

Infant Oral Anatomy & Tips for Keeping a Developing Mouth Happy

NM Breastfeeding
Task Force Conference
March 9 2018



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How do we get there?

- Oral Structures
- Muscles
- Cranial Nerves
- Reflexes
- Healthy Habits

STRUCTURES

- Oral Cavity
- Pharynx- 3 parts
 - Nasopharynx*
 - Oropharynx*
 - Hypopharynx or laryngopharynx*
- Larynx

Oral Cavity

3 Main Purposes:



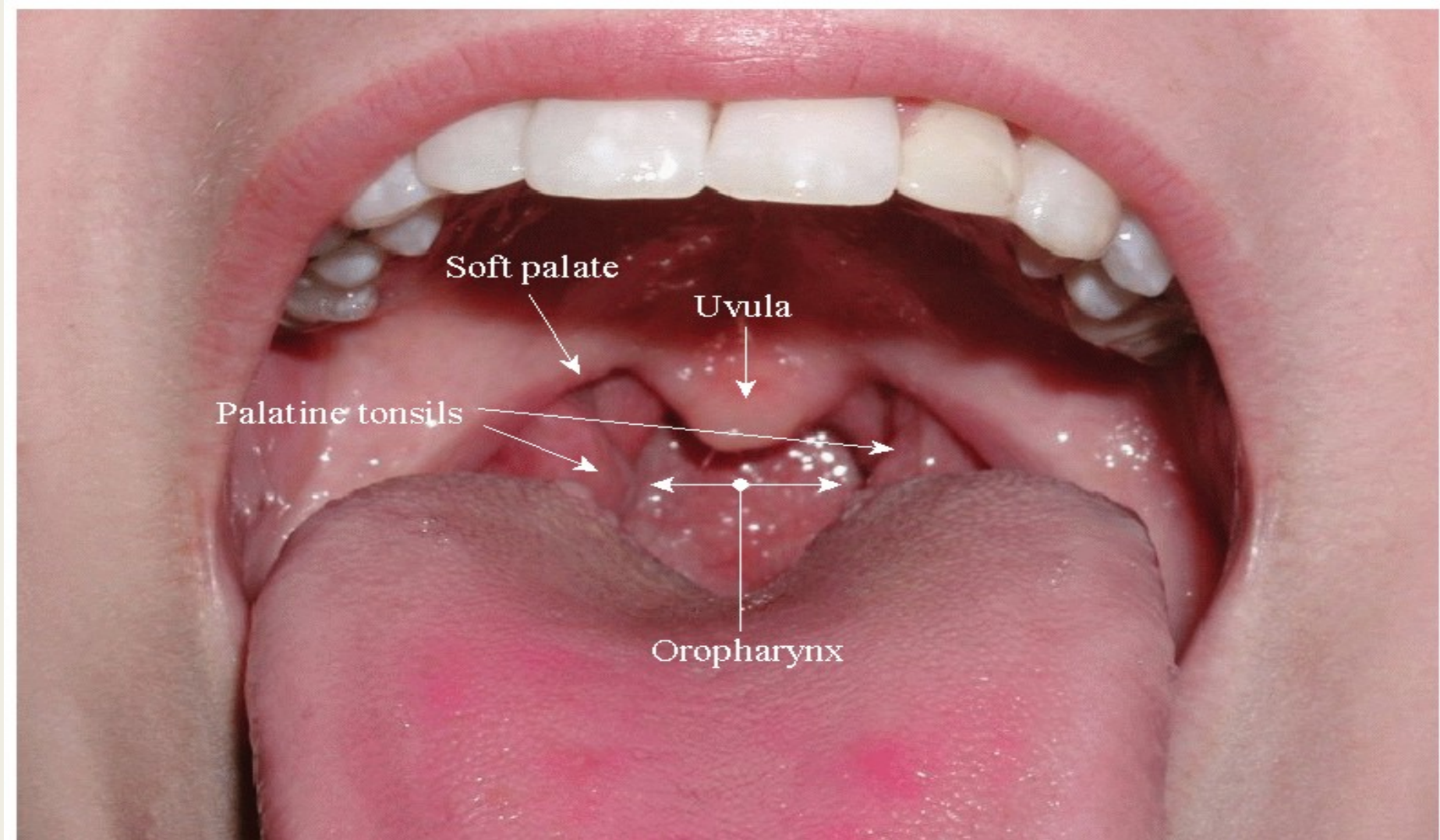
Articulation in speech

Alternate airway



Eating and drinking

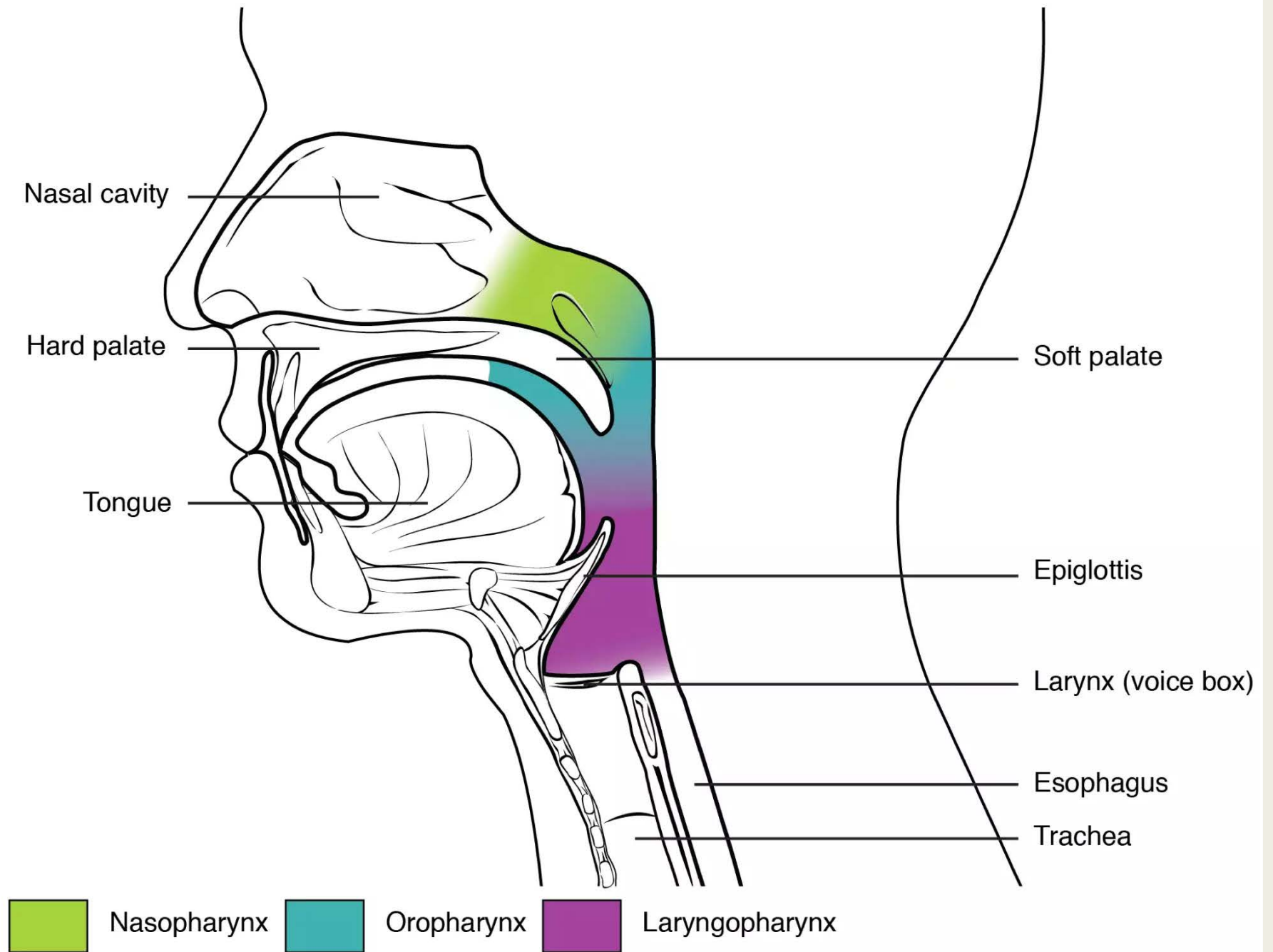




biology.clc.uc.edu/fankhauser/Labs/Microbiolo...

