

This is a handout for the presentation:

The Myth that Pacifiers Reduce the Risk of SIDS.

The handout can be downloaded and used to follow along with the presentation that is in a format that lets you watch and listen as though you were in a lecture.

The first half of the presentation discusses the Myth that Human Breastmilk Causes Dental Decay.

See next slides for more information

Name of presentation:

XL17: Breastfeeding/Infant Caries and the Pacifier/SIDS Issues

Synopsis: Discussion of the myths that breastfeeding causes dental decay and pacifiers reduce the risk of SIDS.

CERPs: 1.0 L CERP. CERPs awarded for Lactation Consultants and CHs (Contact Hours) for USA Nurses.

Fee: \$15.00 (Also included is presentation on the Myth that Breastfeeding Causes Dental Decay)

Access period: One week from the time of enrollment.

Lecture recorded at GOLD09 online conference.

Links for information on how to enroll, view presentation and get CERPs for Lactation Consultants and CEUs for USA Nurses:

Link to presentation and Experts-in-Lactation Lectures:

(Dr. Palmer has 2 presentations listed on this site)

<http://health-e-learning.com/courses/experts-in-lactation>

Description of course:

<http://health-e-learning.com/courses/experts-in-lactation/125-x117>

Register for course:

http://my.summitzero.com/index.php?option=com_giftshop&task=viewClient&clientId=1

GOLD09 Conference

Myth of the day:

Pacifiers reduce the risk of SIDS!

May 2009

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“The Myth” that pacifiers reduce the risk of SIDS

Documentation demonstrates that pacifier
usage can actually increase the risk of SIDS!

Research by McGarvey et al. in 2003 showed that
“77% of SIDS cases habitually used a soother”

Order of presentation

- Introduction to SIDS.
- Basics of anatomy.
- Review of forces generated by pacifiers.
- Introduction to “The Issue”.
- Principles on which the Policy is based.
- My opinion.

Definition of SIDS:

“The sudden death of an infant under 1 year of age, which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history.”

Key Point: With better investigations, more understanding and awareness of SIDS, there are now fewer ‘unexplained’ deaths!

The Changing Concept of Sudden Infant Death Syndrome: Diagnostic Coding Shifts, Controversies Regarding the Sleeping Environment, and New Variable to Consider in Reducing Risk. Pediatrics Nov 2005;116(5):1245-55.

SIDS is a multifactorial condition
caused by:

- Maturation process
- Medical conditions
- Environmental factors

Kahn A, et al. *Sudden infant deaths: from epidemiology to physiology*.
Forensic Science International 2002; 130S:S8-S20. (Belgium)

Facts about SIDS

SIDS is the leading cause of death in infants between 1 month and 1 year of age.

Most SIDS deaths happen when babies are between 2 months and 4 months of age.

Most SIDS deaths occur in the later part of the night.

Limitations of this presentation.

Full-term, healthy babies!

Only covers SIDS from an
anatomical perspective.

The possible misinformation in
the research data.

Policy Statement of American Academy of Pediatrics

“Until evidence dictates otherwise, the task force recommends use of a pacifier through the first year of life according to the following procedures:”

The pacifier should be used when placing the infant down for sleep and not be reinserted once the infant falls asleep. If the infant refuses the pacifier, he or she should not be force to take it.

For breastfed infants, delay pacifier introduction until 1 month of age to ensure that breastfeeding is firmly established.

The Changing Concept of Sudden Infant Death Syndrome: Diagnostic Coding Shifts, Controversies Regarding the Sleeping Environment, and New Variable to Consider in Reducing Risk. Pediatrics Nov 2005;116(5):1245-55.

Basic anatomy of the throat #101

The difference between the throats of newborns, adults and other mammals.

Caution

There are some actual cadaver dissections in this presentation!

All mammals, including humans, are anatomically designed at birth, to breastfeed!

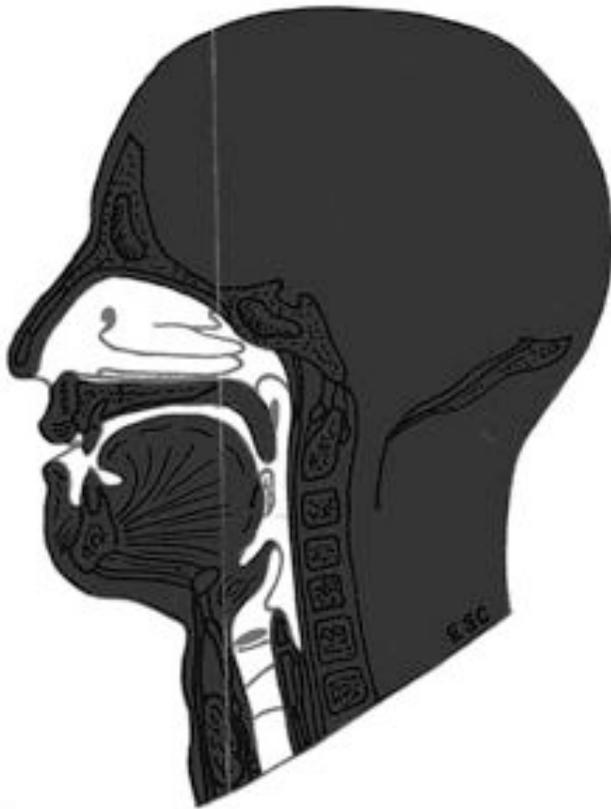
It was Dr. Crelin who inspired me to get involved in doing this research and in dissections.

Edmund S. Crelin, Ph.D., D.Sc.

- Faculty member at Yale for 37 years (1951-1988).
- Professor of Anatomy, Dept. of Surgery.
- Chairman: Human Growth & Development.
- Author of 168 research articles.
- Author of 3 books.
- Author of 5 CIBA Clinical Symposia.
- 3 awards at Yale as “outstanding teacher”.

THE HUMAN VOCAL TRACT

ANATOMY, FUNCTION,
DEVELOPMENT, AND EVOLUTION

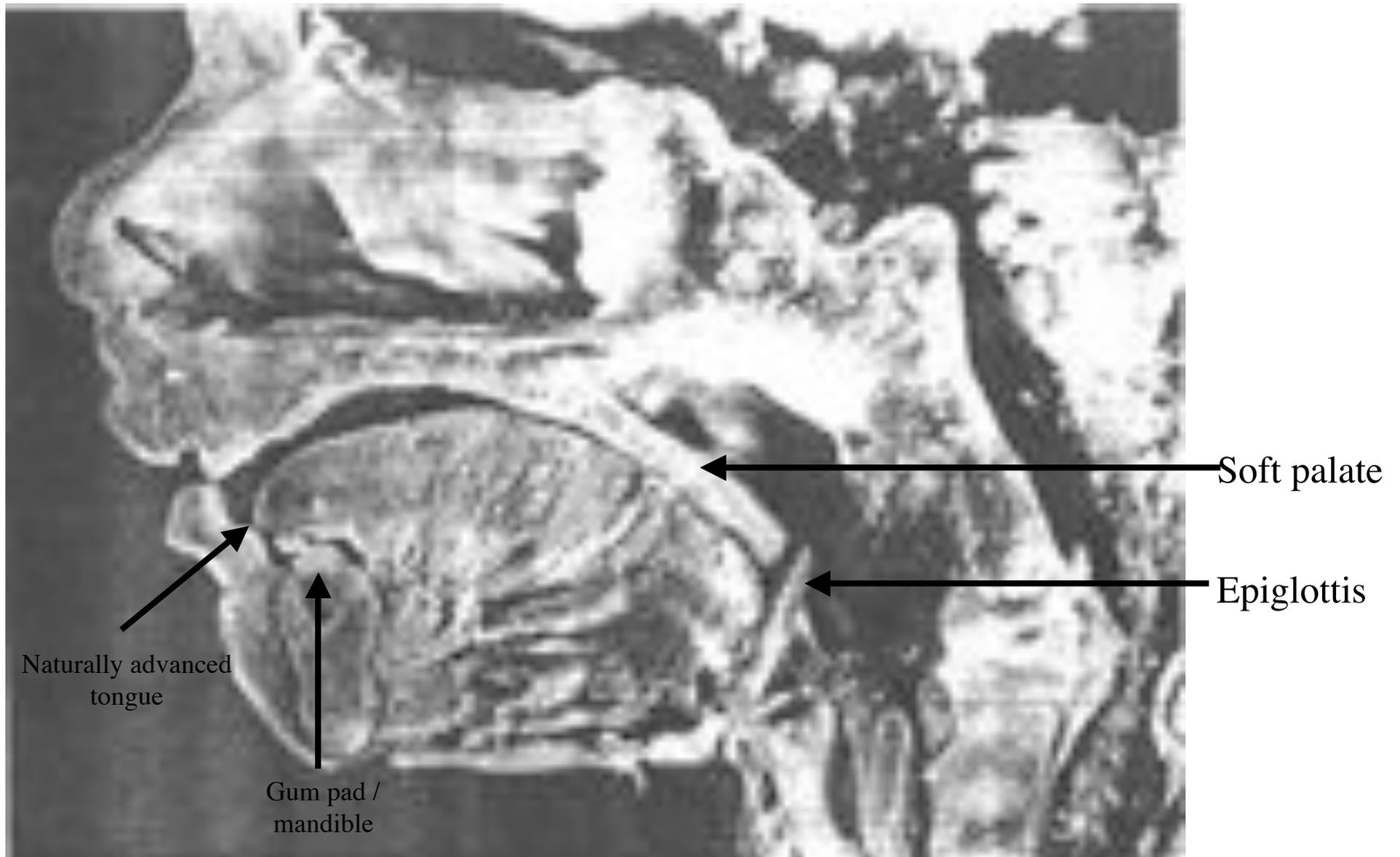


Edmund S. Crelin, Ph.D., D.Sc.

I felt honored when he sent
me an autographed book.

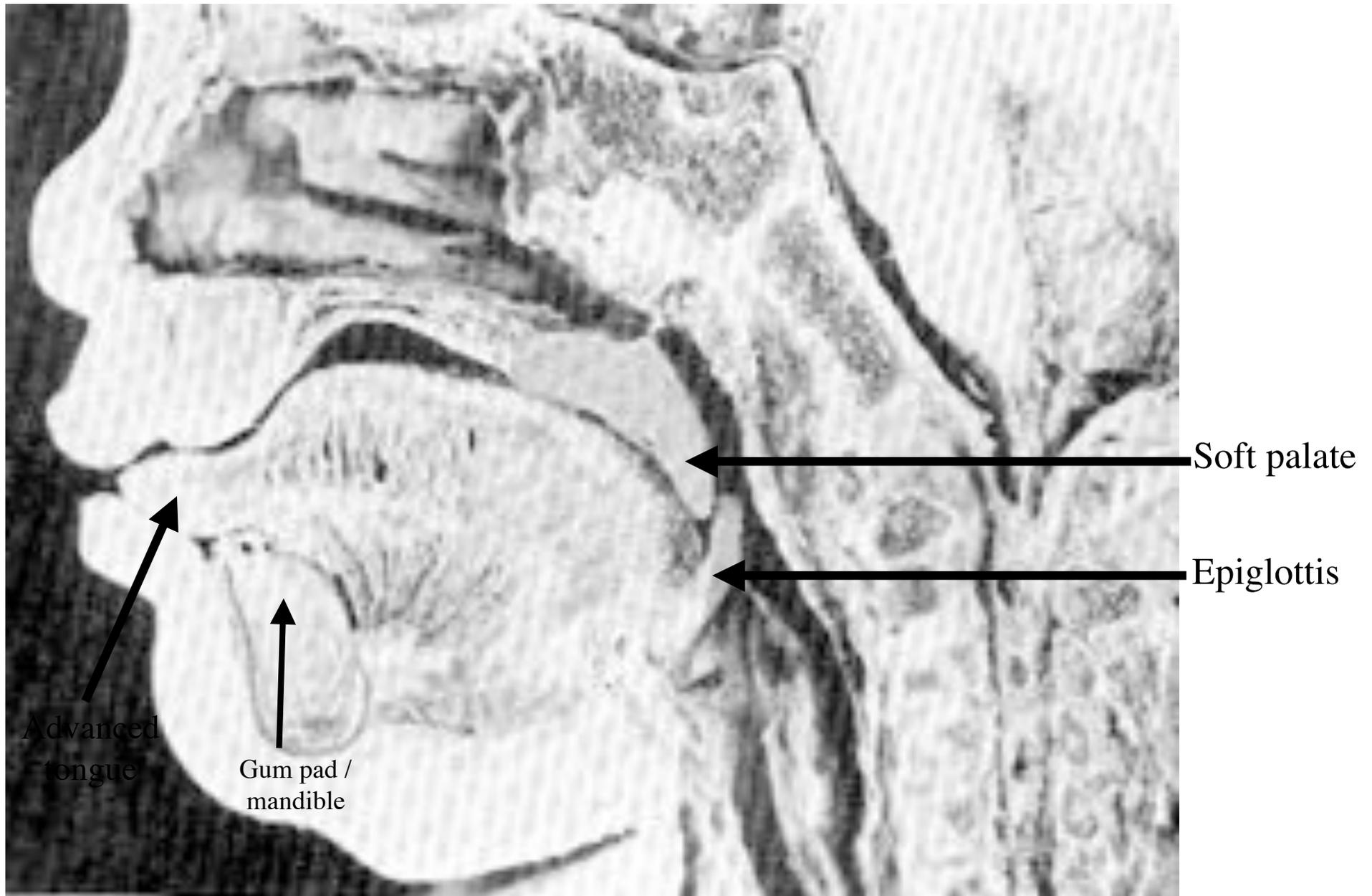
Best Wishes to
Dr. Brian Palmer!
E.S. Crelin

Edmund S. Crelin. The Human Vocal Tract,
1987. Vantage Press ISBN:0-533-06967-X



The tongue is naturally advanced past the lower gum pad and the epiglottis is in direct contact with the soft palate.

(Edmund S. Crelin. The Human Vocal Tract, 1987. Vantage Press ISBN:0-533-06967-X)



Different case.

(Edmund S. Crelin. The Human Vocal Tract, 1987. Vantage Press ISBN:0-533-06967-X)

During the act of breastfeeding, the tongue naturally extends forward over and past the lower gum pad (jaw / mandible).

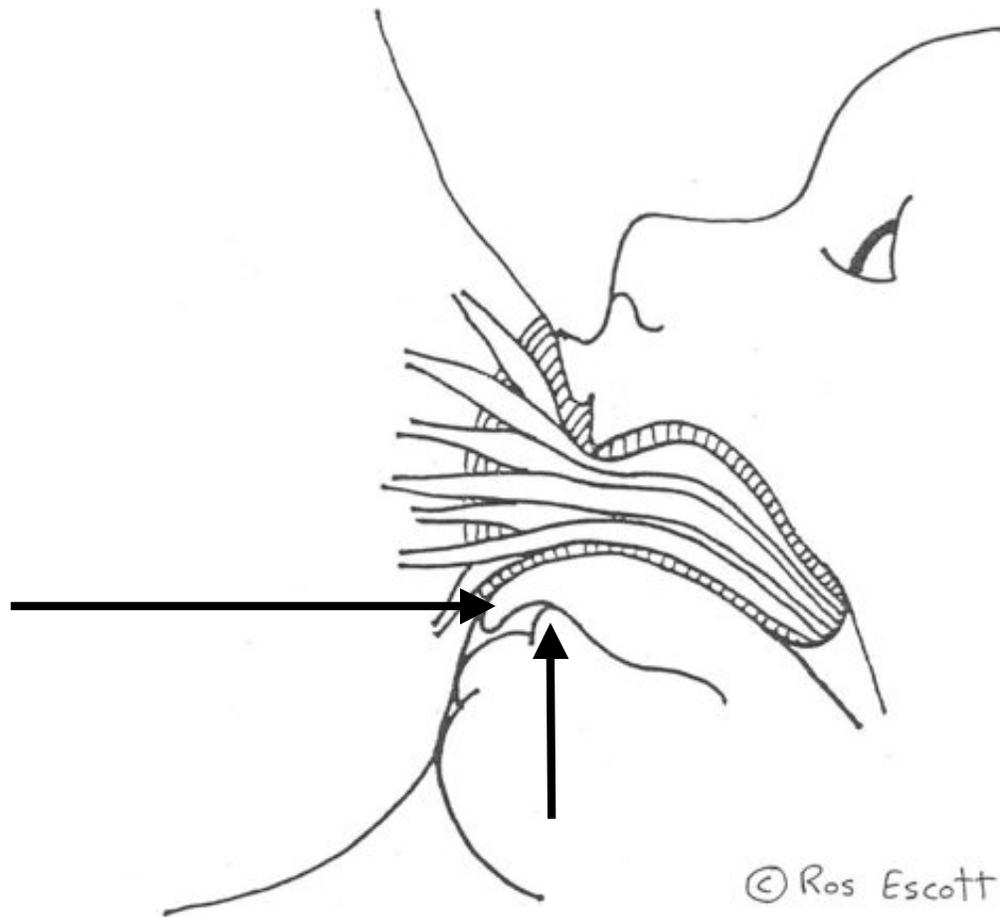


Illustration from Ros Escott article, Positioning, Attachment and Milk Transfer, Breastfeeding Review, 1989.

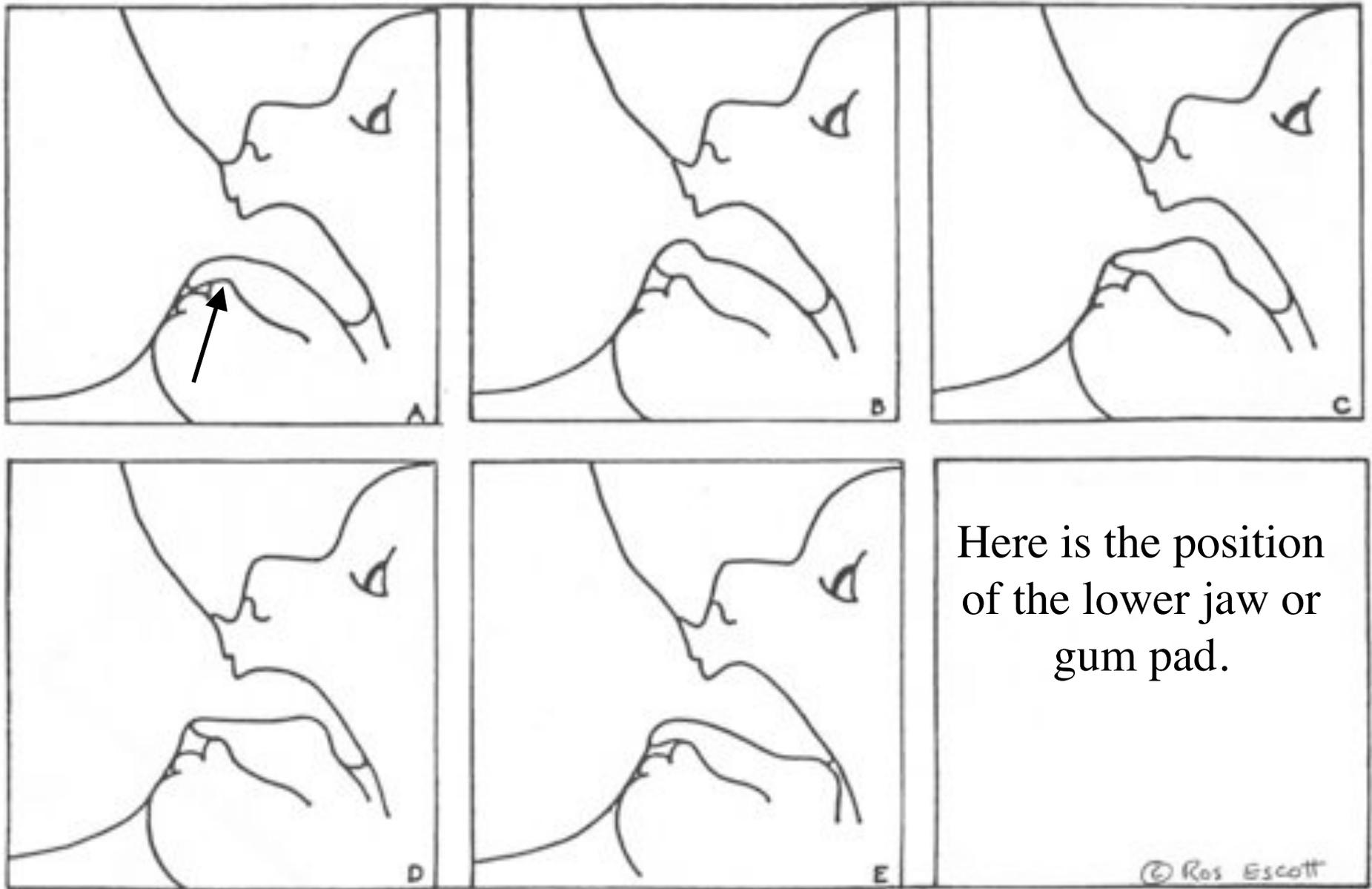


Illustration from Ros Escott article, Positioning, Attachment and Milk Transfer, (1989) Breastfeeding Review, 1989, p.35.

