucking caused this open bite.

C45

Lip sucking caused this tongue thrust.

C46

Arm sucking



Patient who was an arm sucker.

C48

C49 Scar on arm due to arm sucking long after habit stopped

C50

Malocclusion that resulted from arm sucking

C51 She had to wear this palate expander to correct her malocclusion

C52 She needed orthodontics to correct her malocclusion.

Best part of treatment - Kansas University JayHawk retainer.

C53

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 .

Labbok M et al. Does breast-feeding protect against malocclusion? Am J Prev Med, 1987;3(4):227-32

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

Ogaard B, Larsson E, Lindsten R. The effect of sucking habits, cohort, sex, intercanine arch widths, and breast or bottle feeding on posterior cross bite in Norwegian and Swedish 3-year-old children Am J Orthod Dentofac Orthop 1994;106:161-6..

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%

Paunio P, Rautava P, Sillanpaa M, The Finnish family competence study: The effects of living conditions on sucking habits in 3-year-old Finnish children and association between these habits and dental occlusion. Acta Odontol Scand 1991;51:23-29

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.

Melsen, B, Stensgaard K, Pedersen J. Sucking habits and their influence on swallowing pattern and prevalence of malocclusion. Euro J Othodont 1979;1(4):271-280.

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.

Farsi N, Salama F, Pedro C. Sucking habits in Saudi children: prevalence, contributing factors and effects on the primary dentition. Pediatr Dent 1997;19(1):28-33

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.

Davis D, Bell P. Infant feeding practices and occlusal outcomes: A longitudinal study. J Can Dent Assoc 1991;57(7):593-94

Swallow

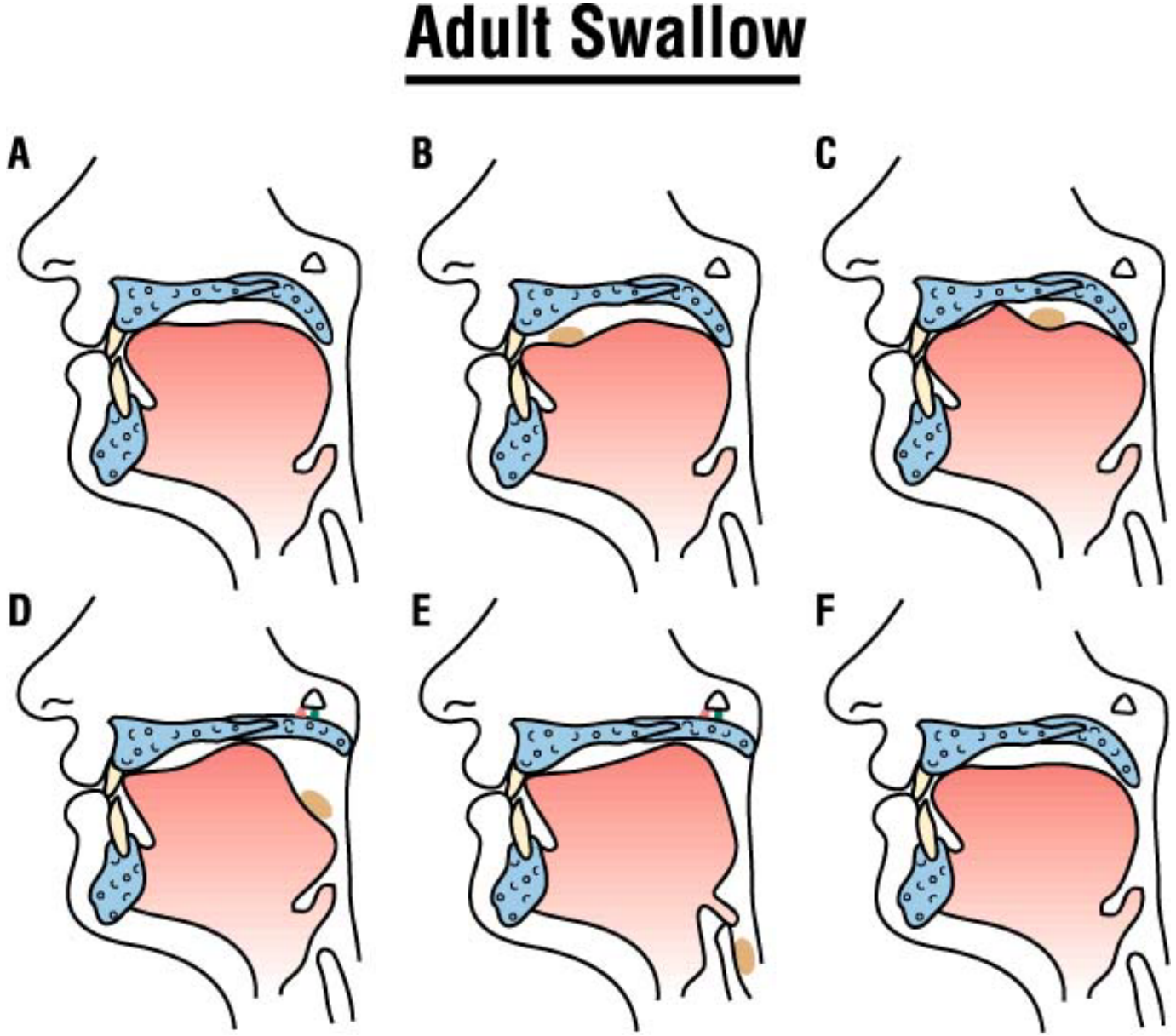
Thrust

Facial form

The Basics of Swallowing

Test yourself!