Parts: lips, mandible, maxilla, floor of mouth, cheeks, sulci, tongue, teeth, tonsils, hard palate, soft palate, uvula

Pharynx

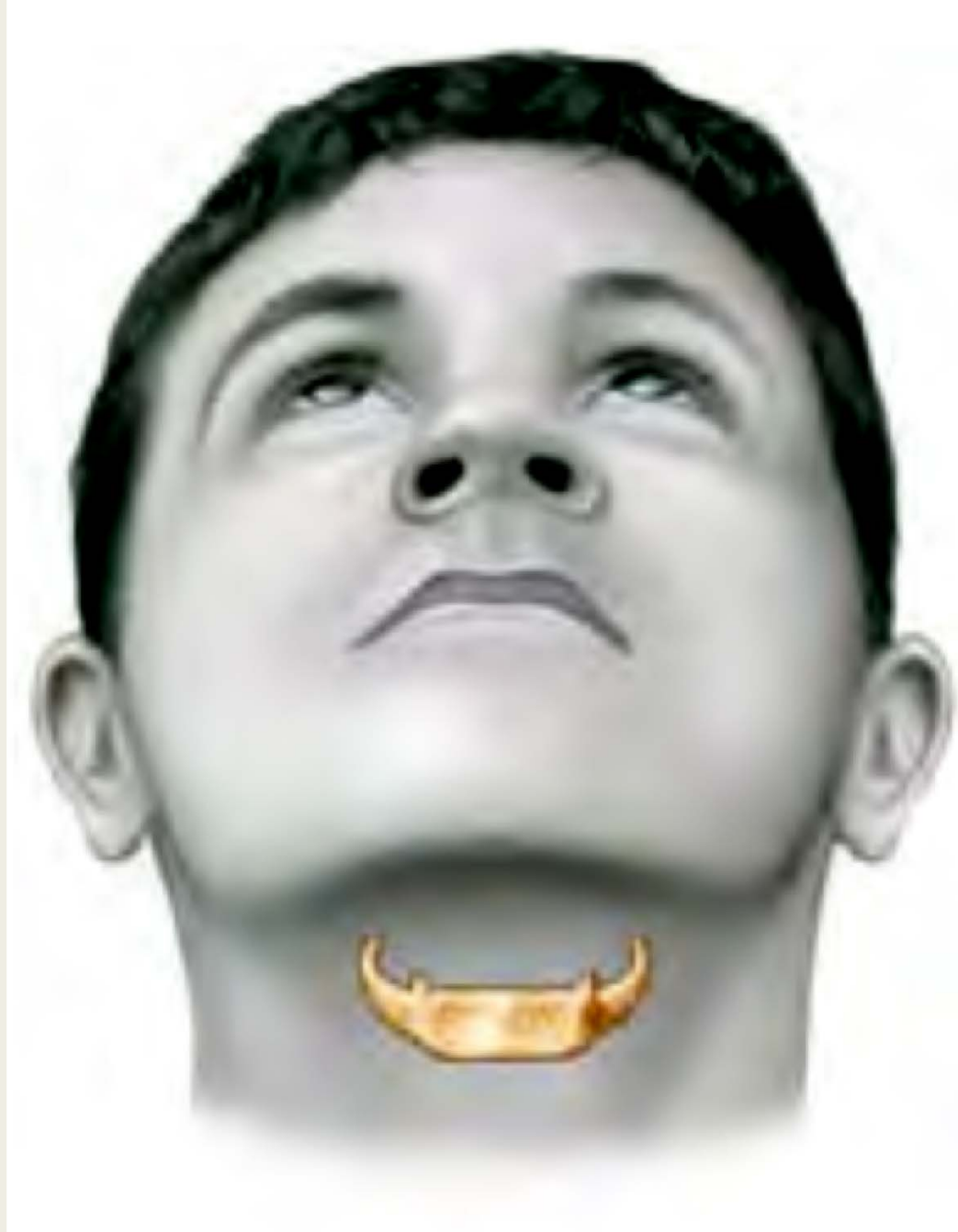


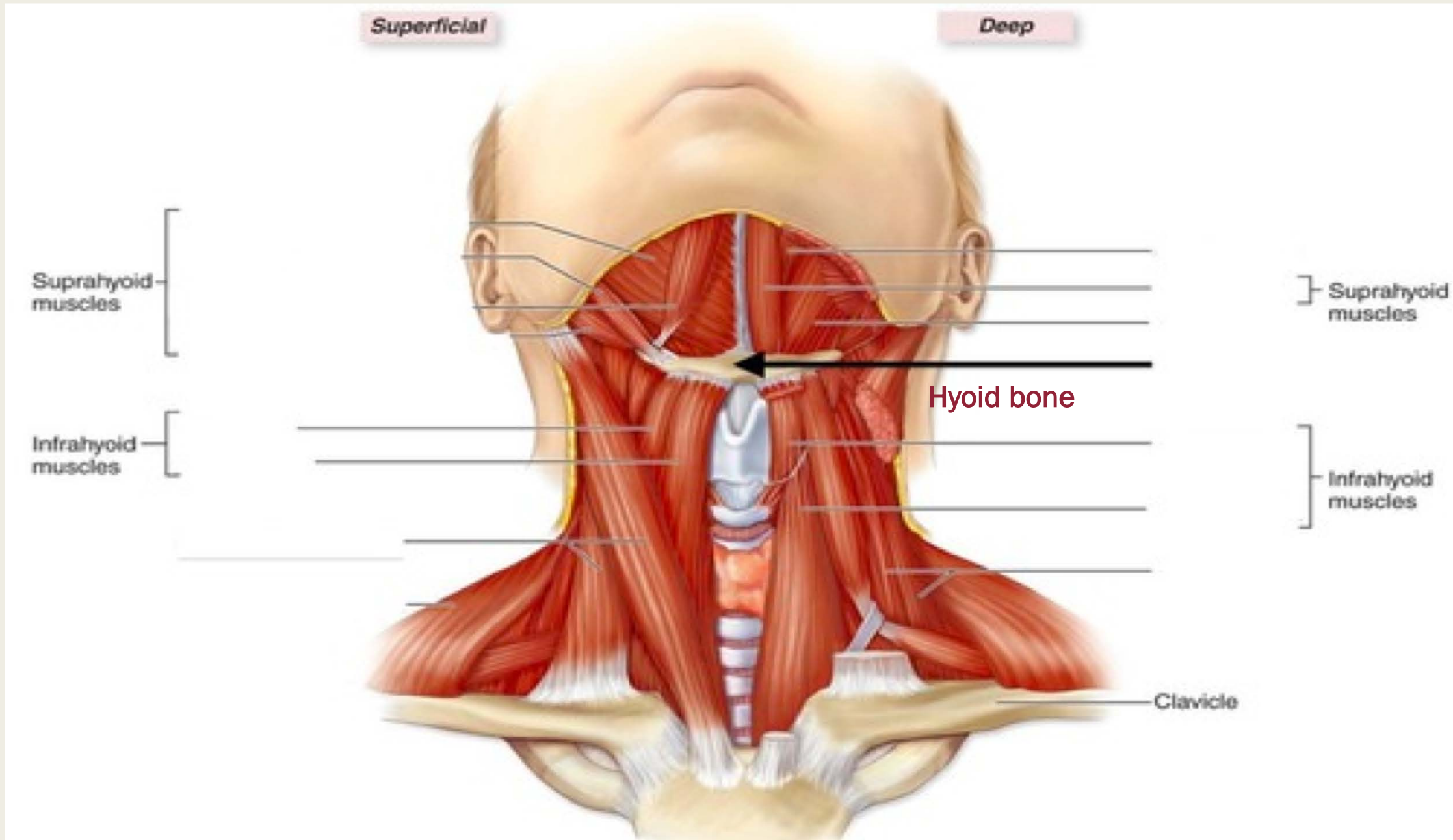
Trivia:

What is the only bone in the body that has no attachments to another bone?