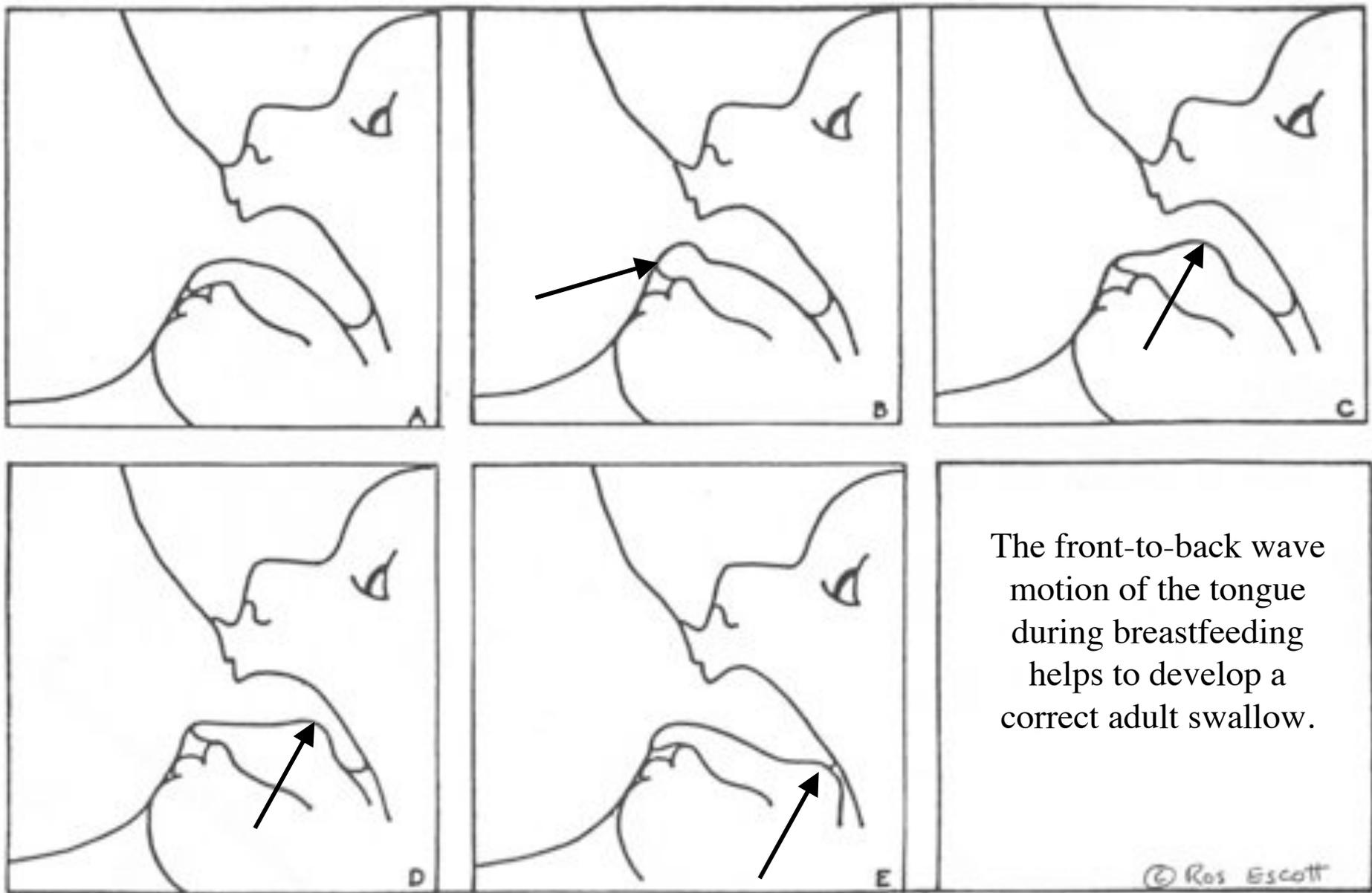
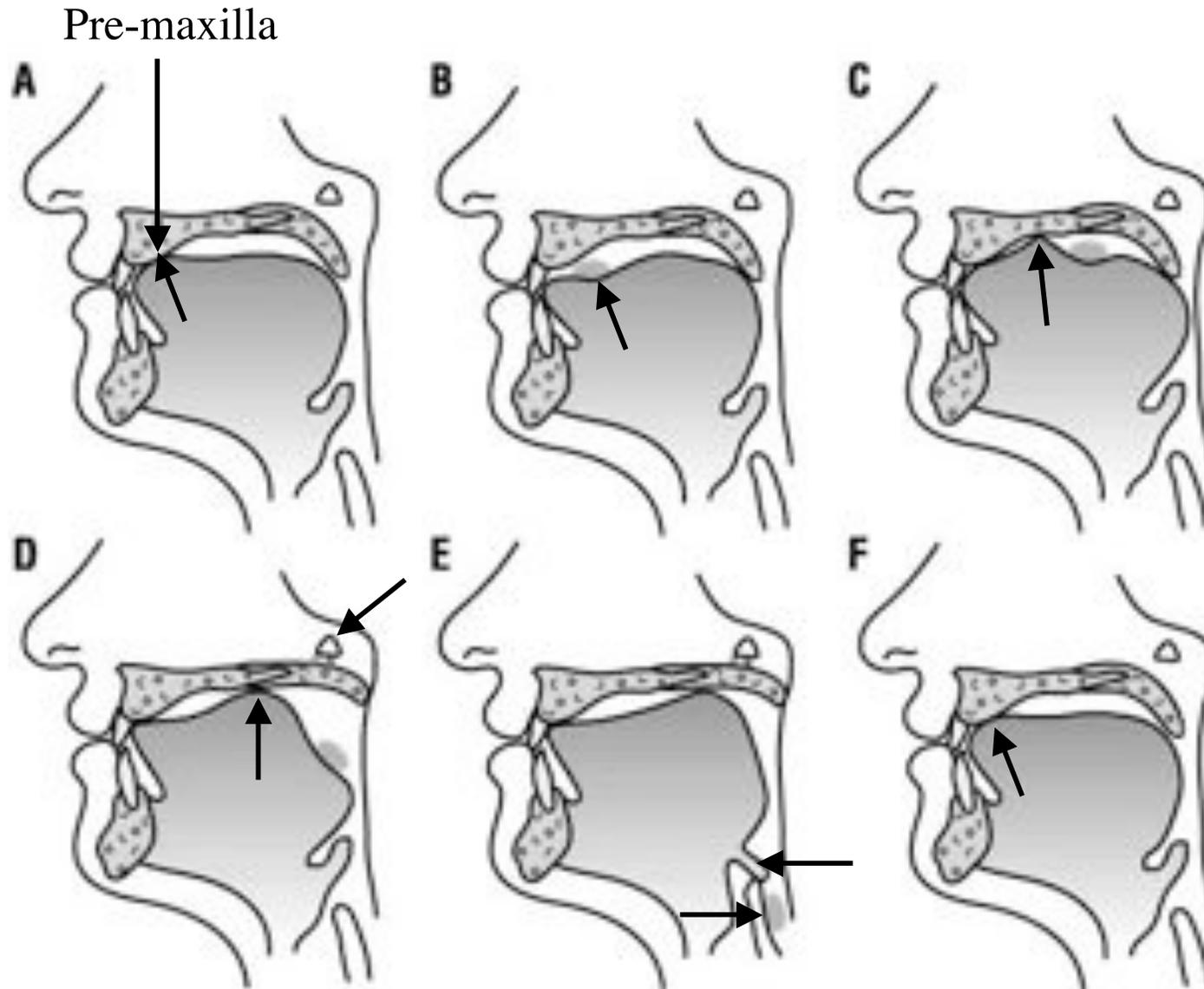


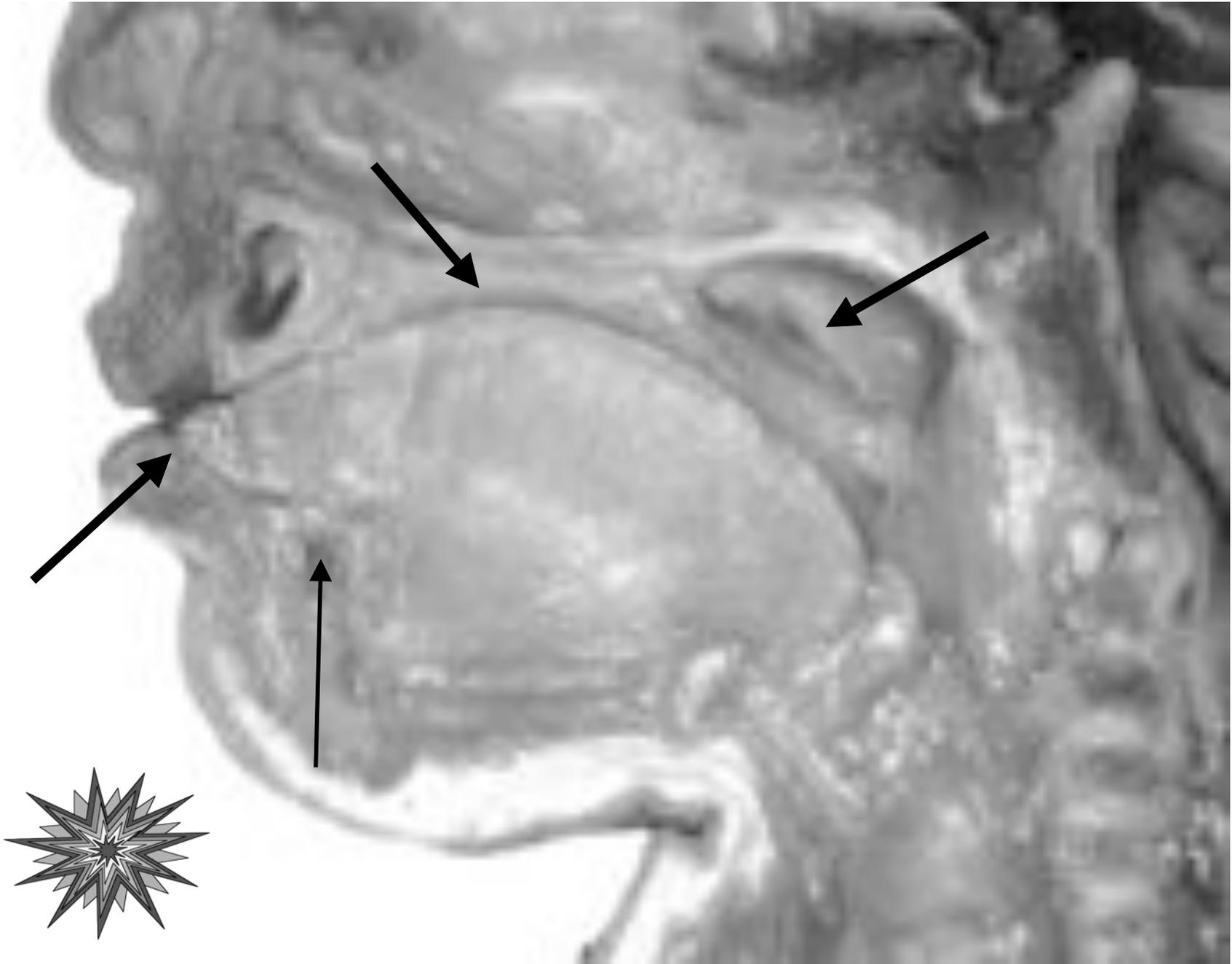
Illustration from Ros Escott article, Positioning, Attachment and Milk Transfer, Breastfeeding Review, 1989, p.35.

Adult Swallow

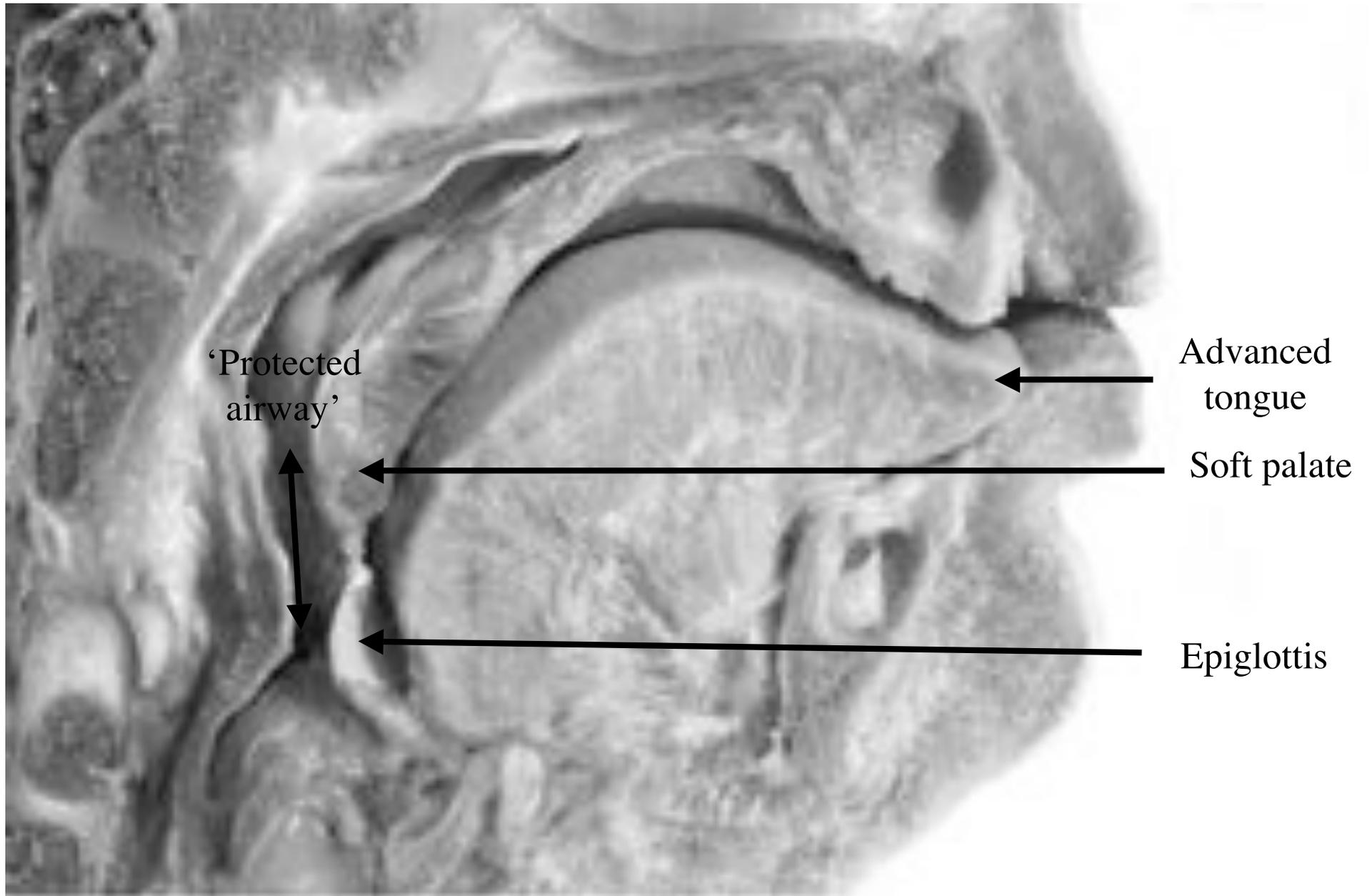


Warning!

Getting into showing dissection illustrations!



The advanced position of the tongue at birth.



Cadaver dissection showing close relationship between the epiglottis and soft palate.

Descent of the epiglottis - 1977

“Maturation descent of the epiglottis was found to occur between the 4th and 6th months of age.”

“This period interestingly coincides with the peak incidence of SIDS which occurs between the 3rd to 5th months of age.”

This is a key point in understanding the anatomy of the SIDS issue!

Sasaki CT, Crelin E,S et al. Postnatal Descent of the Epiglottis in Man, March 1977, Arch Otolaryngol, Vol. 103, 169-171.

Key Points

As the epiglottis descends, the tongue falls back into the mouth to its normal adult position.

The descent only occurs in humans!

The descent allows humans to speak!

However, it makes the acts of breathing, eating and drinking more complex!



The significance of the descent
of the epiglottis to the adult
position.

← Soft palate

← Epiglottis



The significance of the descent of the epiglottis to the adult position.

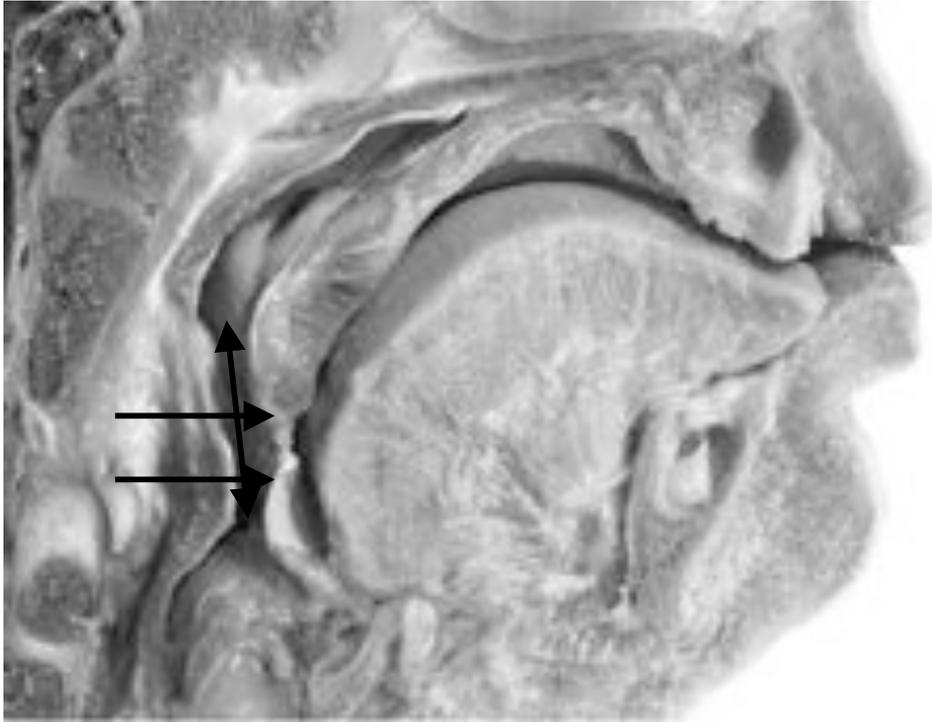
Soft palate

Tongue can now obstruct airway.