C63 Tip of tongue positioned behind upper front teeth during “N” sound.



Peristaltic motion of tongue across roof of mouth during swallow

C64

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.

C66

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.

C69

Tongue thrust caused open bite malocclusion.

C70

Adult tongue thrust created spaces and significant malocclusion.

C71

C72 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.

C73

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**.

C74

Posterior open bite on right side due to a posterior tongue thrust.

C75

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.

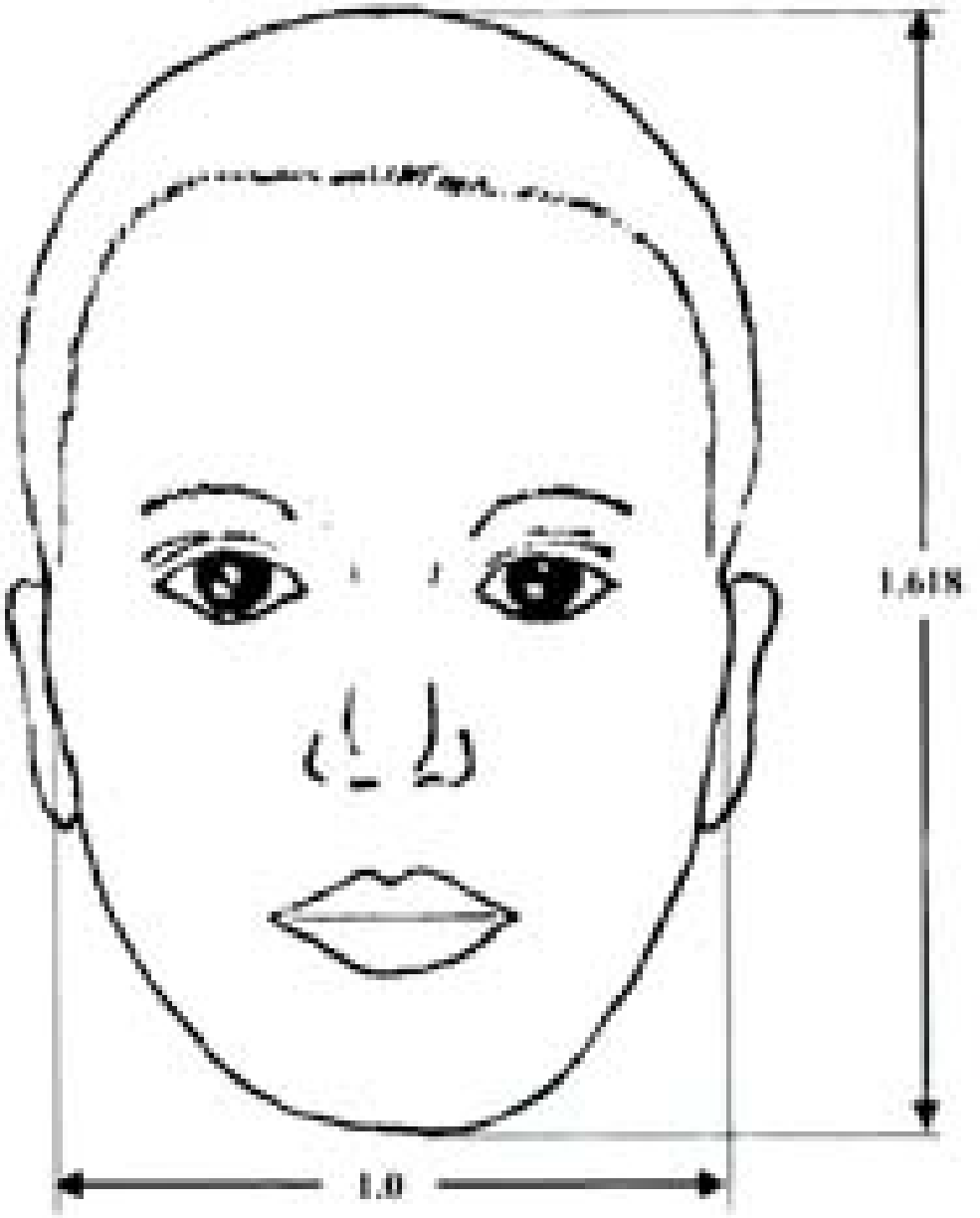
Jaghagen EL, Snoring, sleep apnoea and swallowing dysfunction: a videoradiographic study. Dentomaxillofacial Radiology, 2003 Sept;32(5):311-16.

Facial Form

Breastfed baby

vs.

Bottle-fed / thumb sucking baby



Divine Proportion of the face

Natural beauty has a Divine / Golden proportion ratio of 1.618 / 1.0

Yosh Jefferson. Skeletal Types: Key to unraveling the mystery of facial beauty and its biologic significance. JGO 1996;7(2):7-25.

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).

C82

Lip contour of 4 month old breastfed infant

Same infant at 4 1/2 years. Note natural lip line

C8

Note collapse of cheeks and bottle due to vacuum created during excessive sucking.

C84

Aggressive thumb sucker at 4 months.

Lip contour and tongue position of same aggressive thumb sucker when thumb removed. (4 months)

C85

Same patients at 4 1/2 years of age. Note lip contour and forward position of tongue at rest.

C86

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