Hyoid

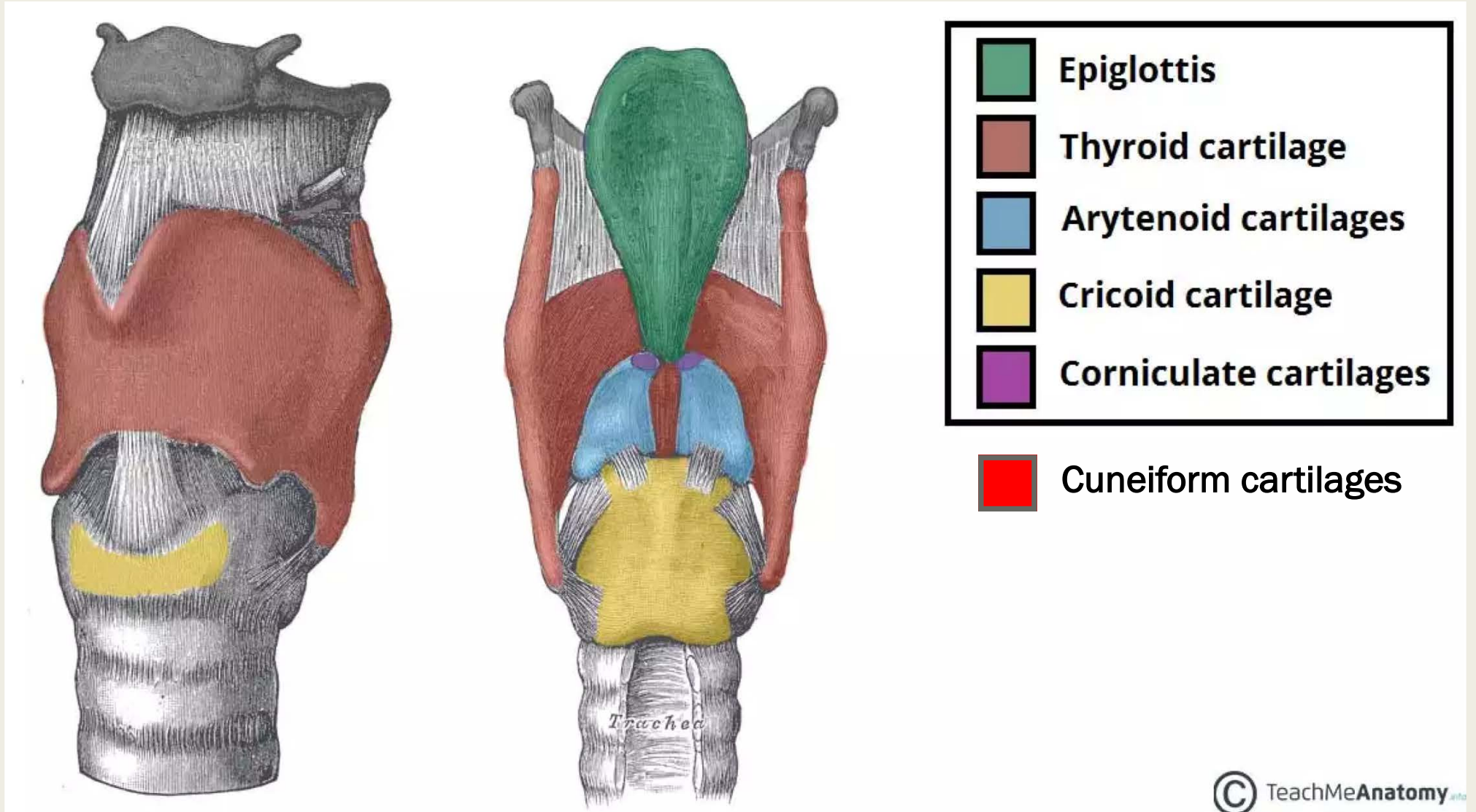




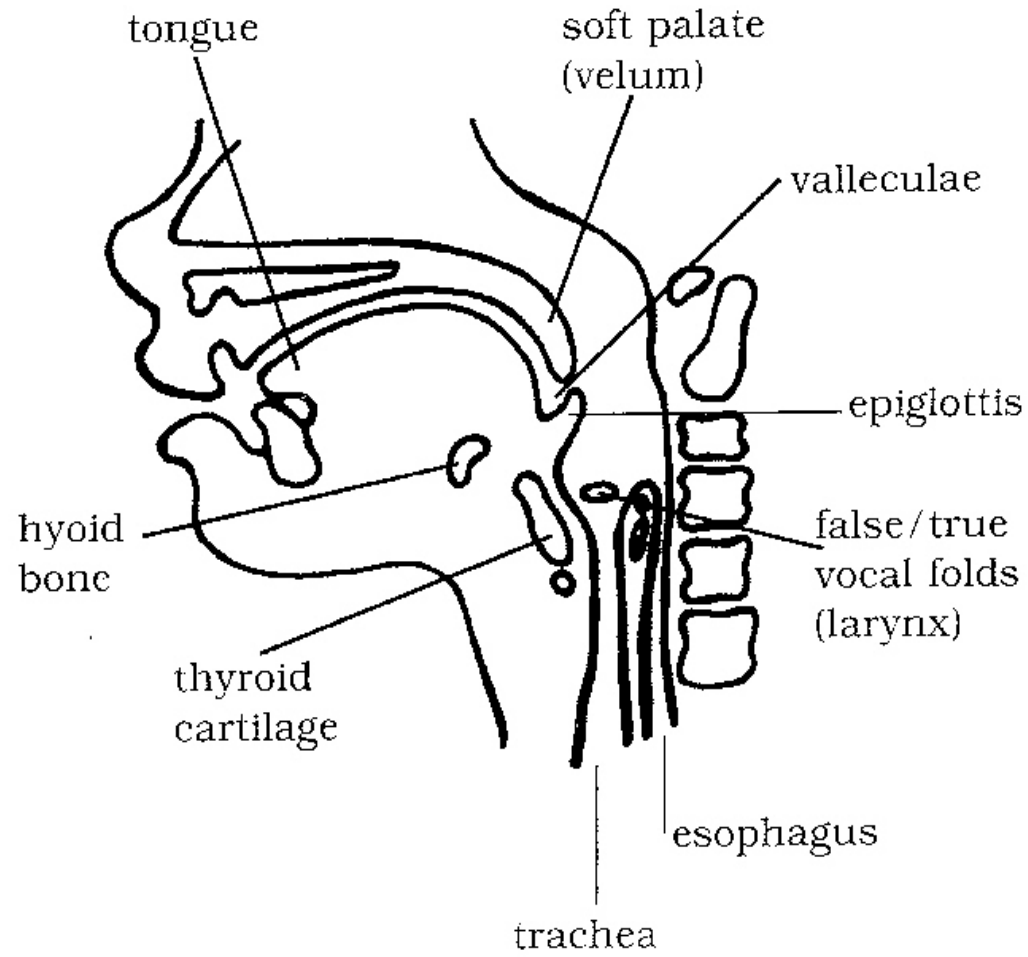
Larynx- voice box

The larynx is the part of the respiratory tract between the hypopharynx and the trachea. It's walls are made of cartilage and muscles which house the vocal cords.