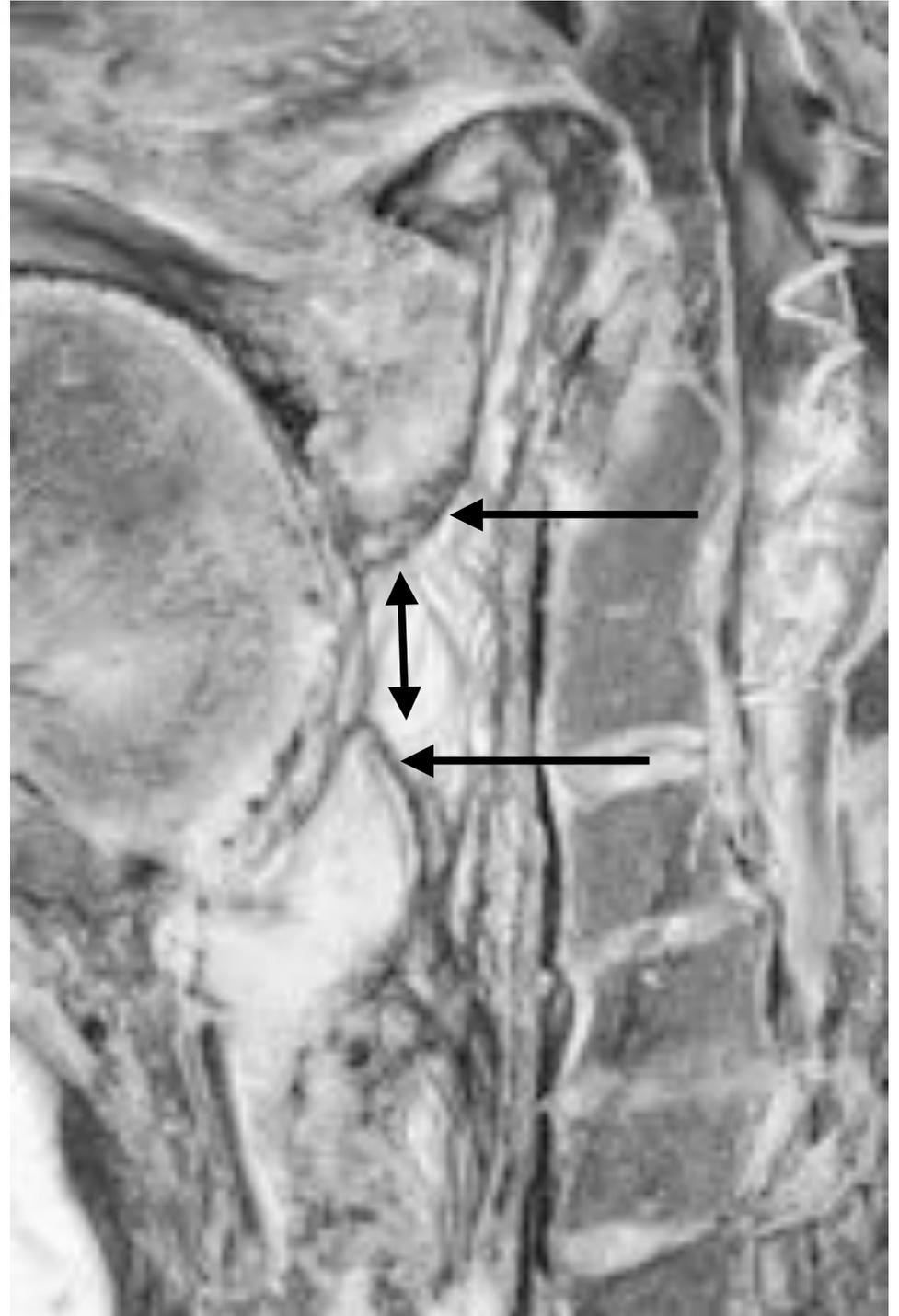
Epiglottis

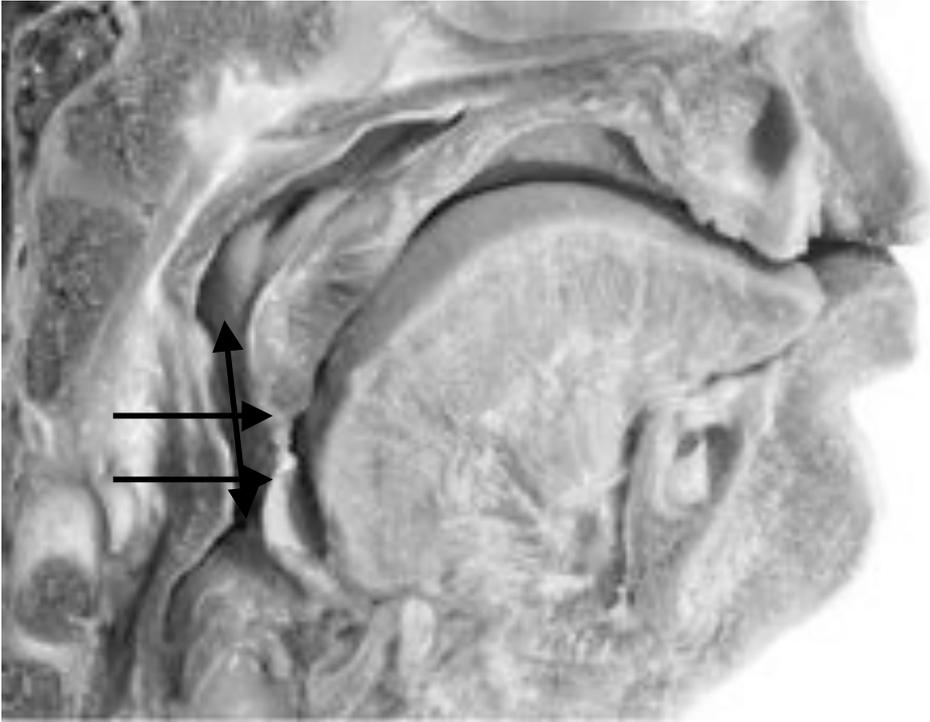
Note that the tongue is attached to the mandible.

The position of the jaw and tongue can determine airway space.

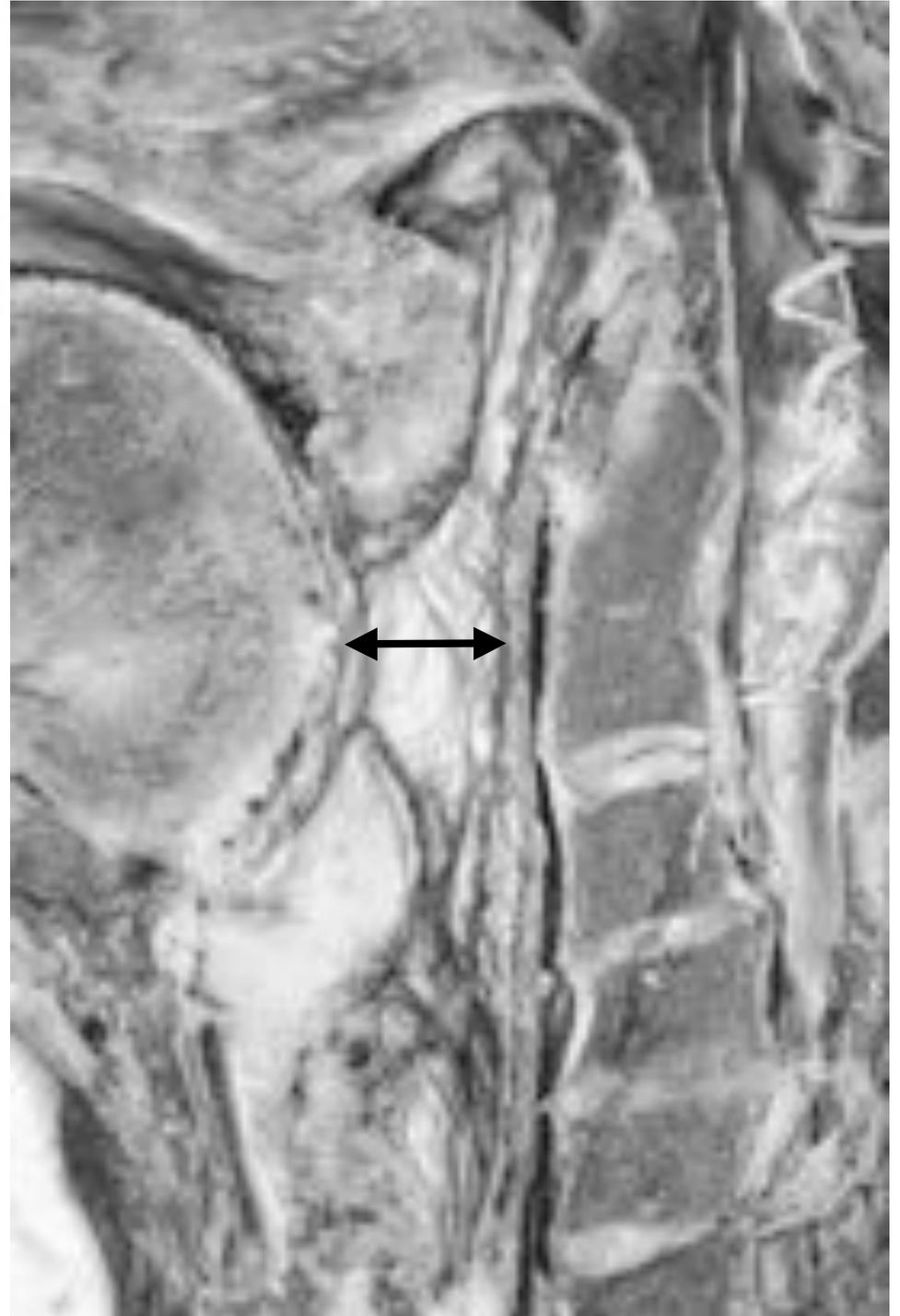


KEY COMPARISON
between the oropharynx of a
newborn and an adult.





Once the epiglottis descends, the airway is less protected from obstruction





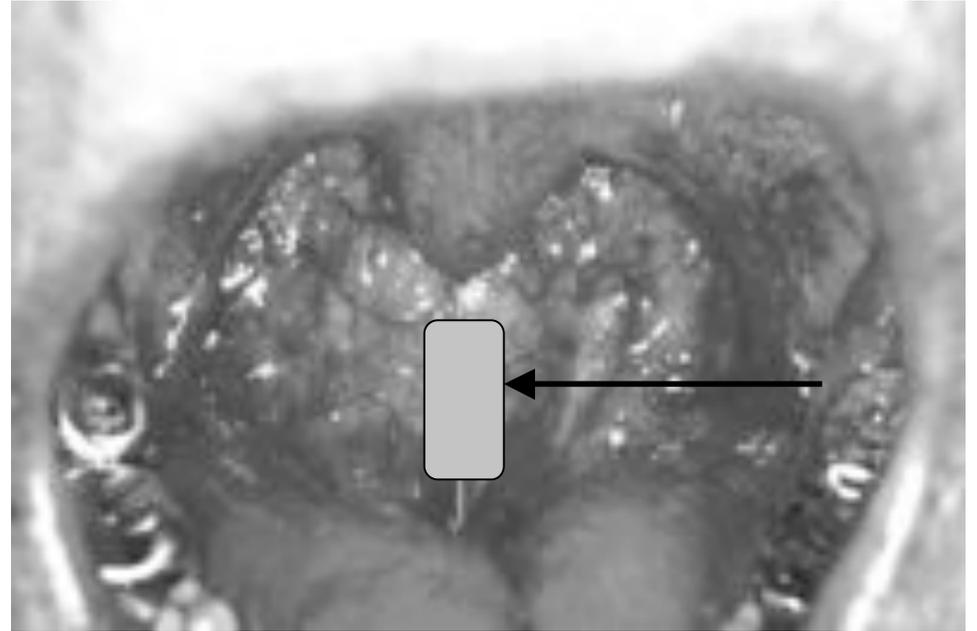
The significance of the
epiglottis - soft palate
relationship to
breastfeeding!

(Edmund S. Crelin. The Human Vocal Tract, 1987. Vantage Press ISBN:0-533-06967-X)



Channels around overlap
where breastmilk flows.

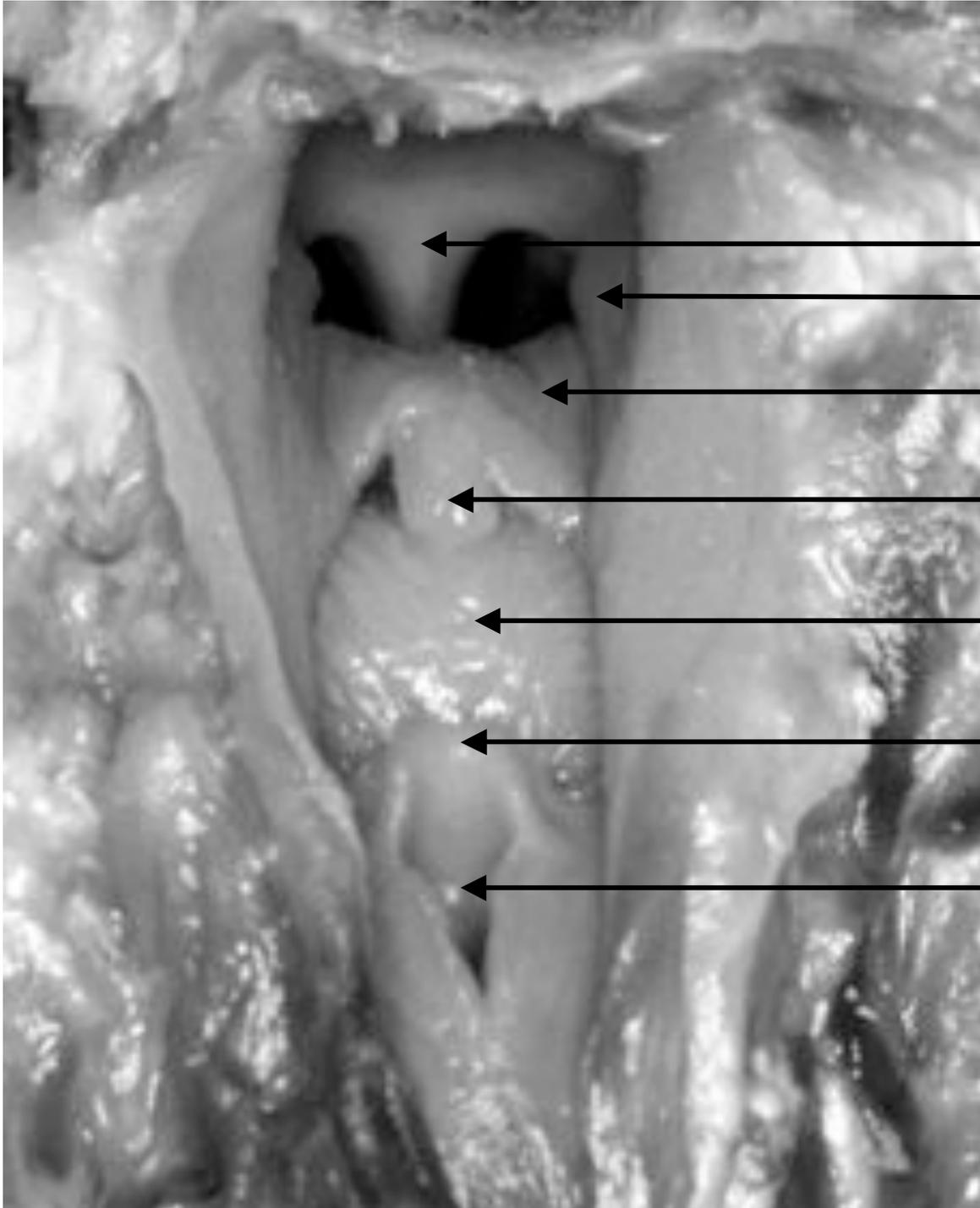
(Edmund S. Crelin. The Human Vocal Tract, 1987. Vantage Press ISBN:0-533-06967-X)



Adult throat

Pretend you are lying at the back of your throat and looking forward.

(Edmund S. Crelin. The Human Vocal Tract, 1987. Vantage Press ISBN:0-533-06967-X)



A view from the back of
your throat looking forward.

Nasal septum

Eustachian tube

Soft palate

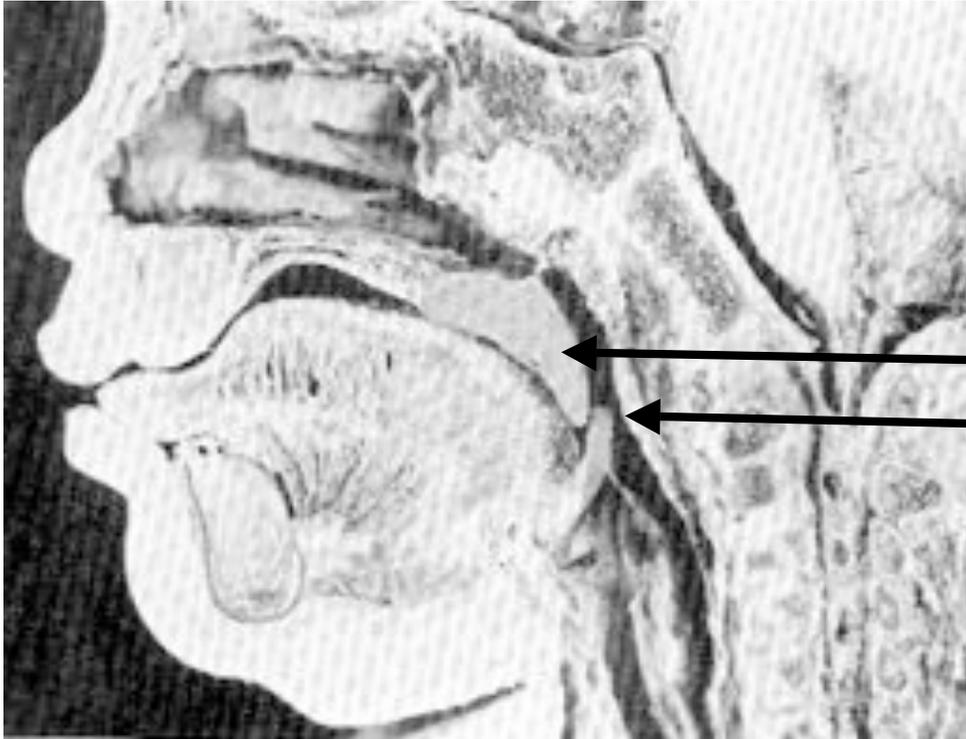
Uvula

Tongue

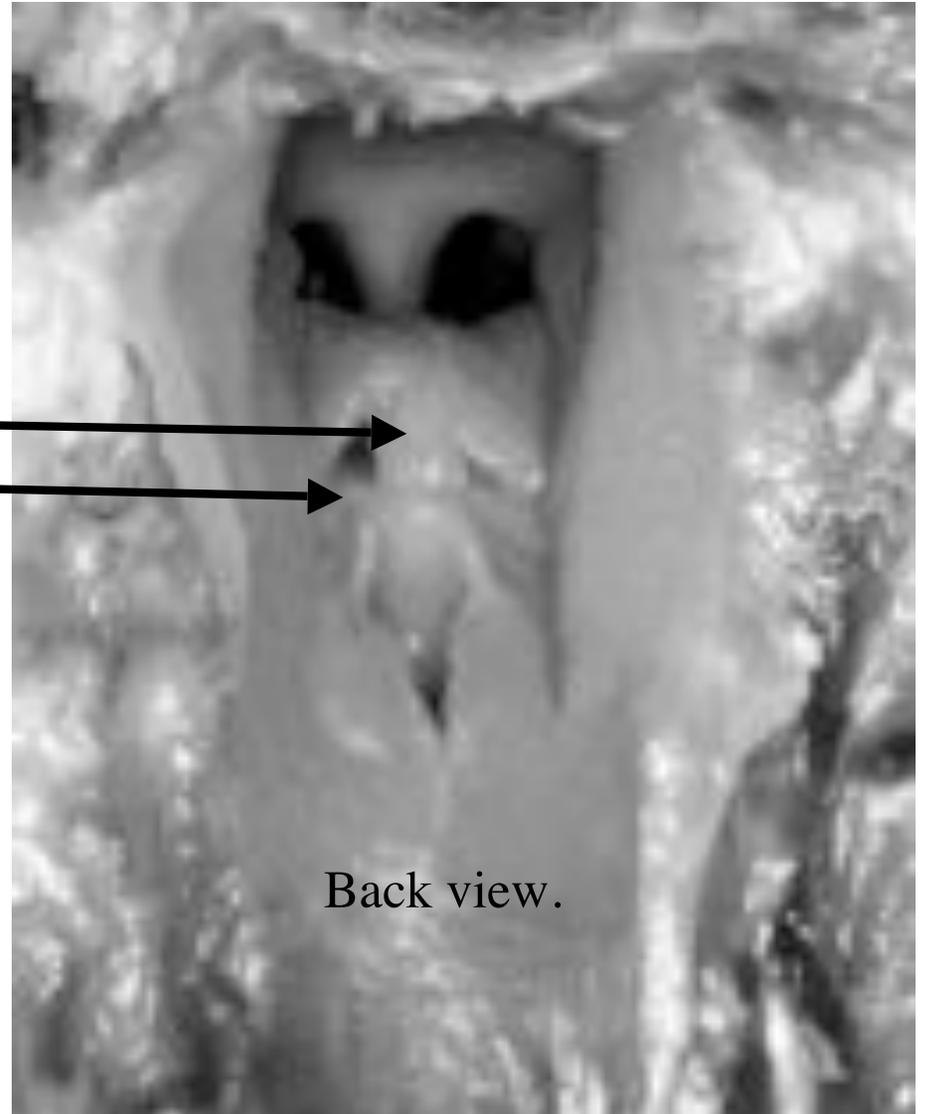
Epiglottis

Inlet to larynx/lungs

The 'overlap' from 2 perspectives.