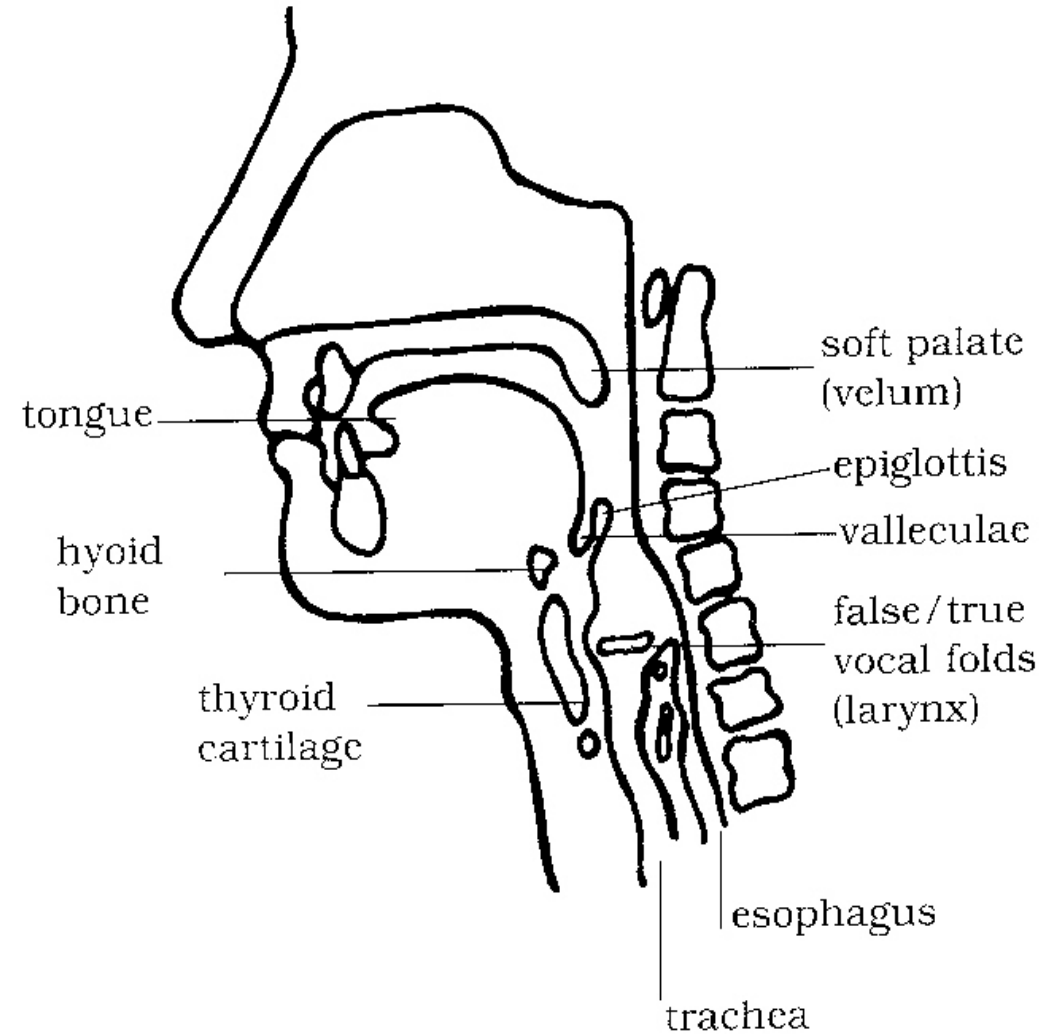
Larynx



Infant

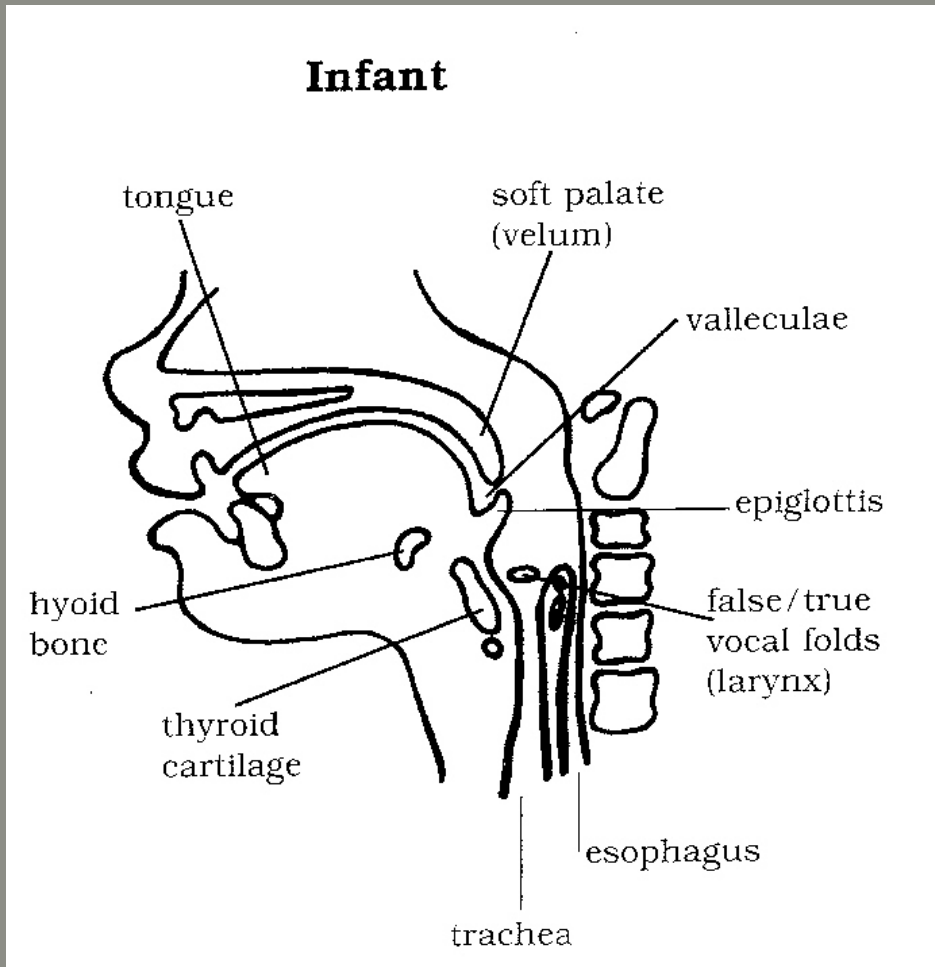


Adult

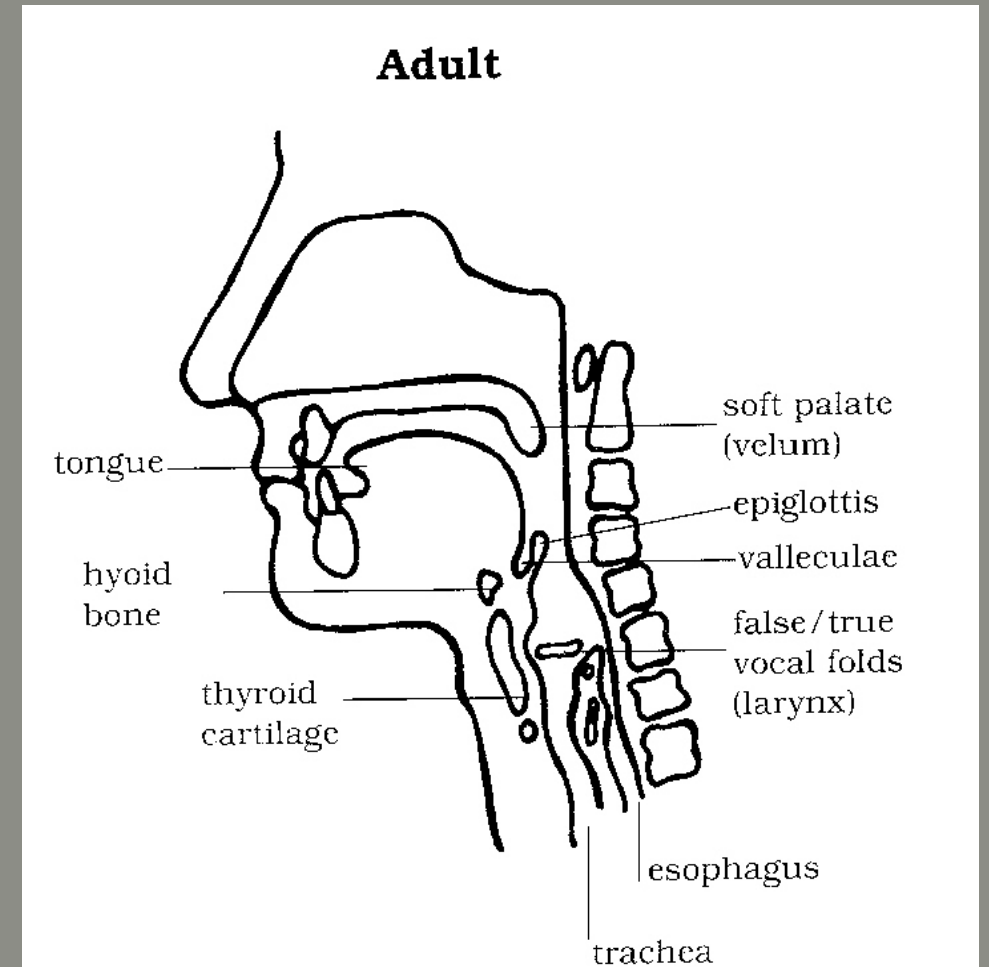


Differences Between Infant and Adult Anatomy

Connection b/w nasopharynx and hypopharynx is a gentle curve



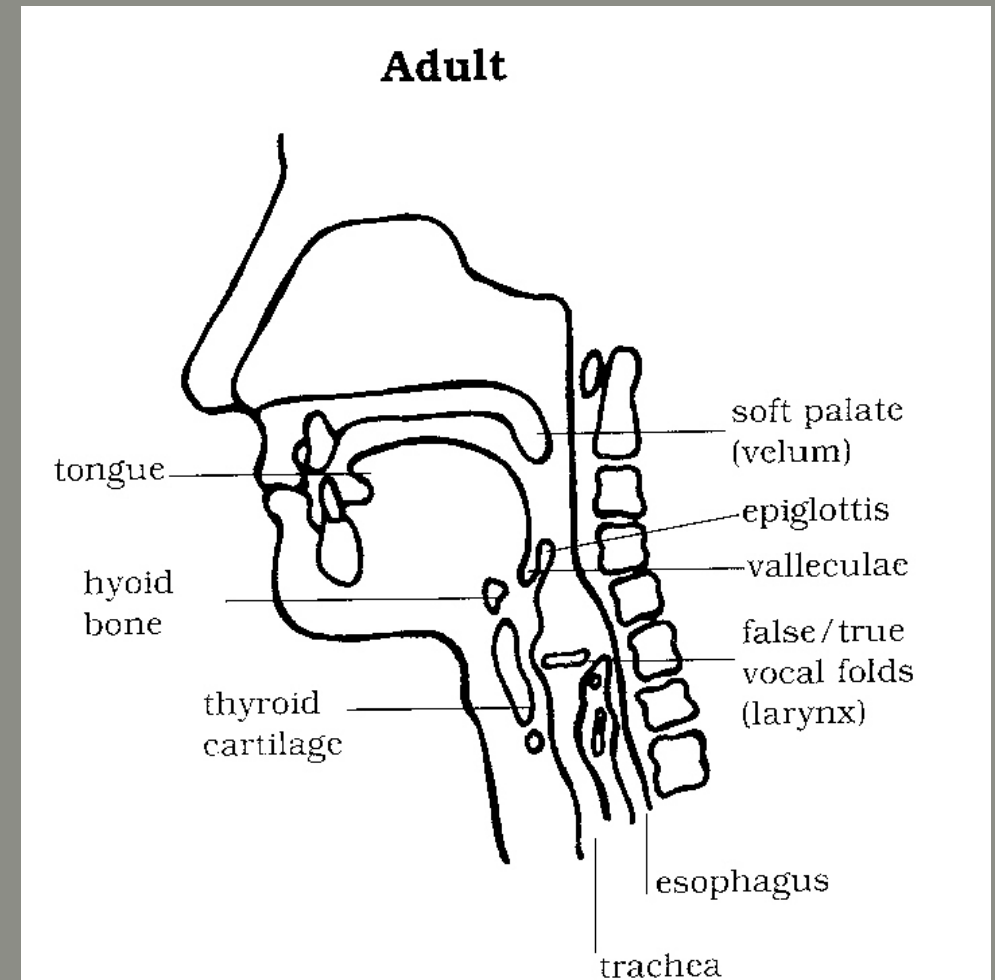
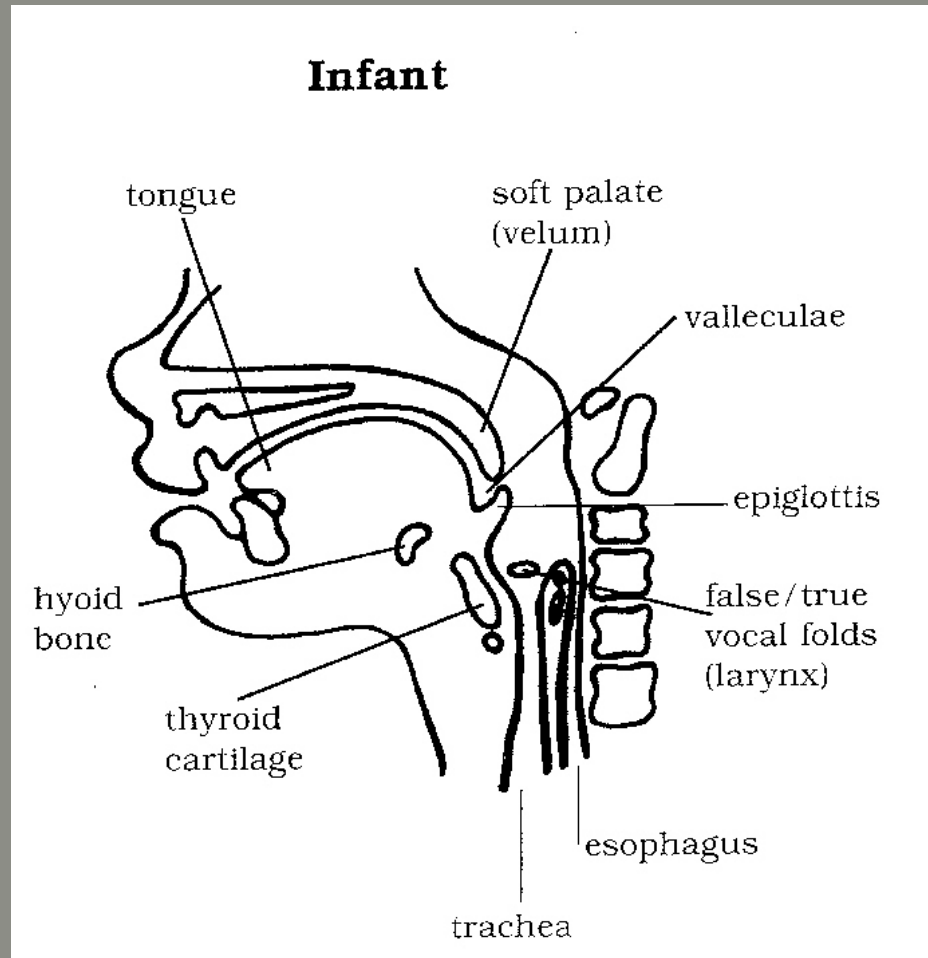
Almost a 90 degree angle b/w nasopharynx and hypopharynx