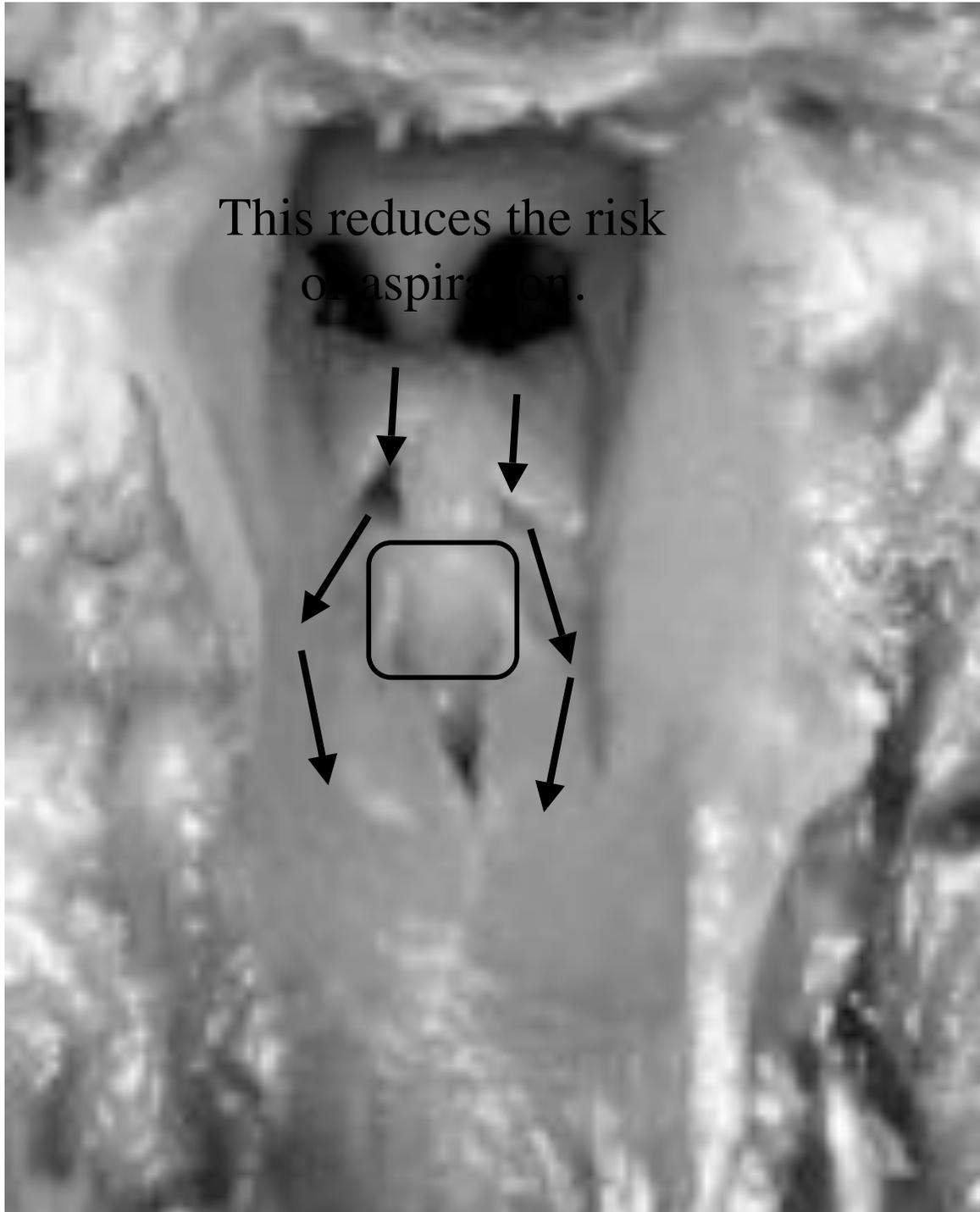
Side view.



Back view.

(Edmund S. Crelin. The Human Vocal Tract,
1987. Vantage Press ISBN:0-533-06967-X)

Previous illustration altered as per
Crelin's explanation of what happens
during breastfeeding.



Overlapping of soft palate and epiglottis while newborn is breastfeeding.

Note channels on both sides of the interlock.

Note how breastmilk passes through the channels and around the epiglottis.

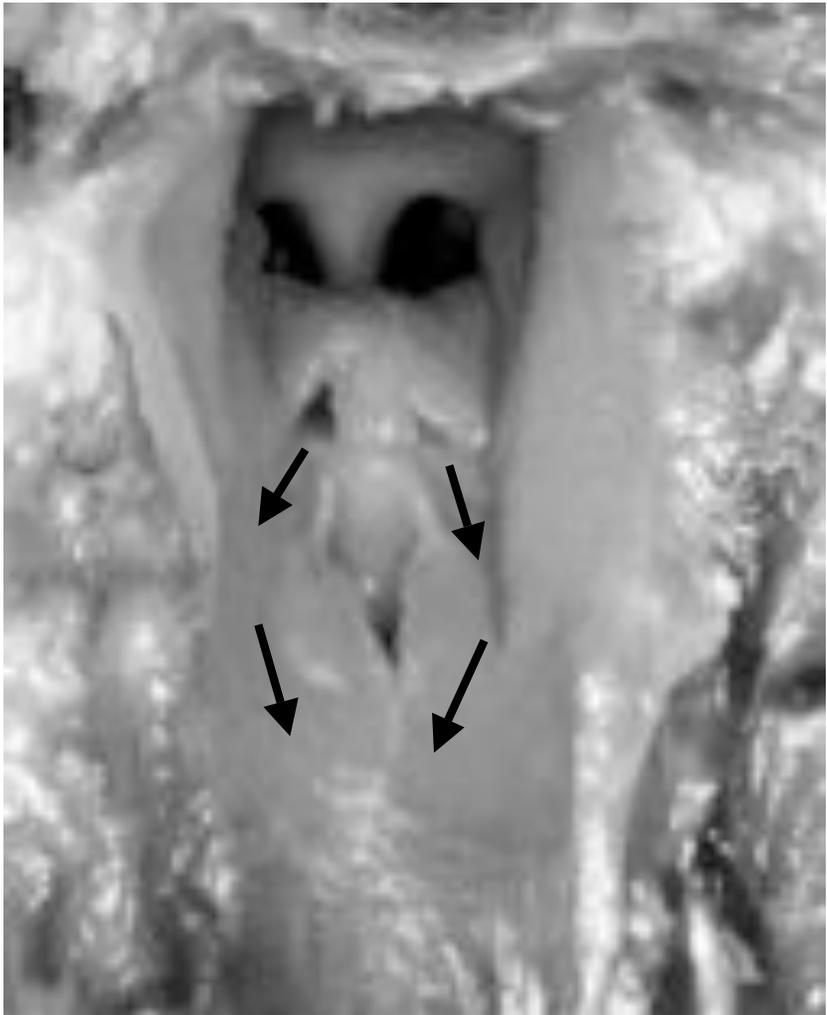
Note “Protected” inlet down to the lungs.

Illustration altered as per Crelin’s explanation of what happens during breastfeeding.



Note how water flows around structure in middle of the river.

Comparison as to how fluids can flow around the base of an object, leaving top protected from the fluid.

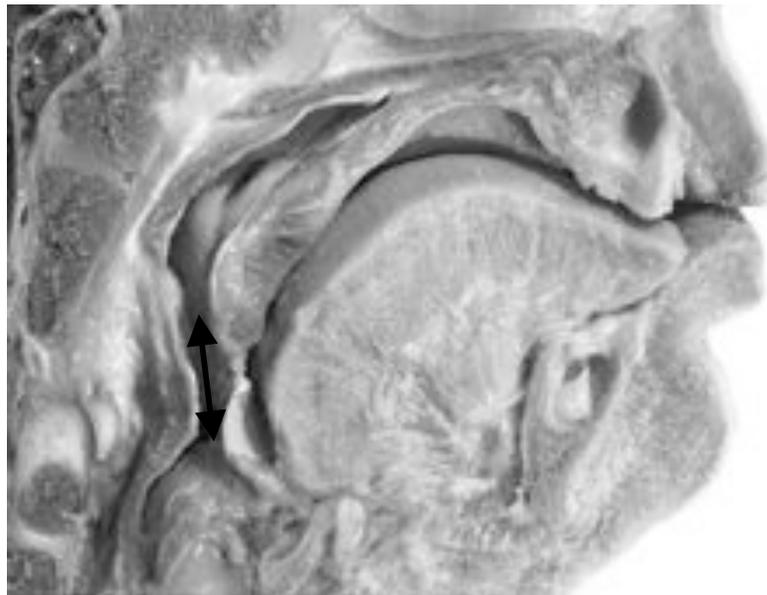


My hypothesis only!

SIDS rarely occurs during the 1st month.

WHY?

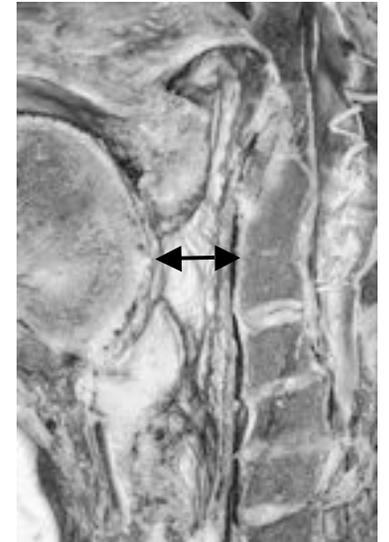
The strong protective proximity
between the epiglottis-soft palate.



Peak incidence of SIDS occurs between the 3rd to 5th months.

Why?

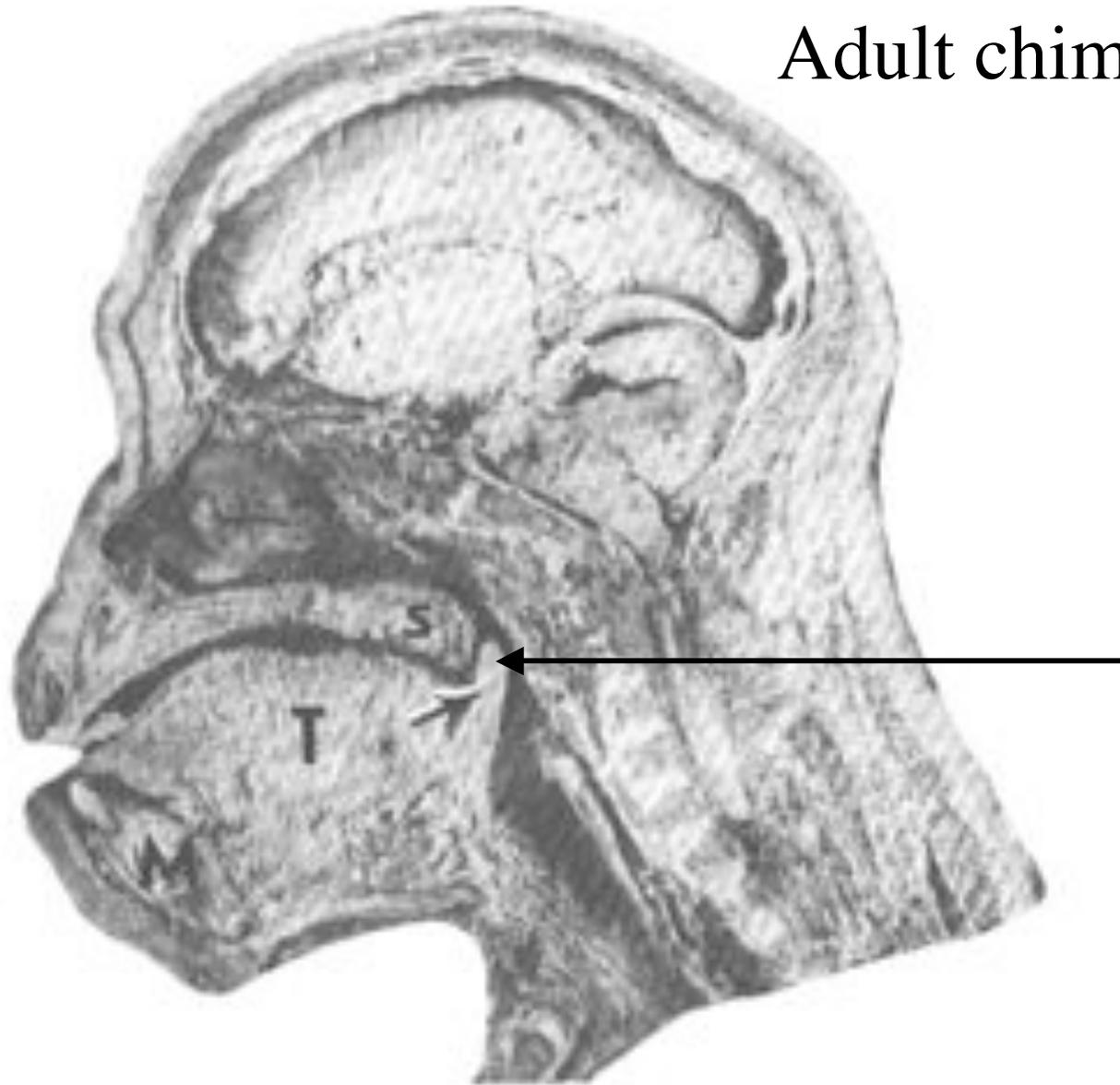
This is the period when the epiglottis is descending to the adult position.



The base of the tongue becomes the front wall of the oropharynx (throat).

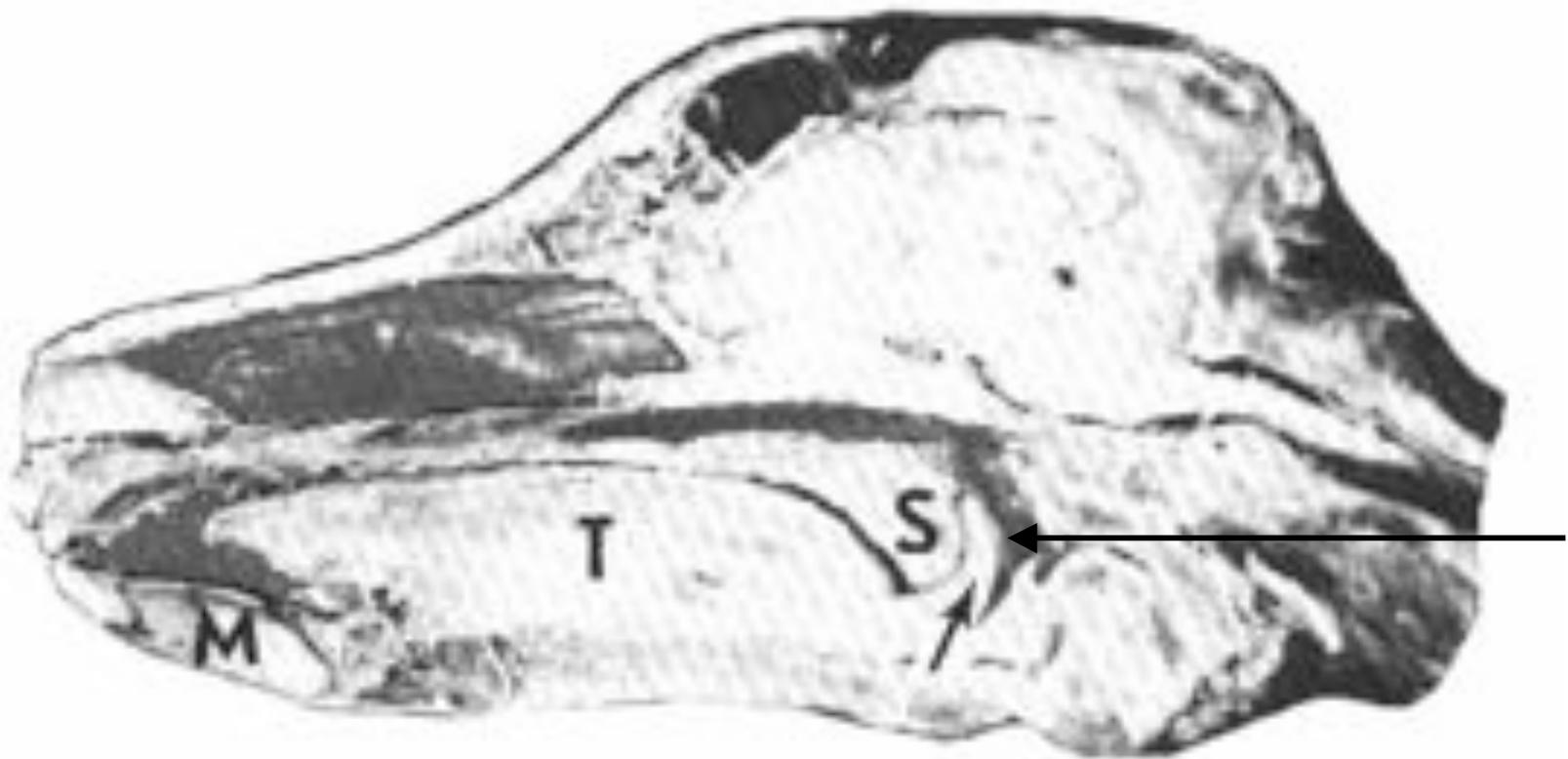
Key: Is the brainstem mature enough to respond if the airway becomes obstructed?