Differences Between Infant and Adult Anatomy

Tongue fills mouth and sits more anterior

Larger space for oral cavity

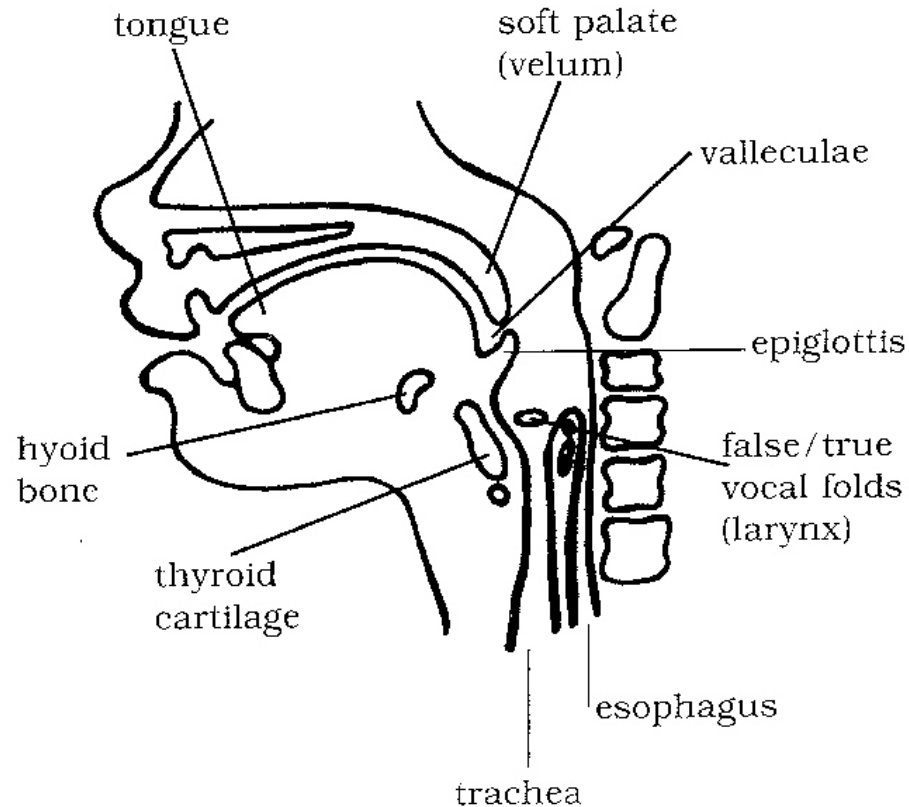


Differences Between Infant and Adult Anatomy

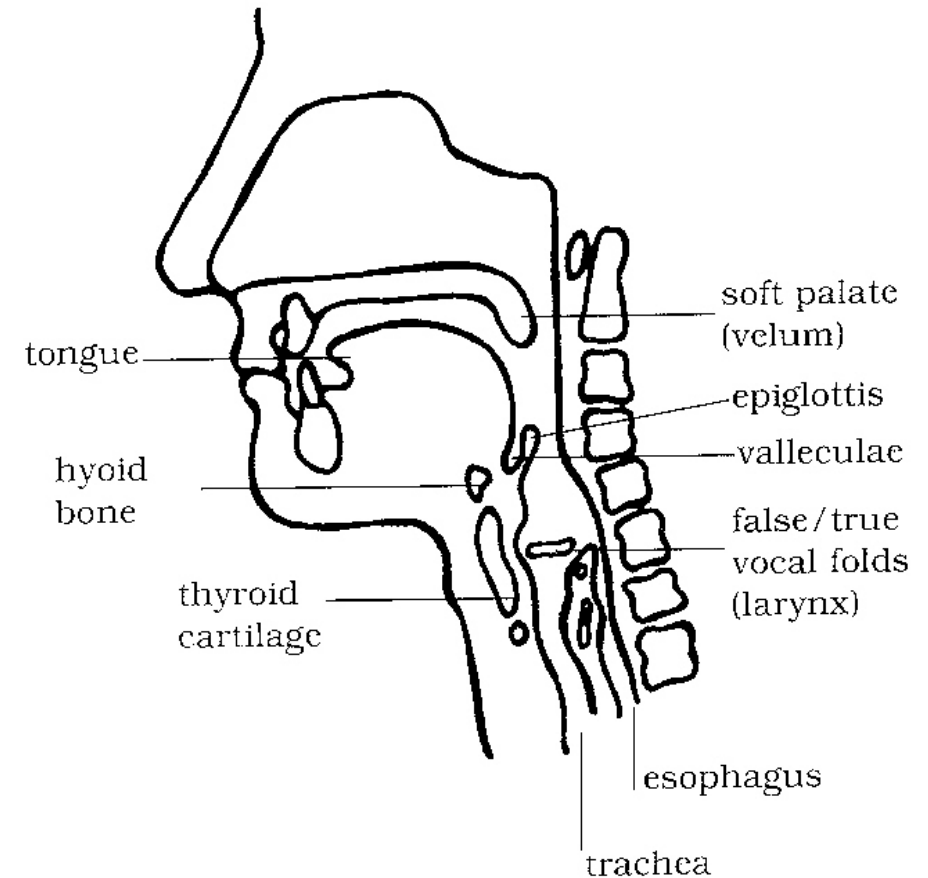
Hard palate is flat
Smaller mandible

Hard palate is arched

Infant



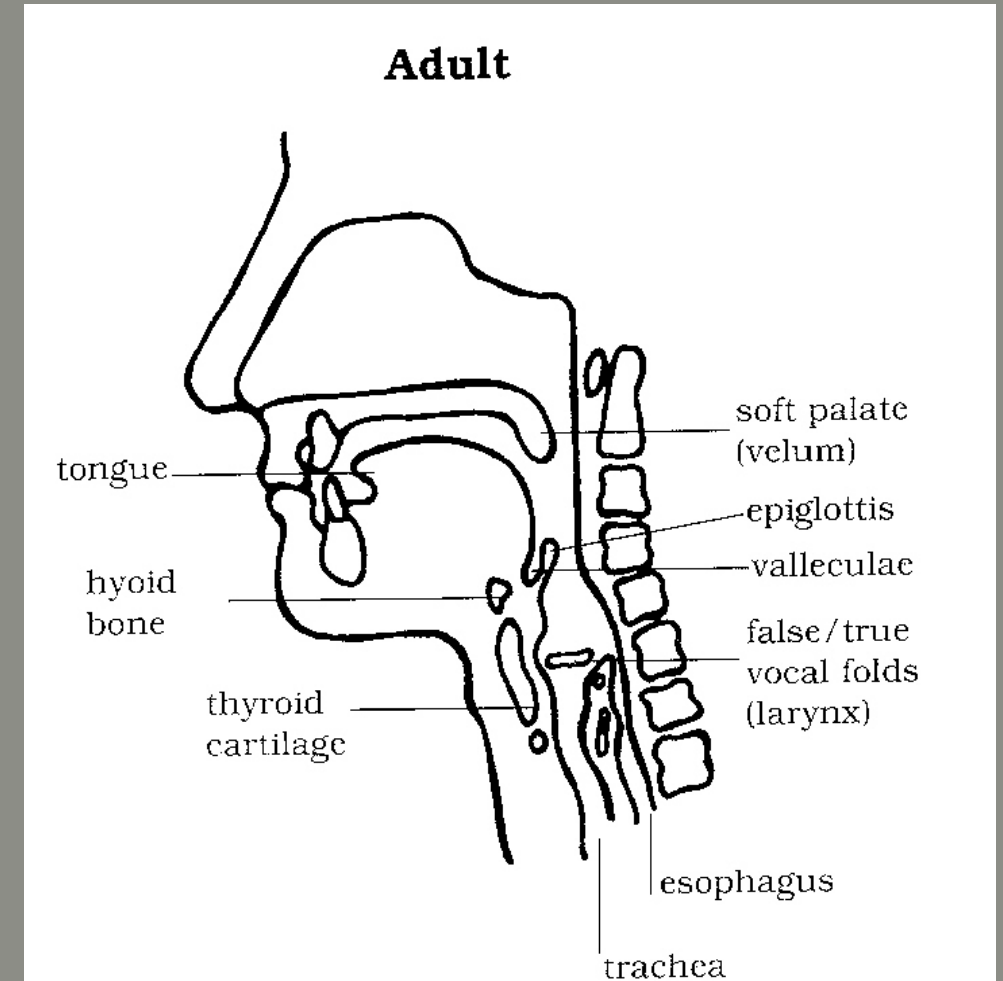
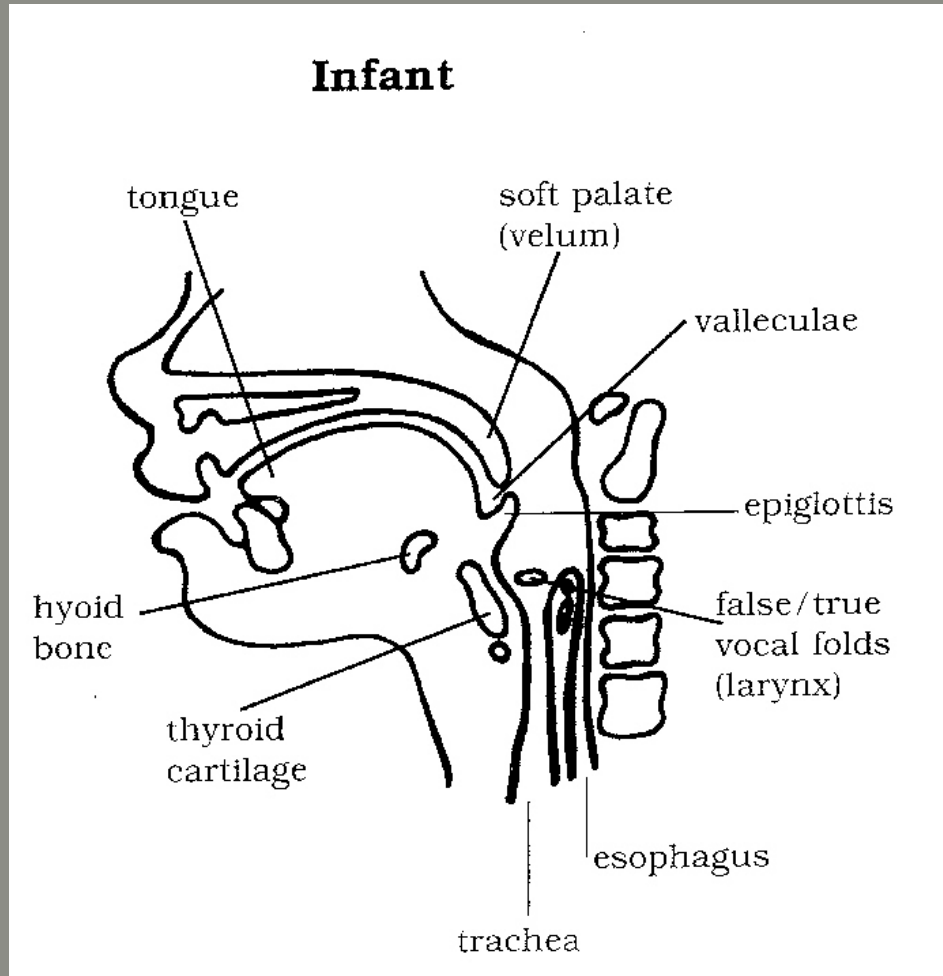
Adult



Differences Between Infant and Adult Anatomy

Tongue, soft palate, larynx, pharynx are higher

Elongated



Comparison of Structures

Infant



14 Year Old



MUSCLES



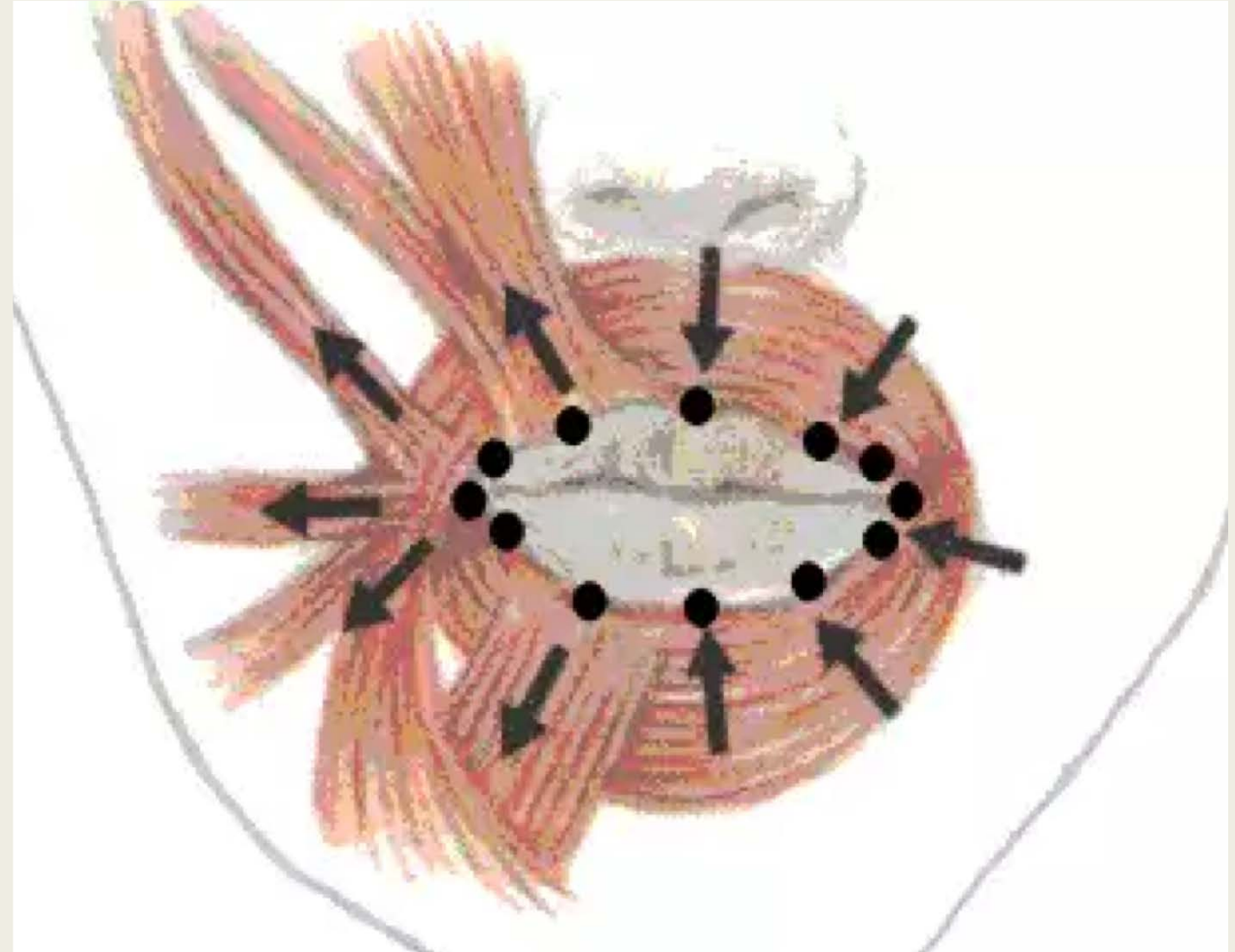
- 4 Weeks early,
- but showing off an intact and beautifully formed orbicularis oris (lip muscle)

I'm ready to eat
mom!