Adult chimpanzee



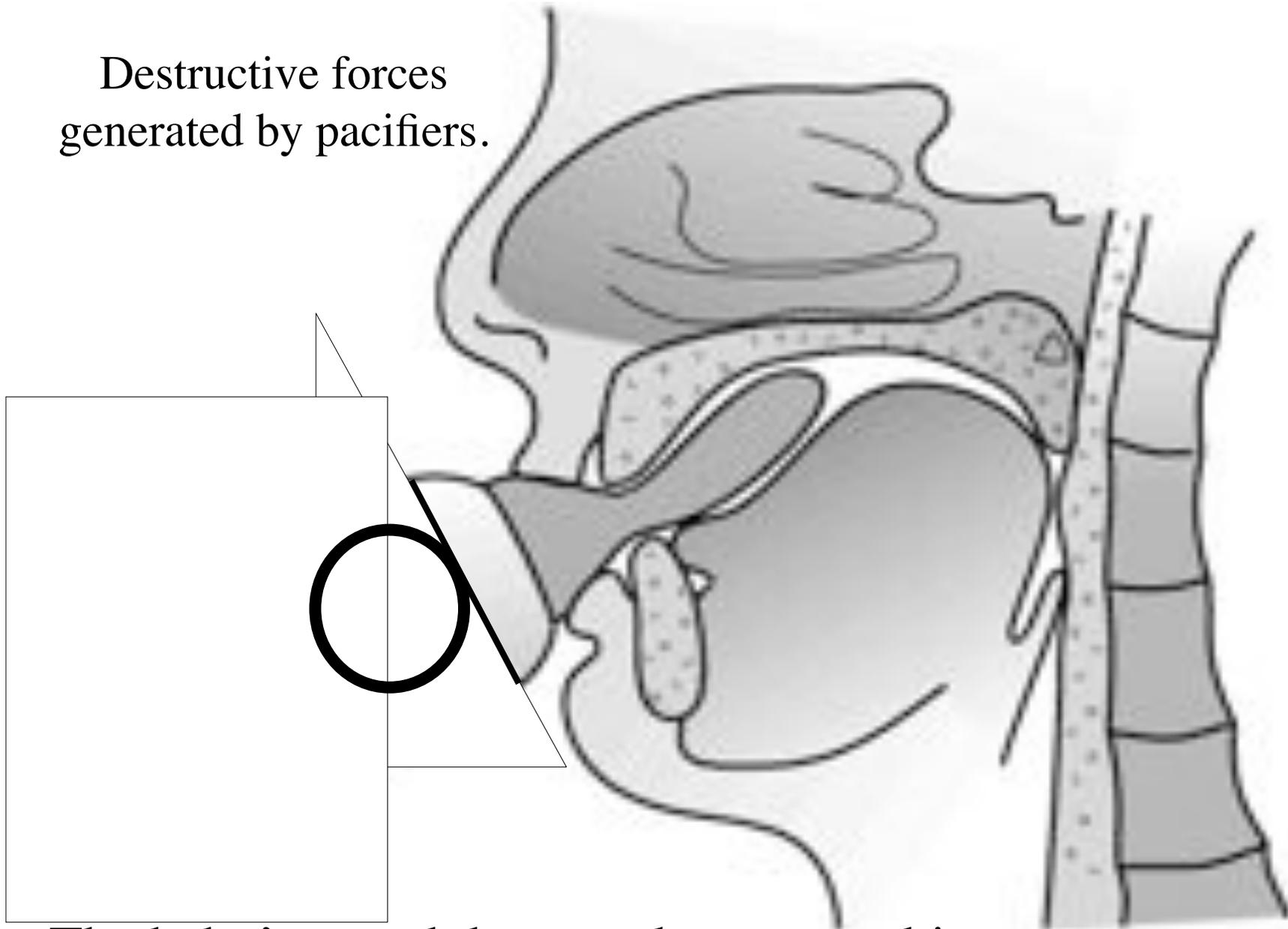
(Edmund S. Crelin. The Human Vocal Tract, 1987. Vantage Press ISBN:0-533-06967-X)

Adult dog.



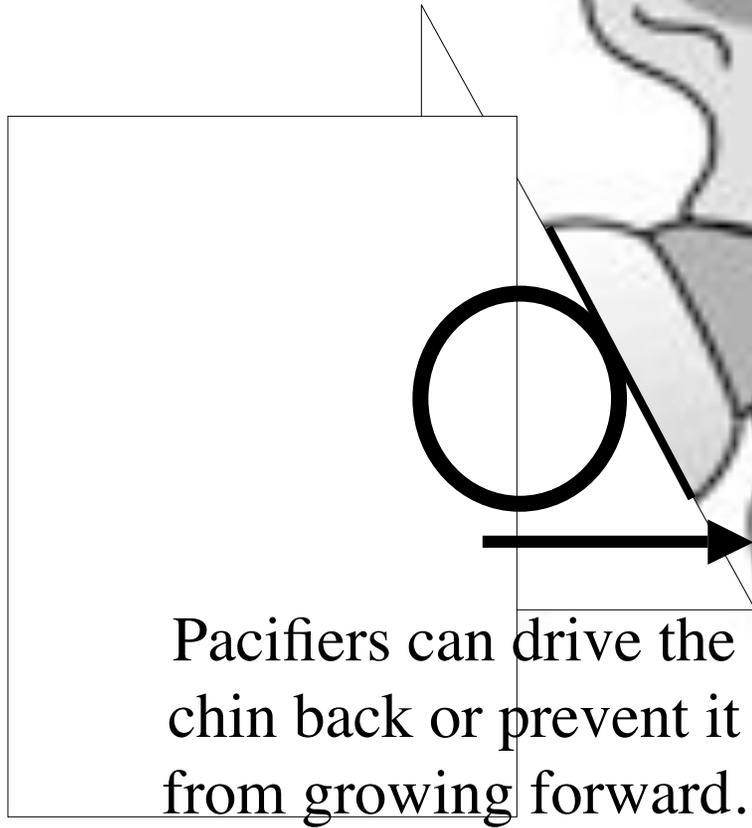
(Edmund S. Crelin. The Human Vocal Tract, 1987. Vantage Press ISBN:0-533-06967-X)

Destructive forces
generated by pacifiers.

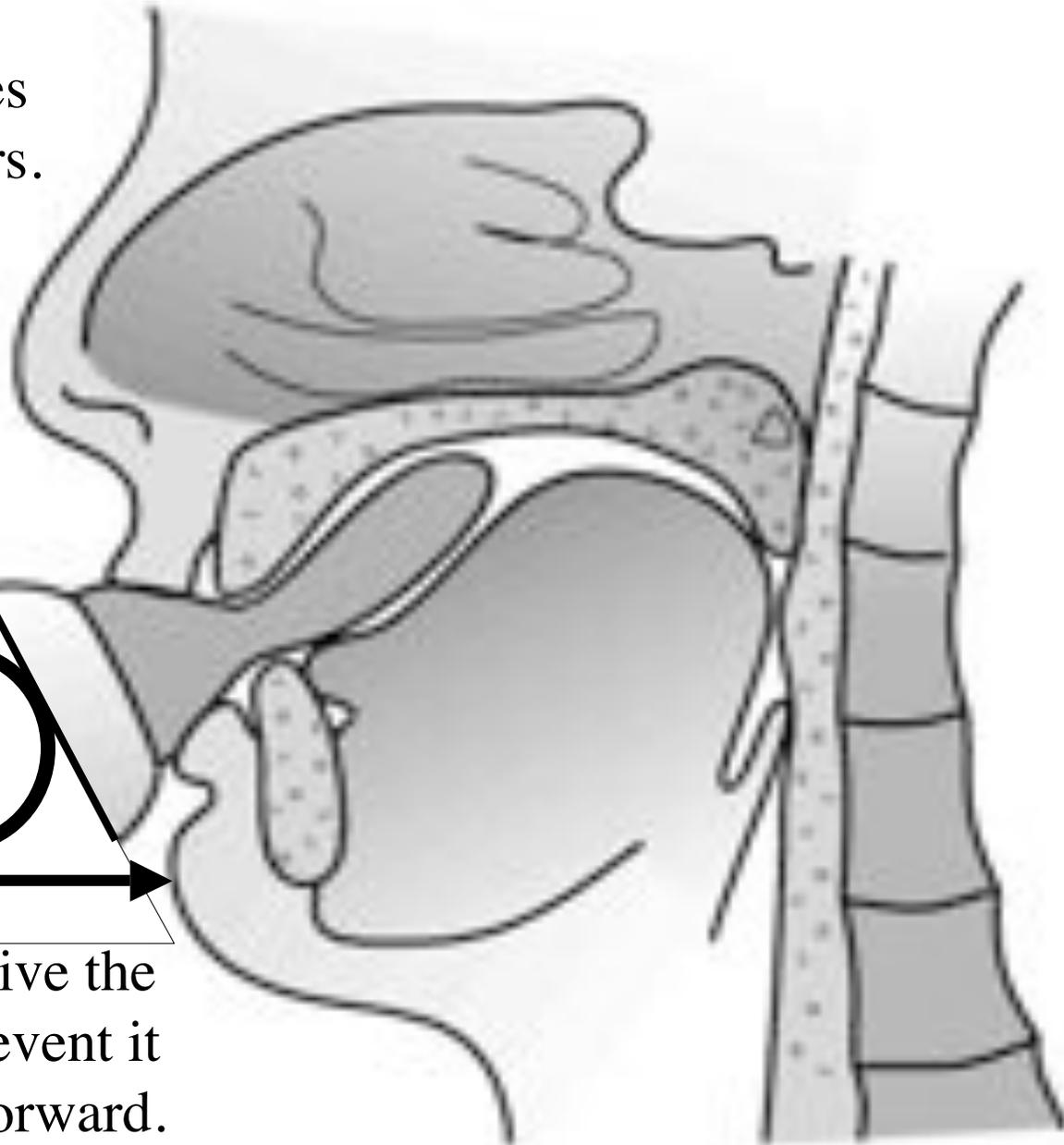


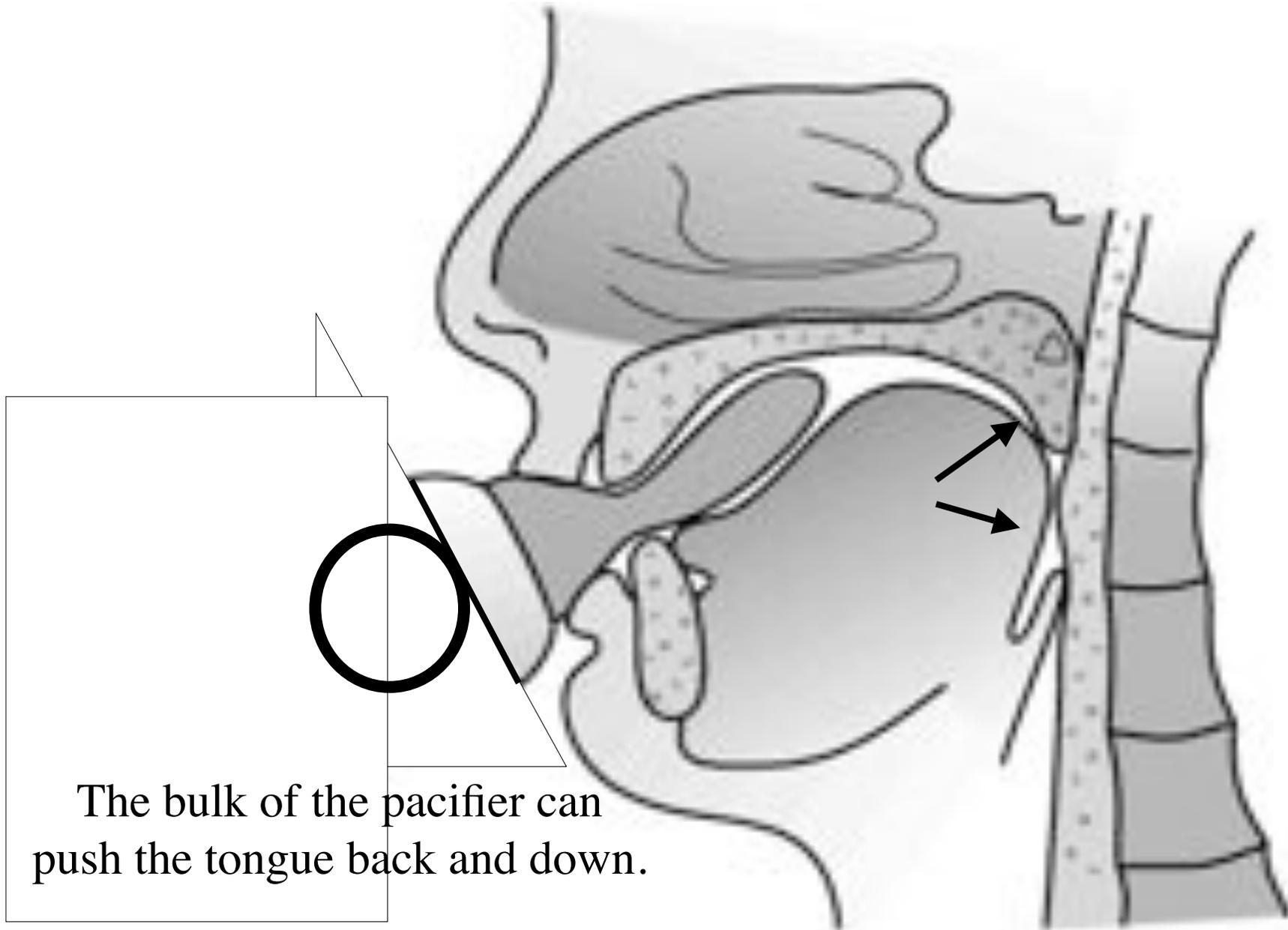
The baby's mouth has to adapt to anything put
in the mouth firmer than the mother's breast.

Destructive forces
generated pacifiers.

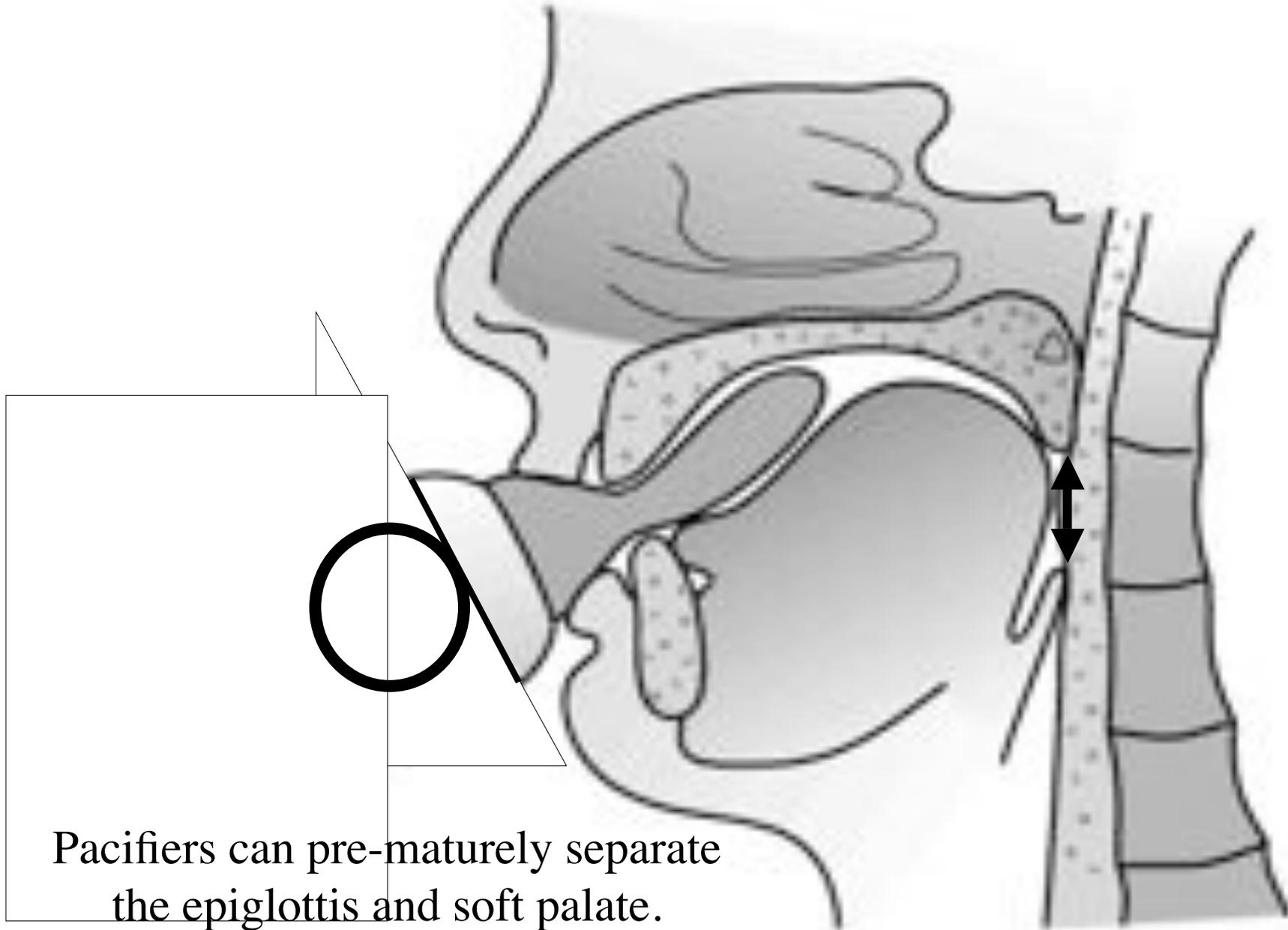


Pacifiers can drive the
chin back or prevent it
from growing forward.