Orbicularis Oris- Sustained lip closure and lip rounding and tension on nipple

- Help to keep food and saliva in the mouth
- Help form speech sounds
- Contribute to facial expressions



Facial Muscles Involved in Eating and Drinking

Labial muscles:

- *Orbicularis Oris*
- *Buccinator*
- *Risorius*
- *Levator labii superioris*
- *Depressor anguli oris*
- *Levator anguli oris*
- *Zygomatic major*
- *Zygomatic minor*
- *Mentalis*
- *Depressor labii inferioris*



memegen.com



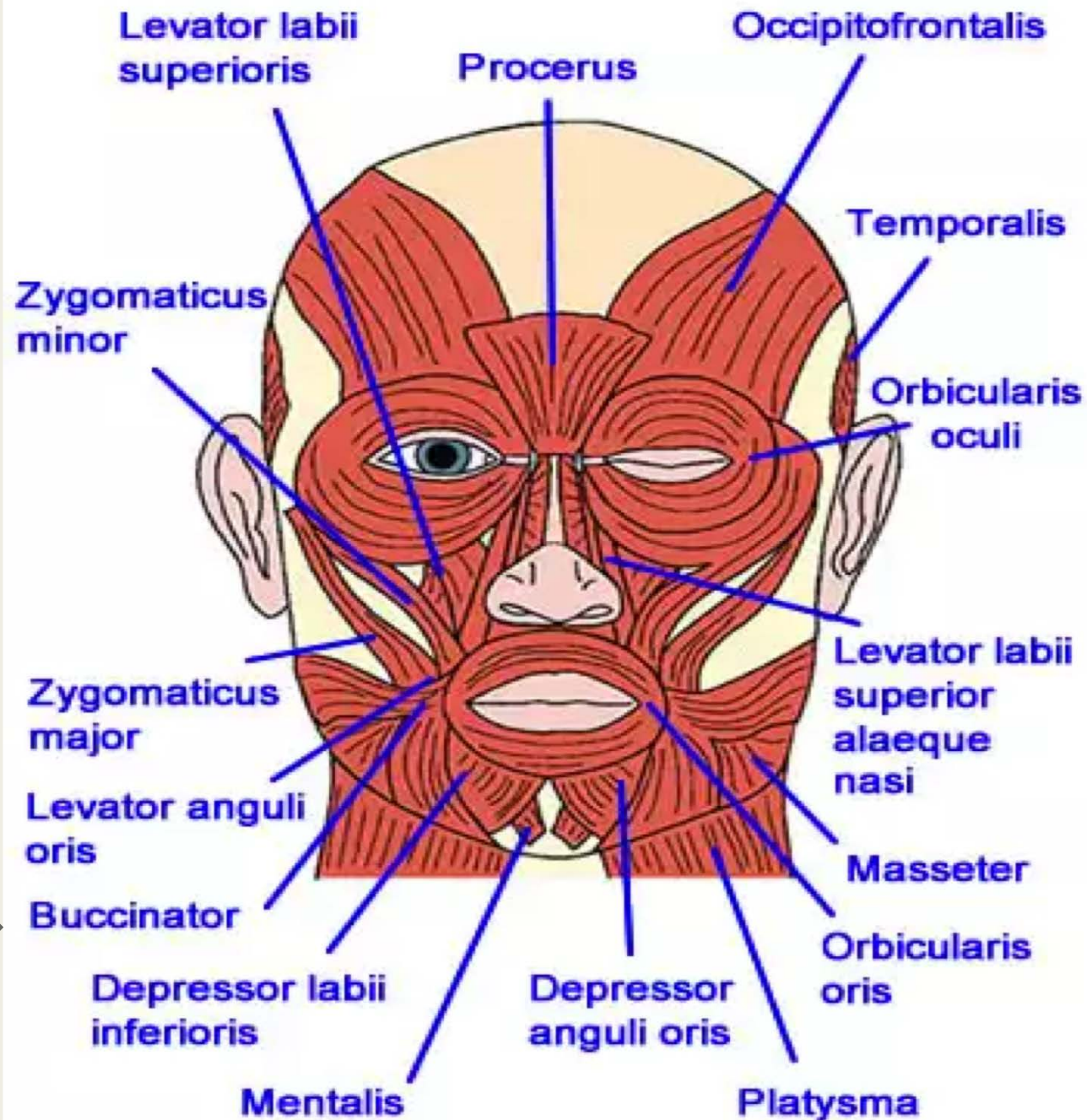
[Freedom Fighters](#)



[Parents Magazine](#)



[Real Healthy Kids](#)

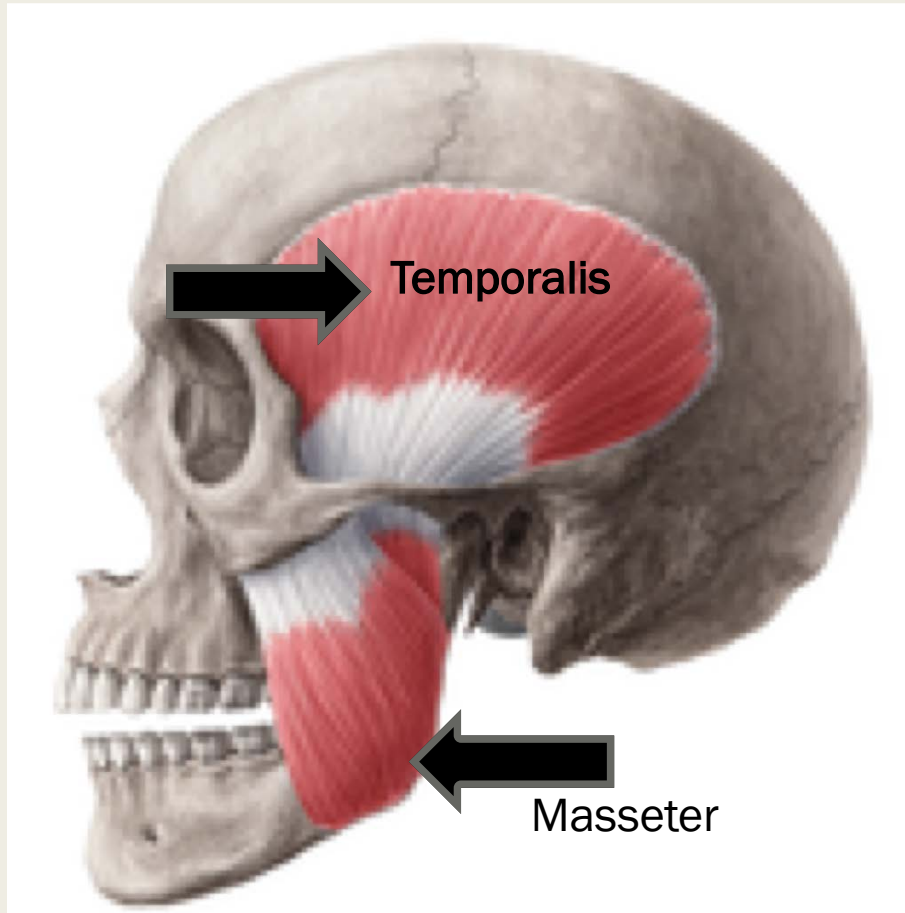


"HUMAN MUSCULAR SYSTEM: Levator Labii Superioris Alaeque Nasi Muscle." *HUMAN MUSCULAR SYSTEM: Levator Labii Superioris Alaeque Nasi Muscle*. N.p., n.d. Web. 19 Mar. 2016.

A few more important muscles

- Temporalis
- Masseter
- Medial Pterygoid
- Lateral Pterygoid

Temporalis and Masseter



- jaw stabilization
- graded jaw movements during sucking, biting, munching, and chewing
- lip closure

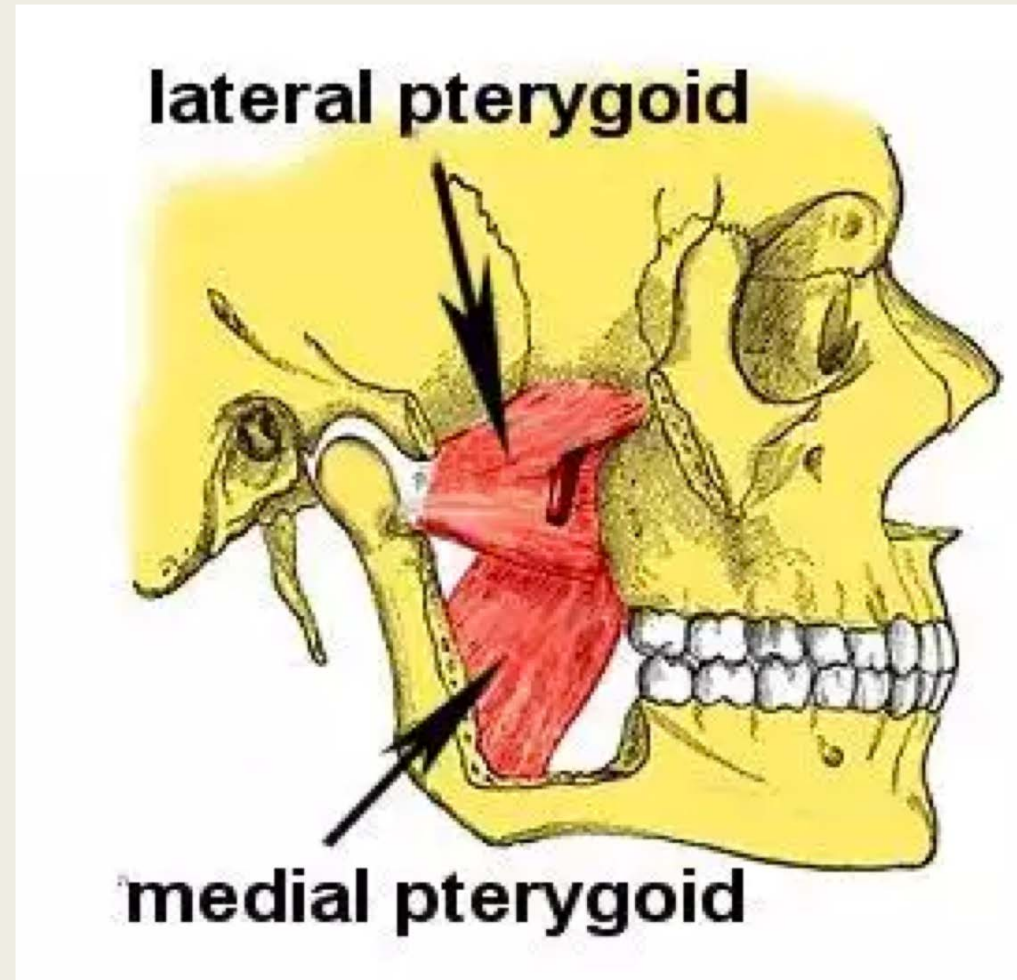
https://static.kenhub.com/images/video/muscles-of-mastication/thumb_8rgJ5ob5omYsQWQRgvShbw_Muscles_of_mastication.png