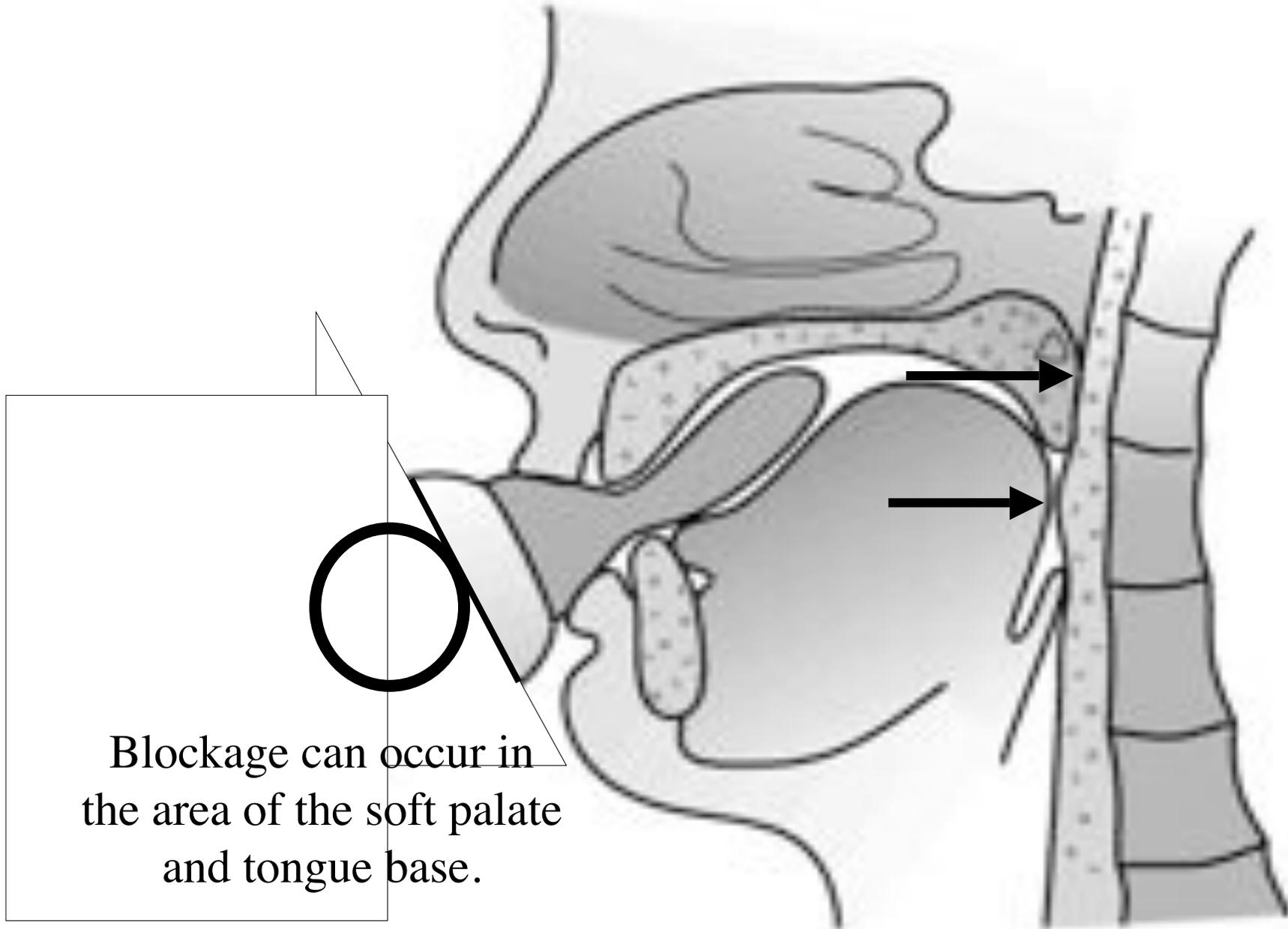




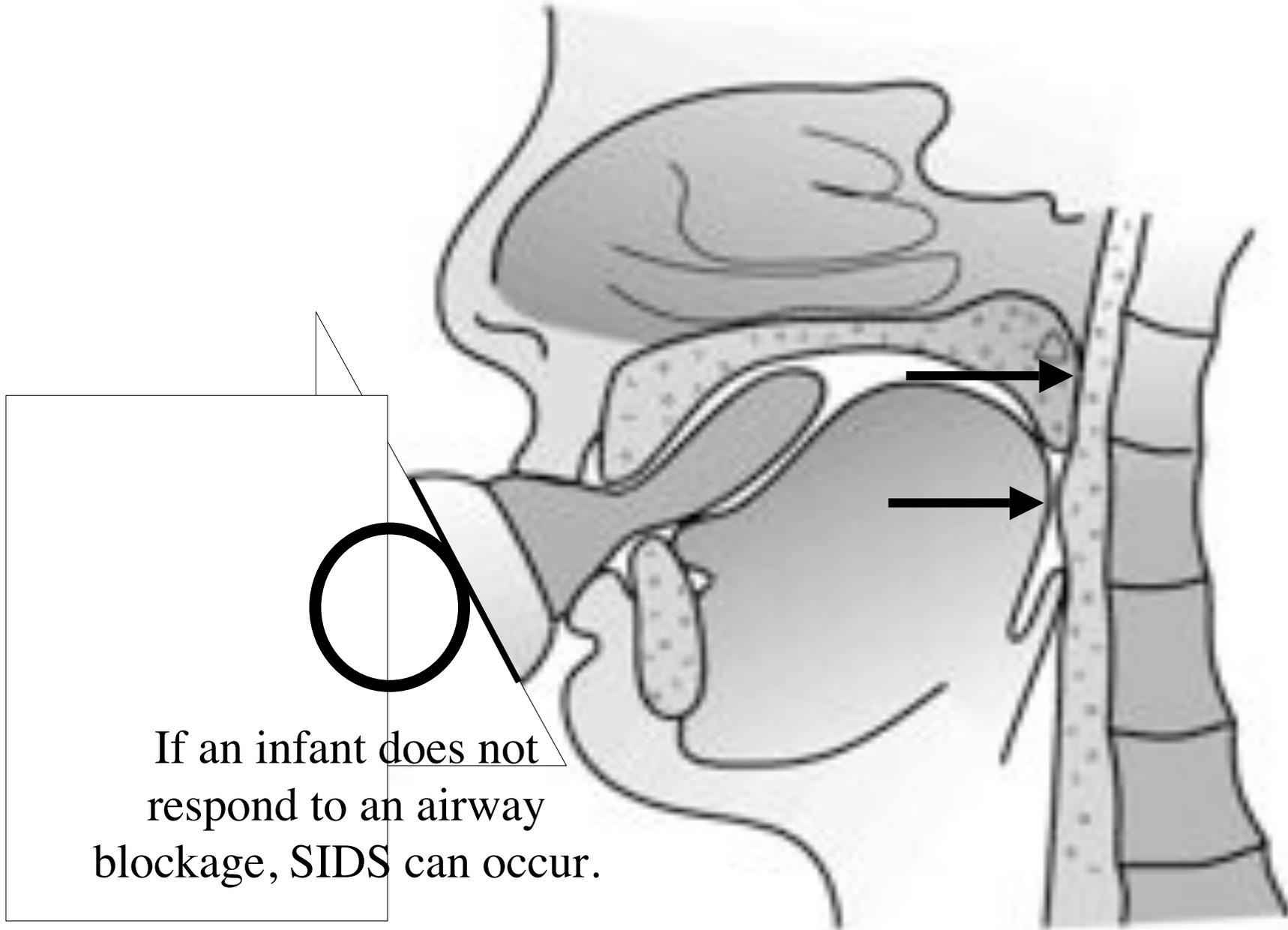
The bulk of the pacifier can push the tongue back and down.



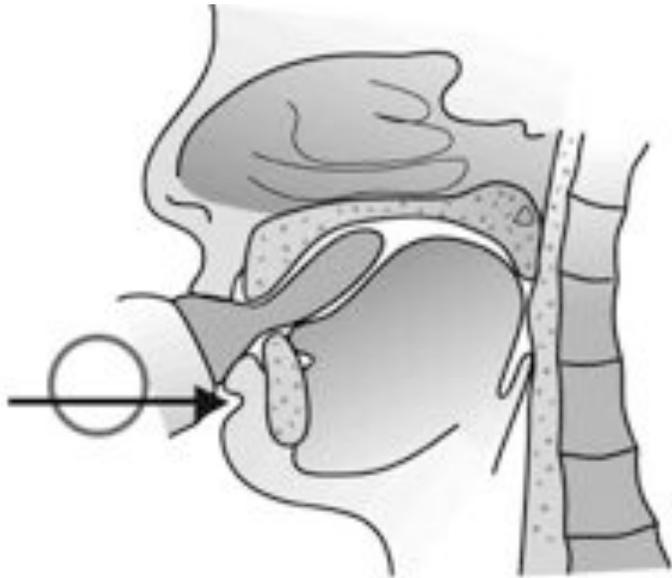
Pacifiers can pre-maturely separate the epiglottis and soft palate.



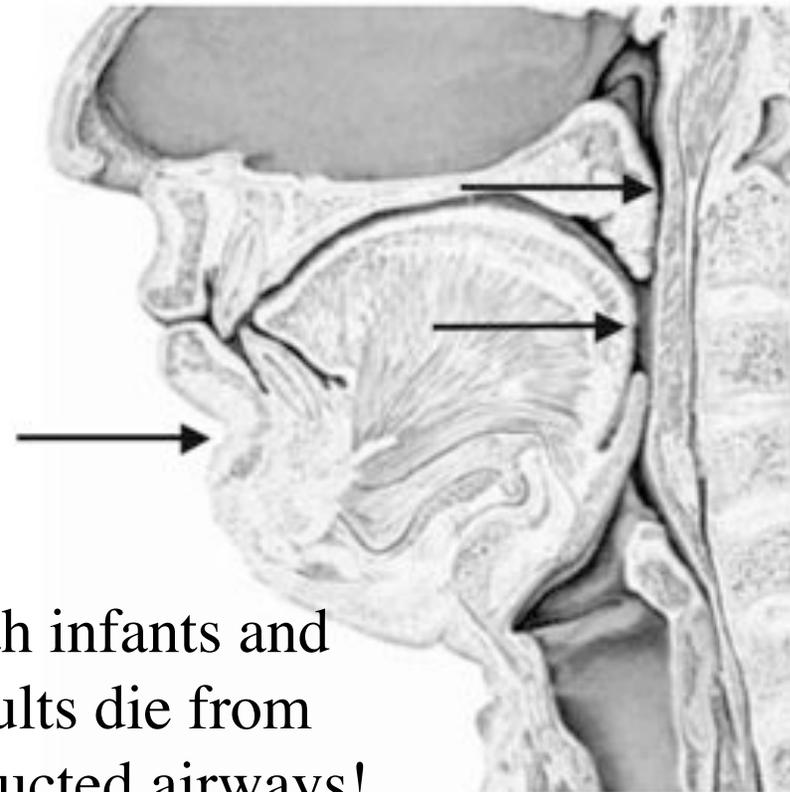
Blockage can occur in
the area of the soft palate
and tongue base.



If an infant does not respond to an airway blockage, SIDS can occur.

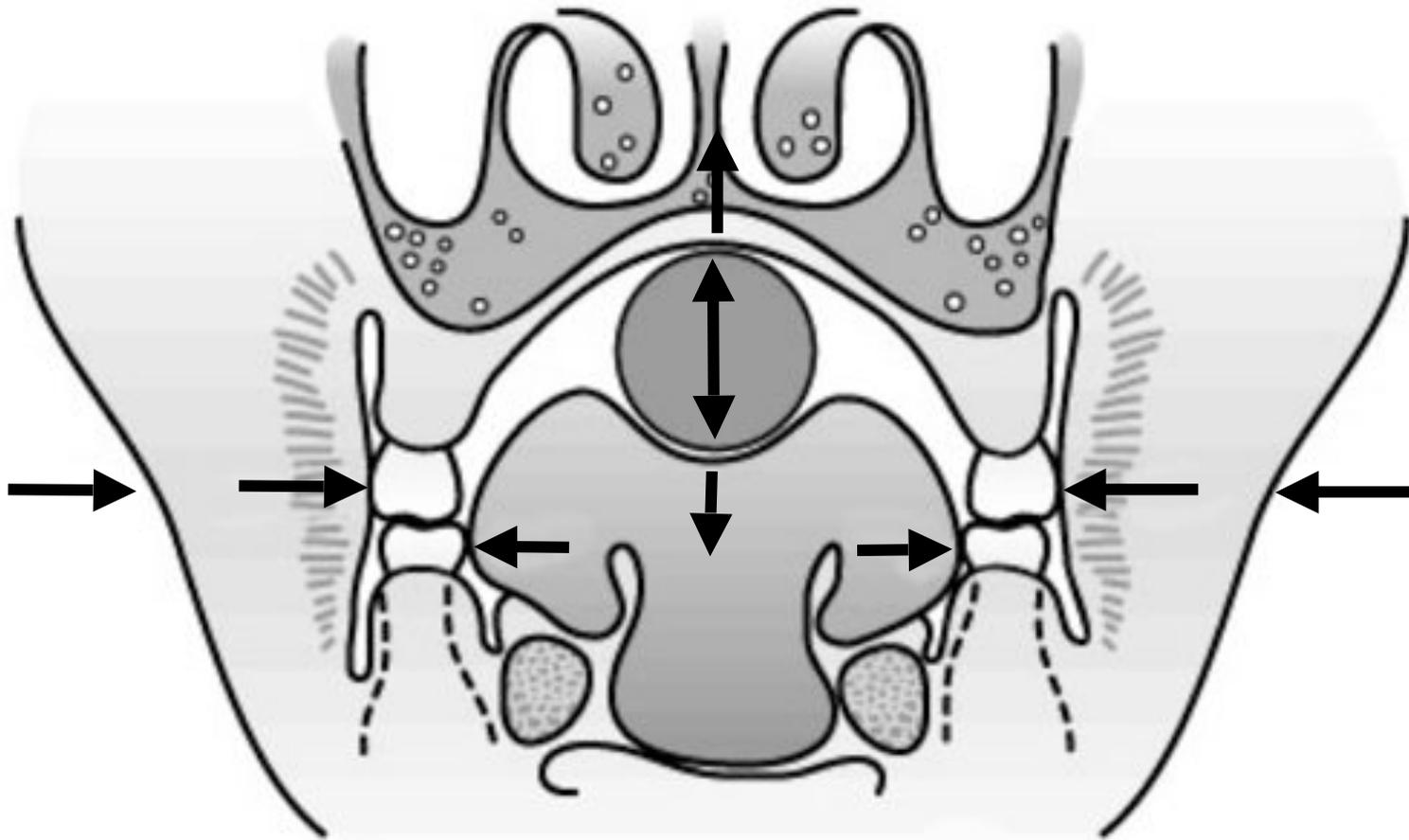


The relationship
between retruded
chins and airway
obstruction!



Both infants and
adults die from
obstructed airways!

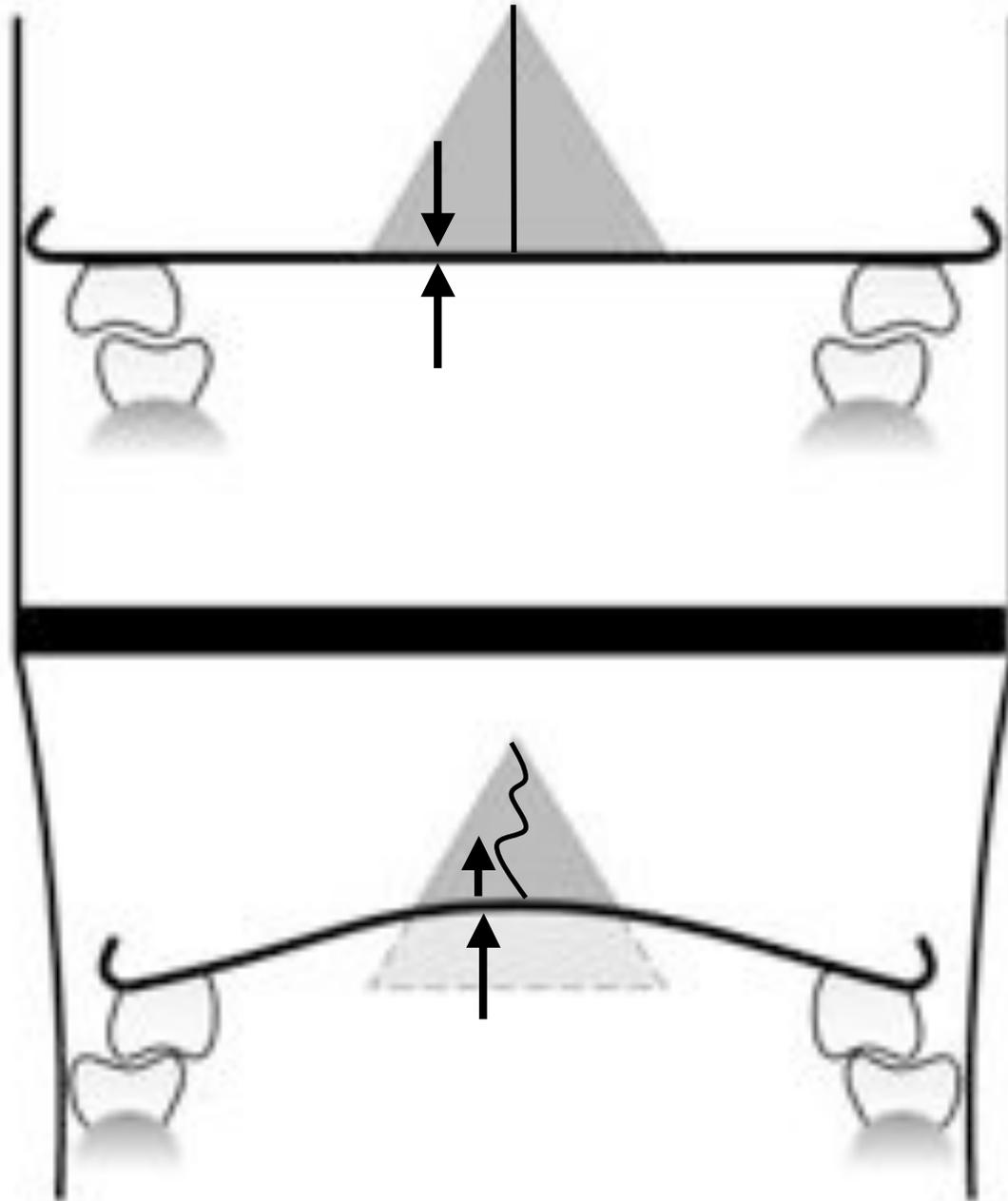
Again, the baby's mouth has to adapt to anything put in the mouth firmer than the mother's breast.



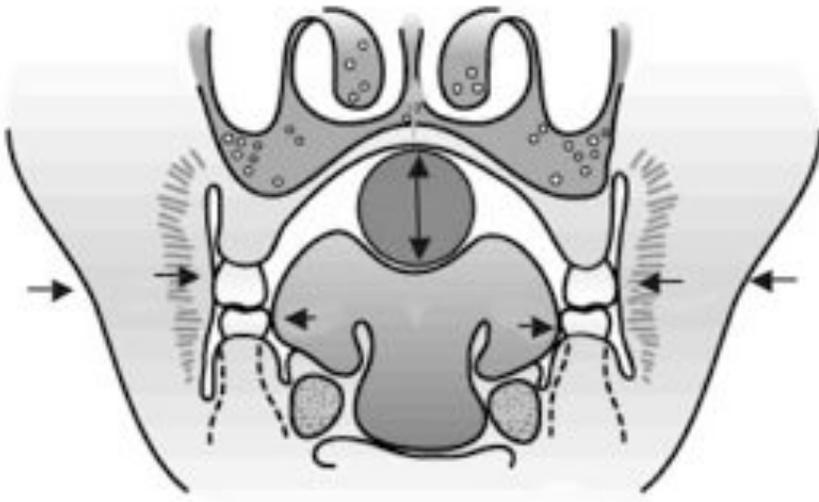
Amount of 'suck' on a pacifier can vary.

Palate height and nasal space.

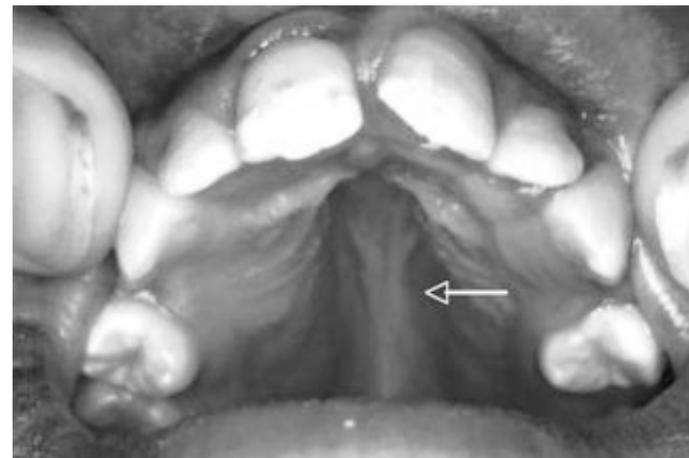
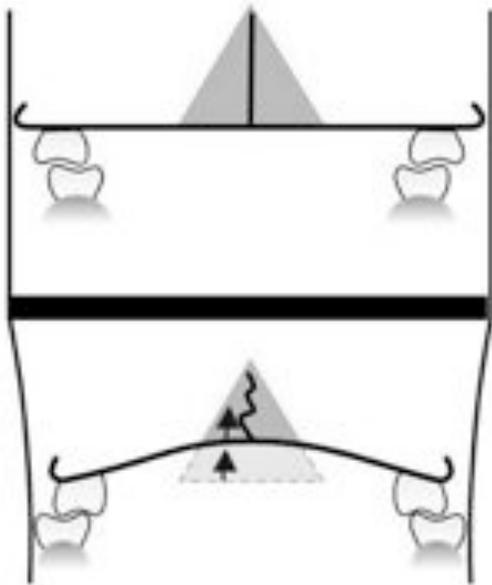
The bone for the roof of the mouth is also the same bone as the floor of the nose.



Elevating the palate decreases nasal space and can increase airflow resistance.



Sucking on pacifiers contributes to high palates and narrow dental arches.





Prehistoric



1940s

“THE ISSUE”

Principles or assumptions on which
the AAP Policy Statement is based.

*The Changing Concept of Sudden Infant Death Syndrome: Diagnostic Coding Shifts, Controversies
Regarding the Sleeping Environment, and New Variable to Consider in Reducing Risk.*

Pediatrics Nov 2005;116(5):1245-55.

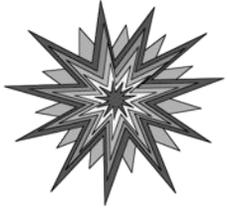
Major reasoning for recommending placing a pacifier in an infant's mouth when put down to sleep is based on McGarvey's research:

“analysis of the data suggesting that usual use of a soother significantly increased the risk of SIDS while use of a soother in the last sleep period emerged as a protective factor.

“Further examination of the data showed that while 77% of SIDS cases habitually used a soother, only 30% did so on the night of the last sleep. Analysis ... revealed that babies who regularly used a soother while sleeping were at a significantly higher risk of SIDS if this soother was missing during the last/reference sleep period.”

This means that only 23% of infants who died from SIDS were not pacifier users - and were probably breastfed!

McGarvey C et al. *Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland*. Arch Dis Child. 2003 Dec;88(12):1058-64.



Assumption #1

The pacifier pulls the tongue forward.

Following is the sequence of references on which the position that pacifiers pull the tongue forward is based.
(1973-1998)

Sequence of references (1973-1998)

L'Hoir, (L'Hoir MP, Engelberts AC et al. *Risk and preventive factors for cot death in the Netherlands, a low-incidence country*. Eur J Pediatr. 1998 Aug;157(8):681-8.) **in 1998**, refers to Mitchell's article from 1993 as being the authority.

Mitchell, (Mitchell EA, Taylor BJ, et al. *Dummies and the sudden infant death syndrome*. Arch Dis Child. 1993 Apr;68(4):501-4.) **in 1993** refers to Cozzi's article in 1979 as being the authority.

Cozzi (Cozzi F, Albani R, Cardi E. A common pathophysiology for sudden cot death and sleep apnoea. "The vacuum-glossoptosis syndrome". Med Hyptheses. 1979 Mar;5(3):329-38 **in 1979** refers to Swift's article from 1973 as being the authority.

Swift, (Swift PG, Emery JL. *Clinical observations on response to nasal occlusion in infancy*. Arch Dis Child. 1973 Dec;48(12):947-51.) **in 1973**, was the originator of the statement that pacifiers pull the tongue forward.

How the information changed:

Swift, in 1973, stated: “presumably the dummy pushes the tongue down from the soft palate breaking the velo-lingual sphincter.”

Cozzi, in 1979, stated: “the use of a pacifier or other oral devices with a large, rigid guard designed to avoid falling out of the mouth during sleep, could probably prevent the seal of the glosso-palatal valve, thus breaking the death cycle above described.”

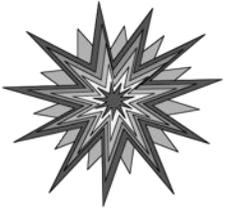
Mitchell, in 1993, stated: “Cozzi et al suggested that in SIDS a vacuum might occur in the pharynx, pulling the tongue back and blocking the airway. They suggested that a dummy might prevent the tongue sealing off the airway. To our knowledge, however, this hypothesis has not been tested.”

L’Hoir, in 1998, stated that dummy use might “might keep the tongue forward and maintain upper airway patency.”

The AAP principle that pacifiers pull the tongue forward is based on:

- From Swift's "presumably the dummy pushes the tongue down"
- To Cozzi's "could probably prevent the seal"
- To Mitchell's "a dummy might prevent"
- To L'Hoir's "might keep the tongue forward"

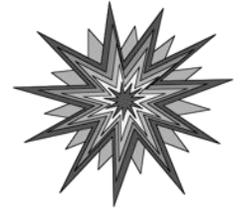
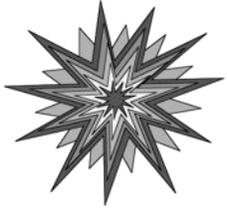
Is this the science-based research that a major healthcare policy is built around?



Cristiane F. Gomes et al. Surface electromyography of facial muscles during natural and artificial feeding of infants. J Pediatr (Rio J) 2006 March-Apr;82(2):103-9.

Conclusion: “Bottle-feeding reduces masseter activity, increases buccinator activity, reduces jaw movement, and **causes the tongue to retract.**”

[Bottle teats and pacifiers are both artificial teats and have similar influences on tongue position.



First AAP assumption is that the pacifier pulls the tongue forward.

Assumption #1 is invalid!

Assumption #2

The pacifier opens the airway
while sleeping.

Comment by Kahn in 2002

“It was concluded that high ambient temperature could add to the difficulty to arouse from REM sleep in the late hours of the night, when most SIDS deaths occur.”

Kahn A, et al. *Sudden infant deaths: from epidemiology to physiology*.
Forensic Science International 2002; 130S:S8-S20. (Belgium)

How can the pacifier keep the airway open while sleeping if it falls out within 30 minutes after the infant falls asleep?

ESPECIALLY since most deaths occur late at night!

Articles that state pacifiers fall out:

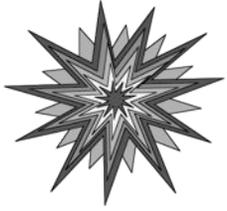
Patricia Franco, Sonia Scaillet, Vaness Wermenbol, Andre Kahn et al. *The influence of a pacifier on infants arousal from sleep.* J Pediatr, June 2000. 136(6):775-9.

Weiss PPW, Kerbl R. *The relatively short duration that a child retains a pacifier in the mouth during sleep: implications for sudden infant death syndrome.* Eur J Pediatr. 2001;60:160.

Even Mitchell EA, Blair PS, L'Hoir MP admit that pacifiers fall out within 30 minutes in their own article:

Mitchell EA, Blair PS, L'Hoir MP. *Should pacifiers be recommended to prevent sudden infant death syndrome?* Pediatrics. **2006** May;117(5):1755-8.

Since the pacifier falls out of the mouth shortly after an infant falls asleep, and the highest incidence of SIDS occurs in the later hours of the night, the assumption that the pacifier holds the airway open while the infant is asleep is invalid - because the pacifier is not even in the mouth during the time when most SIDS events occur.



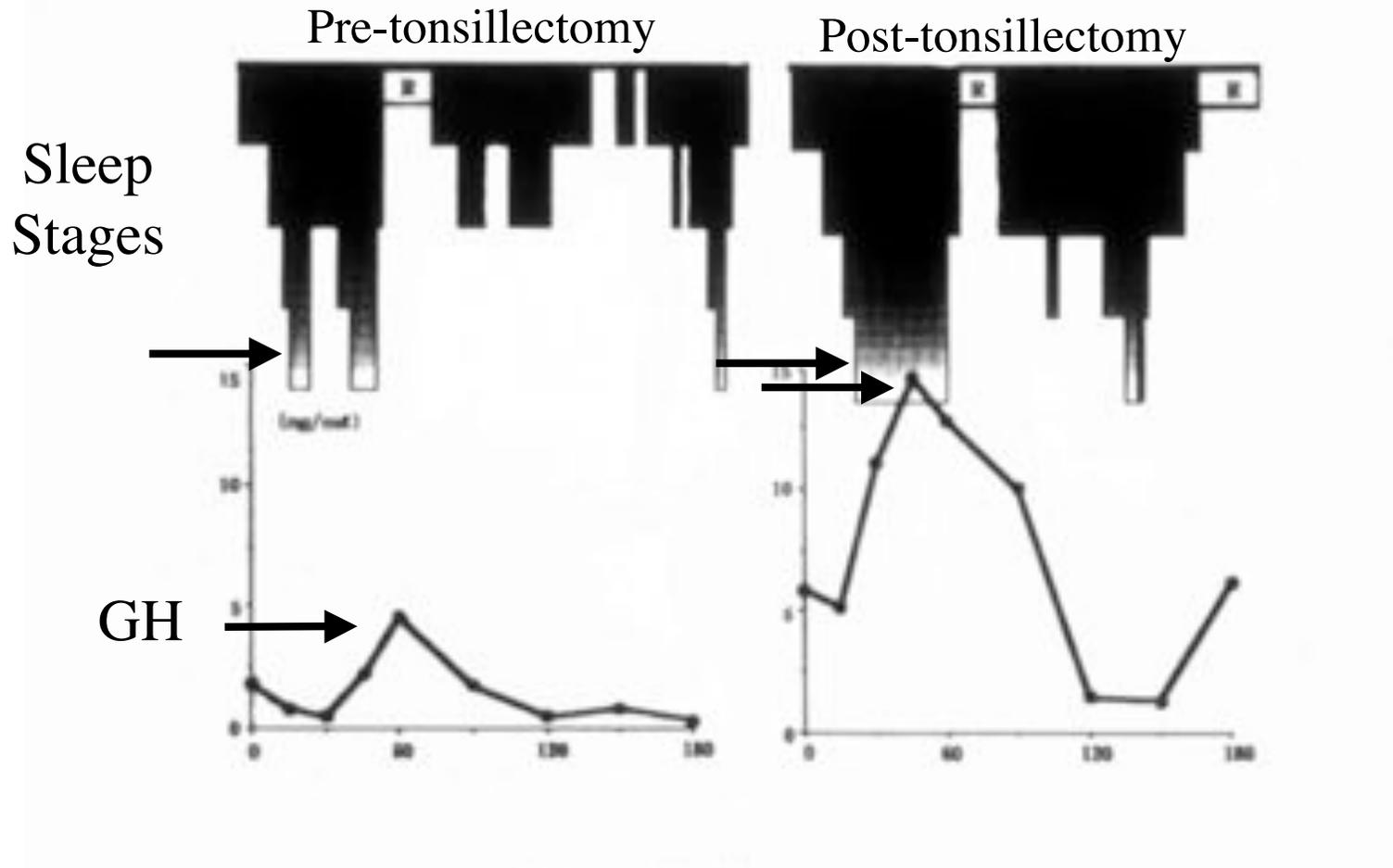
It is impossible for pacifiers to open
the airway while sleeping if the
pacifier falls out of the mouth shortly
after the infant falls asleep!

Assumption #2 is invalid!

Some believe that pacifiers may keep an infant in a lighter stage of sleep, and therefore more alert to respond if they are having a breathing challenge - but do they understand the consequences of an infant not getting into deep sleep?

Growth Hormone (GH) gets secreted during deep sleep.

An example of 'Hormonal orchestration' that occurs during sleep.



More Growth Hormone secreted in Stage 4.

(Research by Dr. Soichiro Miyazaki (Japan))

How important is it for infants
to get Growth Hormone?

Those who recommend the use of
pacifiers will have to decide that!

Assumption #3

Breastfeeding is not
protective against SIDS.

L'Hoir article - Not referenced in Policy Statement
- but 3 other L'Hoir articles were.

“The fear that dummy use might stand in the way of breastfeeding is irrelevant to cot death cases, because most cot death mother did not breastfeed their infants anyhow...

Only 10% of Dutch cot death mothers do so.”

Therefore: 90% on SIDS cases are bottle-fed and use pacifiers!

Why doesn't this demonstrate the importance of breastfeeding for reducing the incidence of SIDS?

L'Hoir MP, Engelberts AC et al. Risk and preventive factors for cot death in the Netherlands, a low-incidence country. Eur J Pediatr. 1998 Aug;157(8):681-8.

March 2009 article

Vennemann MM, Bajanowski T, Brinkmann B, Jorch G, Mitchell EA et al. *Does breastfeeding reduce the risk of sudden infant death syndrome?* 2009 Mar;123(3):e406-10. PMID: 19254976

“Breastfeeding reduces the risk of SIDS.”

Vennemann *et al. Pediatrics*. March 2009.

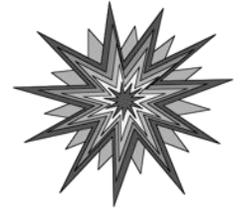
“Most SIDS cases (59%) occurred between ages 2 and 5 months.”

Results: “Exclusive breastfeeding at 1 month of age halved the risk.”

“This study shows that breastfeeding reduced the risk of SIDS by approximately 50% at all ages throughout infancy.”

“We recommend including the advice to breastfeed through 6 months of age in SIDS risk-reduction messages.”

Vennemann MM, Bajanowski T, Brinkmann B, Jorch G, Mitchell EA
et al. *Does breastfeeding reduce the risk of sudden infant death
syndrome?* 2009 Mar;123(3):e406-10. PMID: 19254976



Assumption #3 that breastfeeding is not protective against SIDS is invalid!

Assumption #4

Breastfeeding is not protective
against otitis media.

Aniansson research:

The AOM frequency was significantly lower in the breastfed than in the non-breast-fed child.

The first AOM episode occurred significantly earlier in children who were weaned before 6 months of age.

Aniansson G, Alm B, Andersson B, Håkansson A, Larsson P, Nylén O, Peterson H, Rignér P, Svanborg M, Sabharwal H, et al. *A prospective cohort study on breast-feeding and otitis media in Swedish infants*. *Pediatr Infect Dis J*. 1994 Mar;13(3):183-8.

Warren research:

Results: analyses showed that **pacifier use was significantly** associated with occurrence of otitis media.

Warren JJ, Levy SM, Kirchner HL, Nowak AJ, Bergus GR *Pacifier use and the occurrence of otitis media in the first year of life*. 2001 *Pediatr Dent*. Mar-Apr;23(2):103-7. PMID: 11340716

Jackson research:

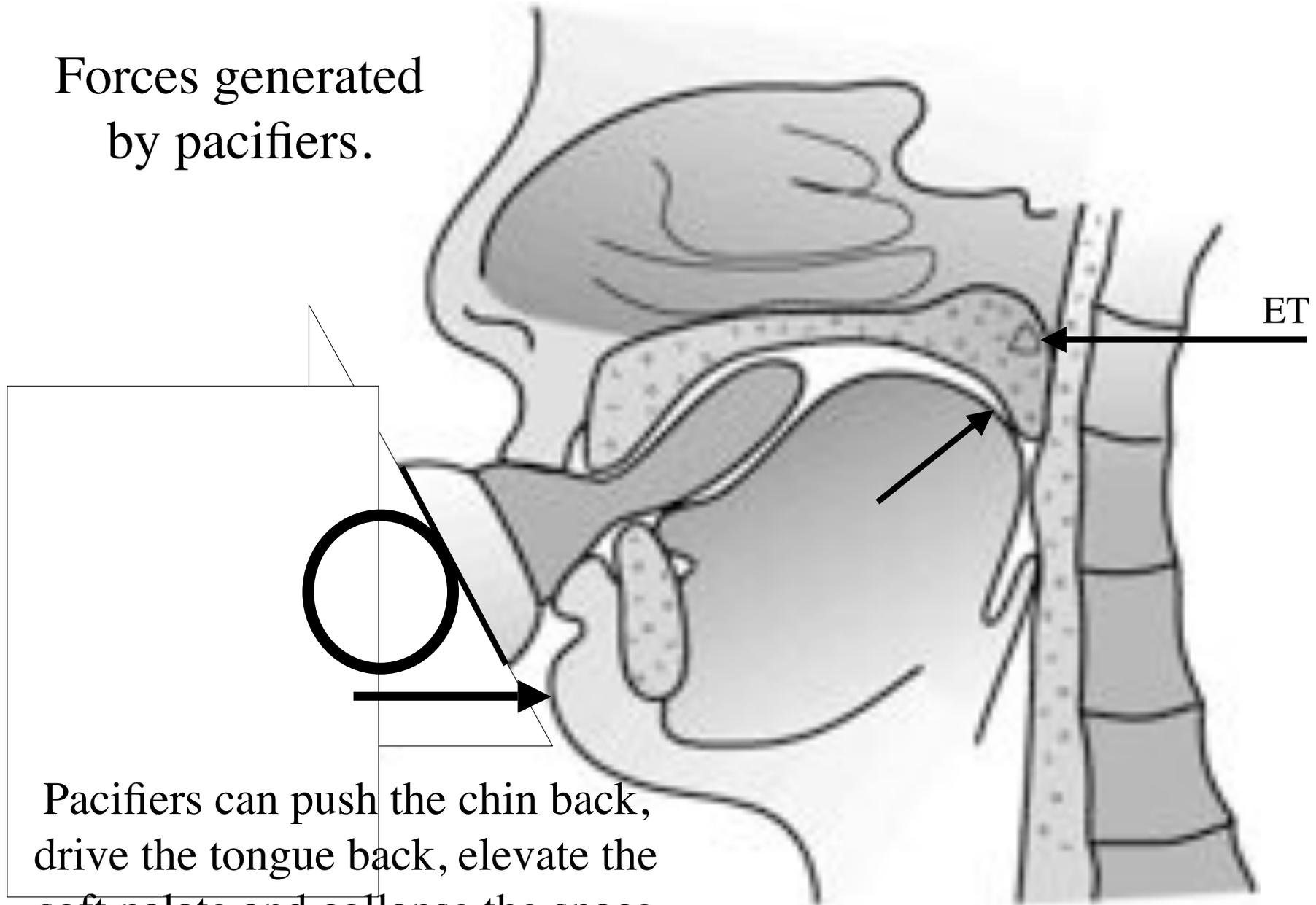
Virginia School of Dentistry.

- Prevalence of otitis media was higher in pacifier users than in non-pacifier users.
- The risk of developing OM is 2x greater if a pacifier is used and 5x greater if bottle-feeding.
- No association was found between otitis media and breastfeeding.

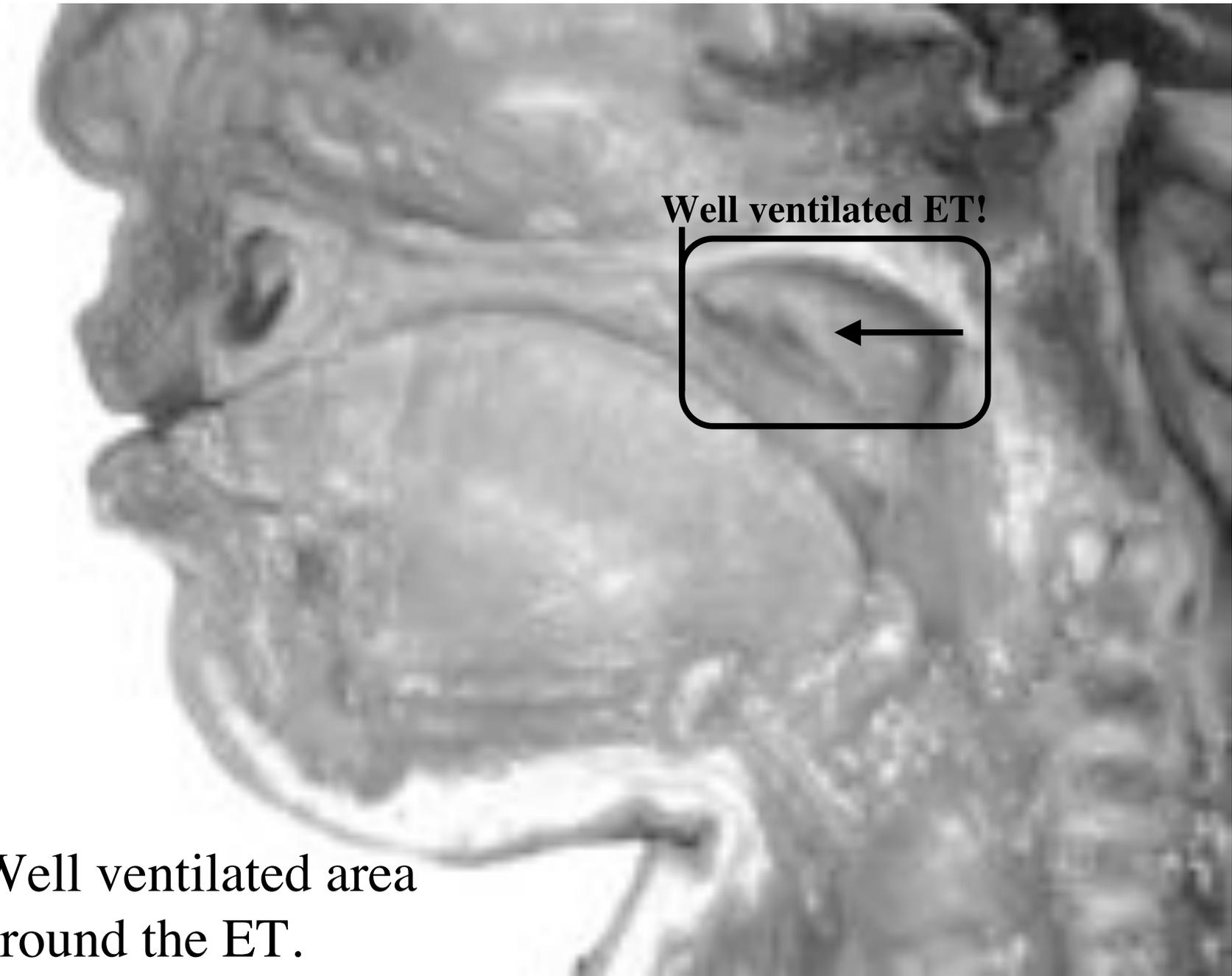
Jackson JM, Mourino AP. Pacifier use and otitis media in infants twelve months of age or younger. *Pediatr Dent*. 1999 Jul-Aug;21(4):255-60.

Looking at the relationship between
pacifier use and OM from an
anatomical perspective

Forces generated
by pacifiers.

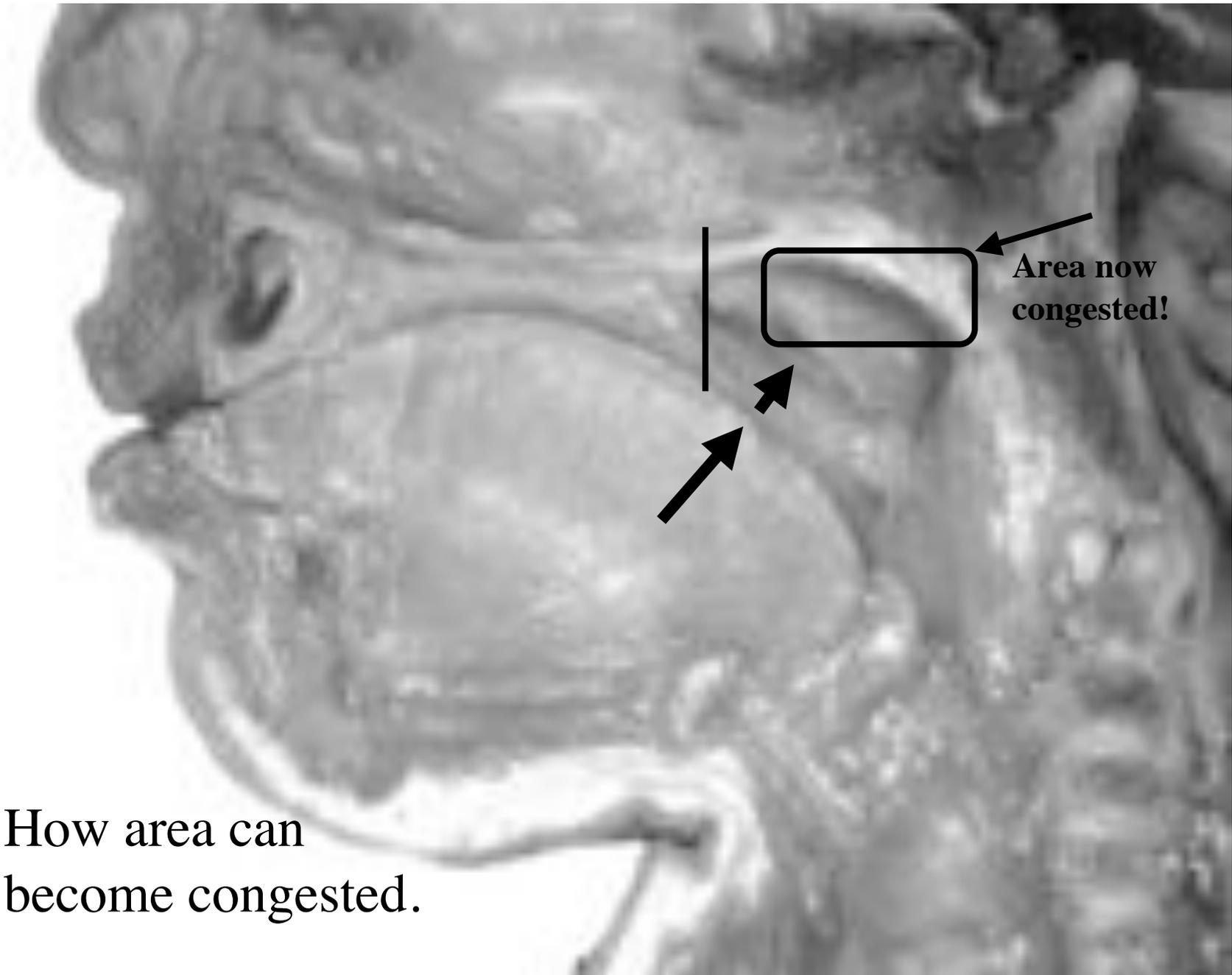


Pacifiers can push the chin back,
drive the tongue back, elevate the
soft palate and collapse the space
around the ET.



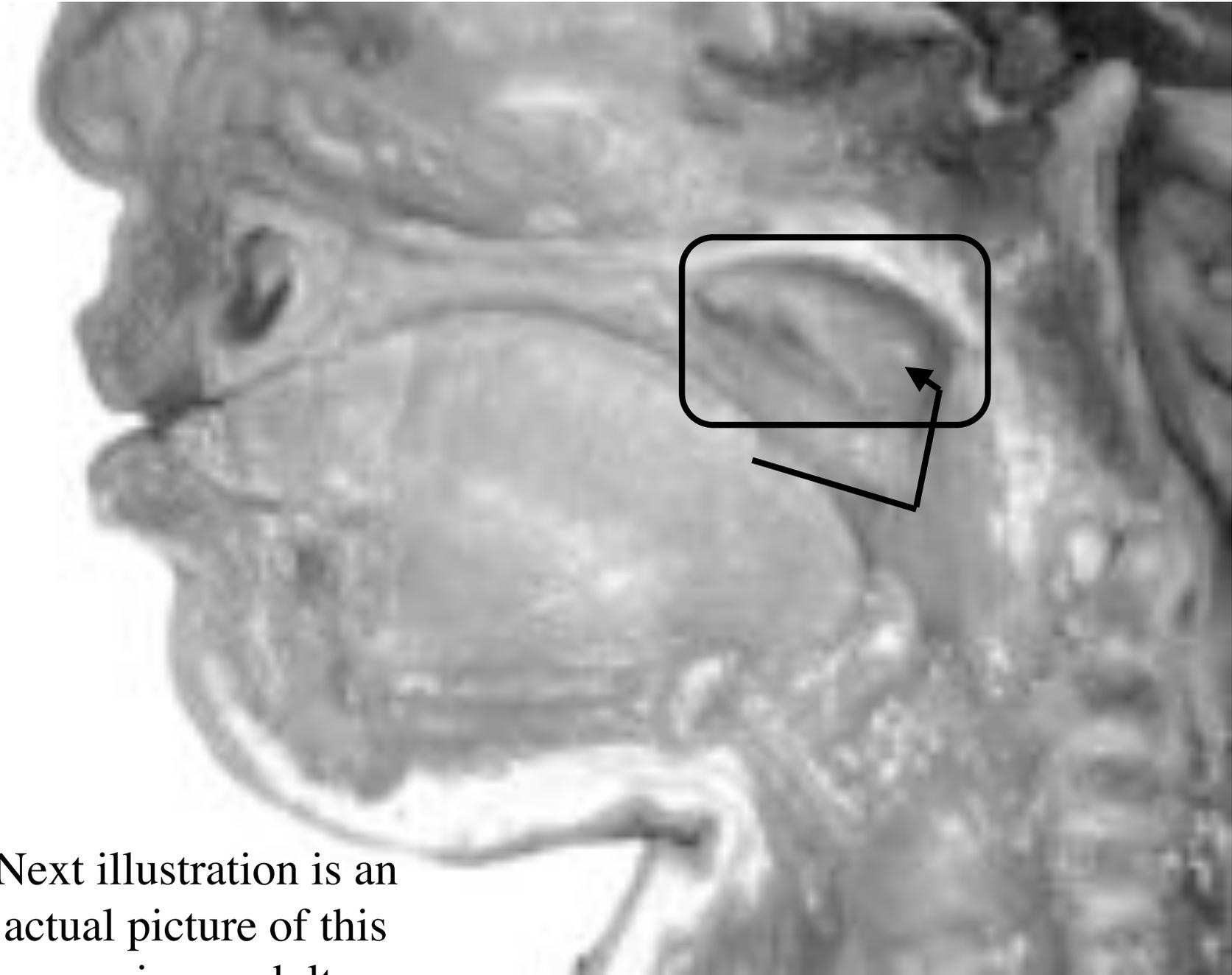
Well ventilated ET!

Well ventilated area
around the ET.

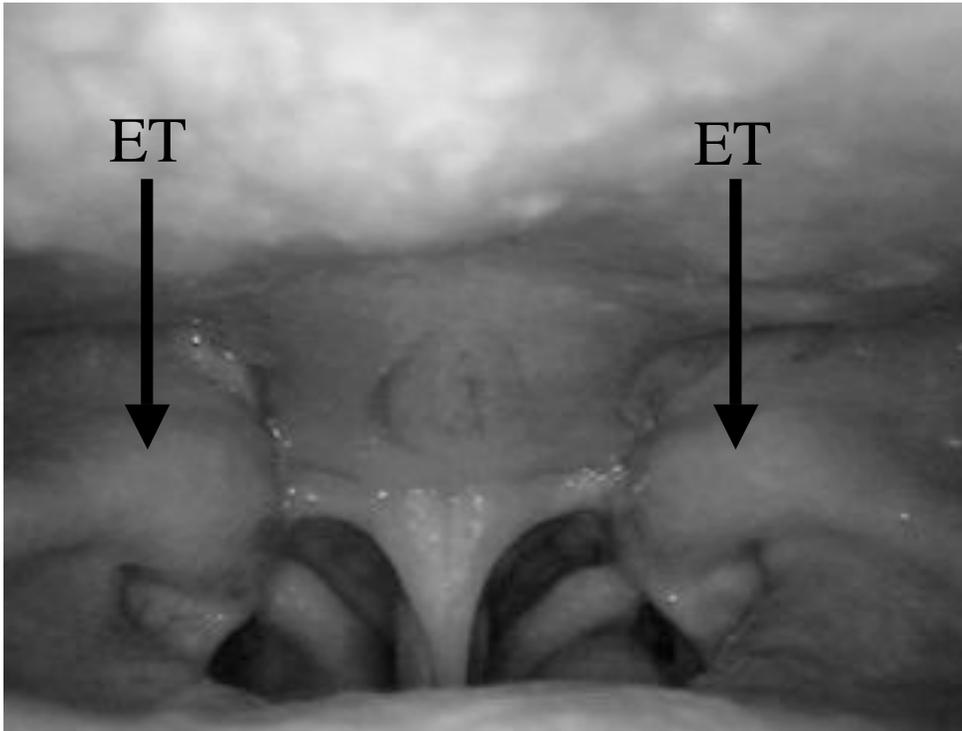


How area can
become congested.

The more congested, the greater the risk of infection.



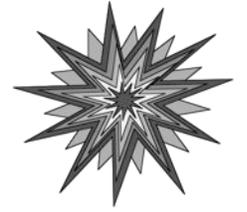
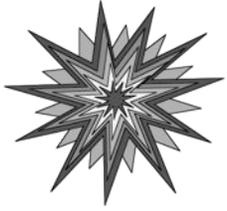
Next illustration is an actual picture of this area in an adult.



Well ventilated nasopharynx of person who was breastfed.



Congested nasopharynx of a young adult who was a preemie and was bottle-fed and used pacifiers.



Breastfeeding is protective against
Otitis Media!

Assumption #4 is invalid!

Assumption #5

The pacifier has no dental implications.

Articles I have authored that discuss oral development.

- *Snoring and Sleep Apnoea: How It Can Be Prevented in Childhood.* Breastfeeding Review. July 2006;14(2):11-14. Originally published in Germany in July 2005, **3 months prior** to the published AAP/SIDS Policy in J Pediatrics.
- The Significance of the Delivery System During Infant Feeding and Nurturing. ALCA News, April 1996 7(1):26-29.
- The Influence of Breastfeeding on the Development of the Oral Cavity: A Commentary. Journal of Human Lactation, 1998;14 (2):93-98.
- The Uniqueness of the Human Airway (Part I). Sleep Review, (March/April) 2003;4(2):40-43.
- Prevention – The key to treating OSA/SDB – (Part II). Sleep Review, (May/June) 2003;4(3):54-58.

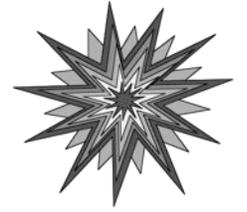
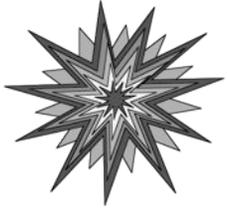
My research demonstrates
that pacifiers contribute to:

- Malocclusions such as:
 - Open bites, high palates, narrow dental arches, retruded chins, and crossbites.
- Increasing the risk of developing the malocclusions that put individuals at risk for snoring and developing obstructive sleep apnea (OSA) - a very serious and potentially deadly medical condition.

AAPD Vision Statement (1996)

- “89% of youth, ages 12 - 17 years, have some occlusal disharmony.”
- “16% of youth have a severe handicapping malocclusion that requires mandatory treatment.”

These numbers are **very significant** when one realizes that prehistoric man rarely had malocclusions!

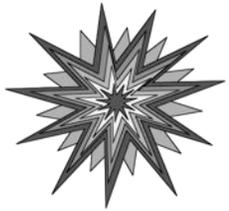


Pacifiers do have dental
consequences.

Assumption #5 is invalid!



If all principles or assumptions
of the policy are invalid - then
the policy itself is invalid!



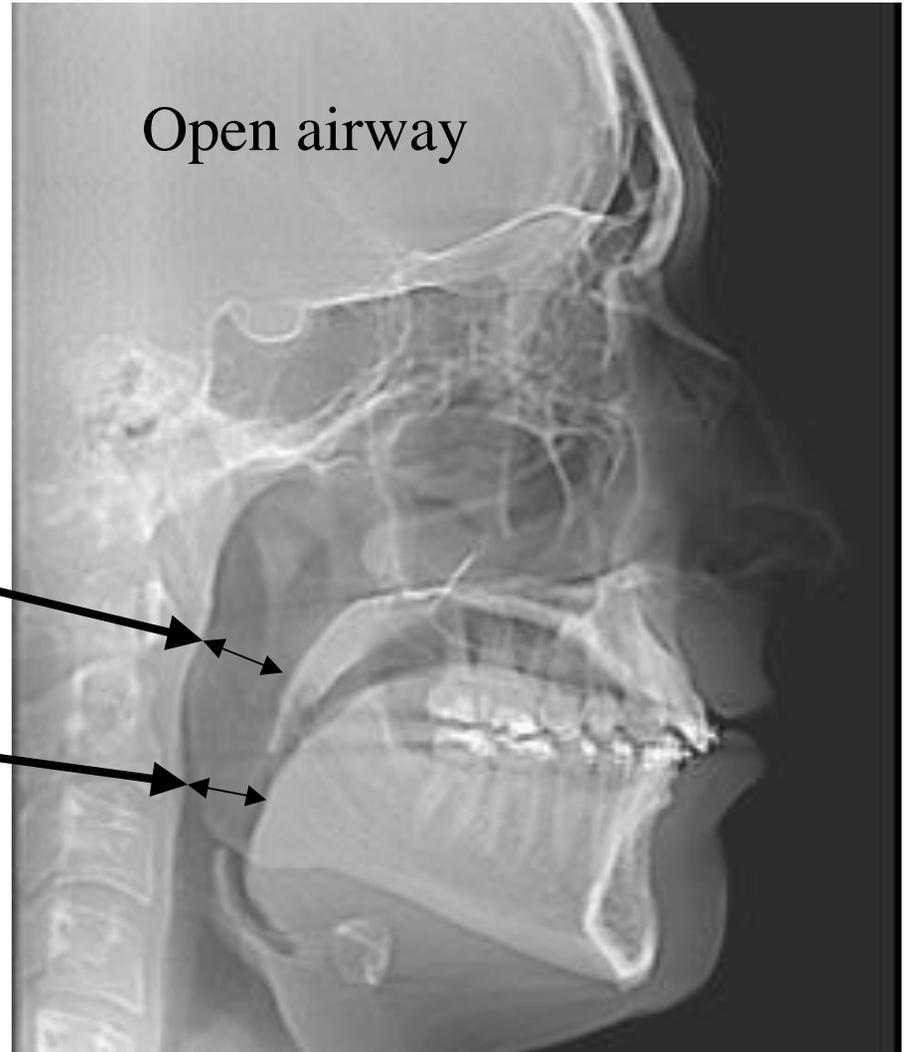
Recommendation

Scan heads of high risk and SIDS victims with 3D equipment to see if any obstructions are present and if other risk factors are present such as high palates, narrow dental arches and retruded chins.

X-ray exposure of living children is an issue.



Obstructed airway



Open airway

Open airway

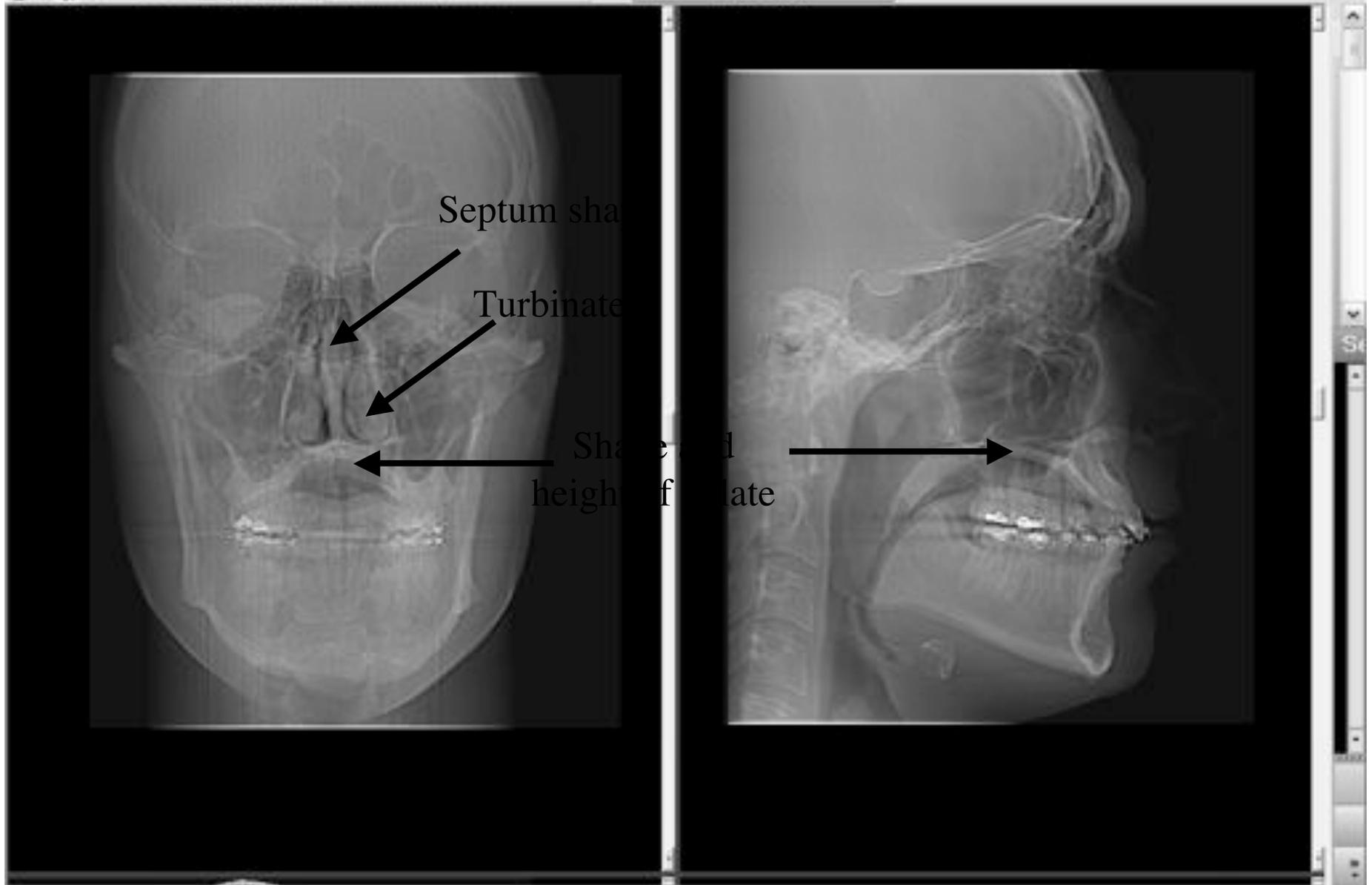
(Grant's Atlas of Anatomy, Fifth Edition,
1962, Williams & Wilkins,)



Note separation between soft palate and epiglottis.

Soft palate

Epiglottis



The oath of healthcare providers is to
'do no harm'.

Does recommending pacifiers to reduce
the risk of SIDS do any harm?

This is **your** decision to make!

**** My opinion only! ****

**Regarding AAP Position Policy on
the use of pacifiers to prevent SIDS:**

**My opinion is that the policy is not based on solid
science-based principles and has the potential to
have severe and even deadly consequences.**

I believe the policy should be retracted!

I thank you for your attention!



Brian Palmer DDS