Pterygoids-

jaw stabilization

graded jaw movements during sucking

Lateral- pull
the jaw
forward



Medial-
protrude,
retract, and
move side to
side

Tongue

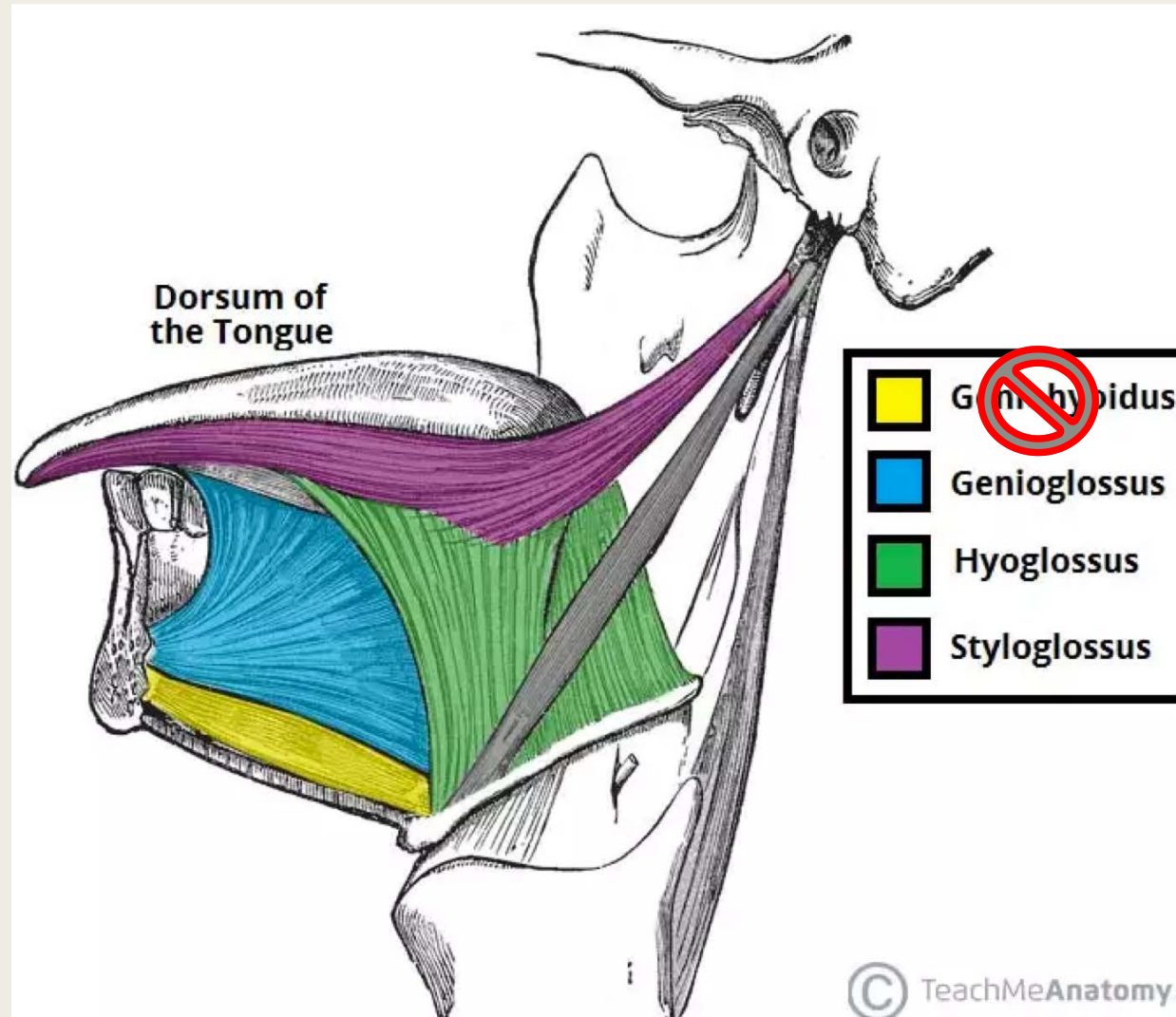
- A muscular structure with no skeletal support
- Divided into R/L halves
- 4 extrinsic muscles- originate from structures outside the tongue and insert into the tongue
- 4 intrinsic muscles- located inside of the tongue

Extrinsic Tongue Muscles

elevate, depress, protrude, retract

- Styloglossus
- Palatoglossus
- Genioglossus
- Hyoglossus

Extrinsic Tongue Muscles



Palatoglossus- not labeled here, goes from the soft palate to the tongue

Intrinsic Tongue Muscles

widen, flatten, elongate, shorten, narrow, thicken, lateralize, lift sides, raise/depress tip, convex/concave shape

- Vertical
- Transverse
- Inferior Longitudinal
- Superior Longitudinal



Intrinsic muscles

superior longitudinal muscle

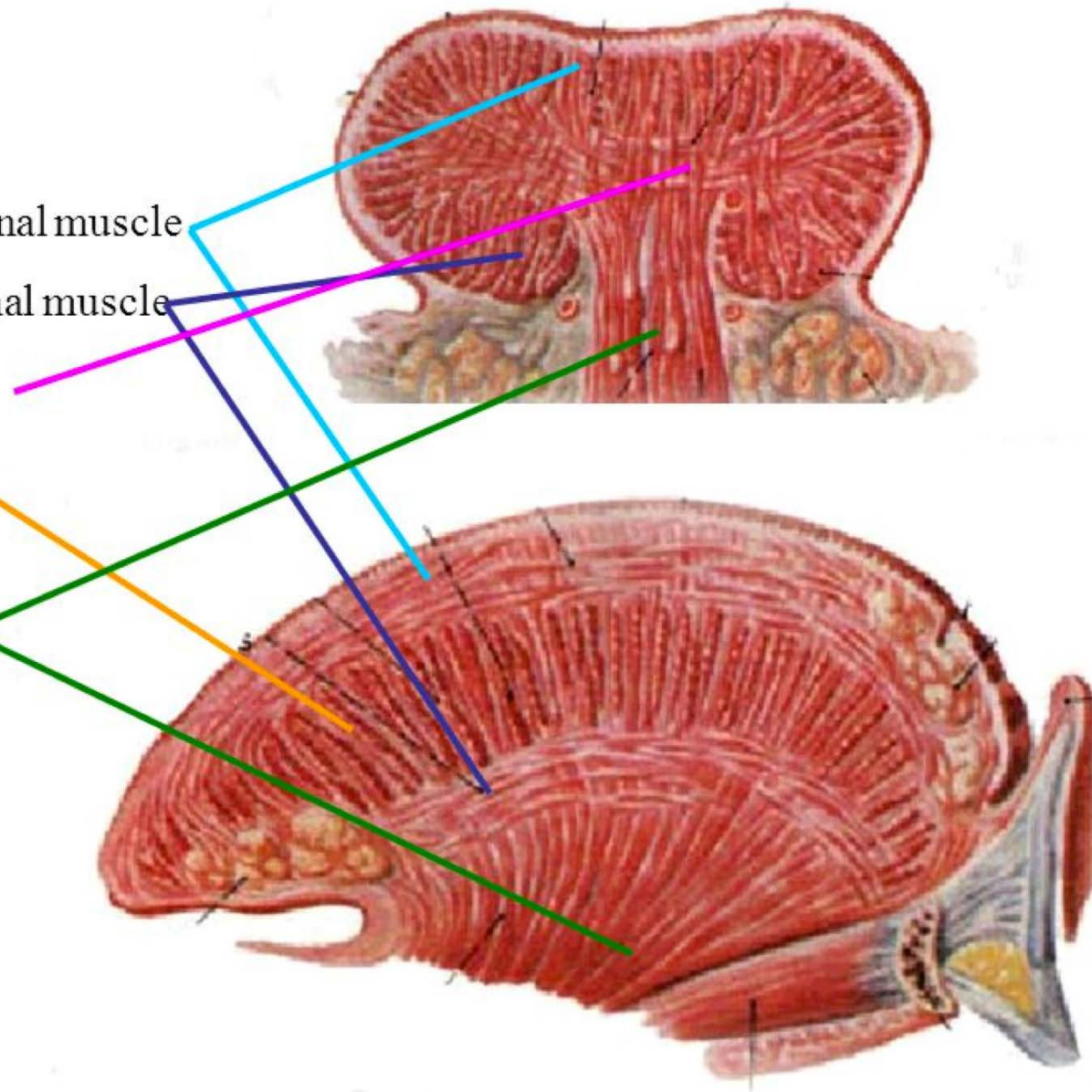
inferior longitudinal muscle

transverse muscle

vertical muscle

Extrinsic muscles

□ **genioglossus**



<http://www.flspinalcord.us/intrinsic-tongue-muscles/intrinsic-tongue-muscles-responsible-for-movement-of-tongue/>



CRANIAL NERVES

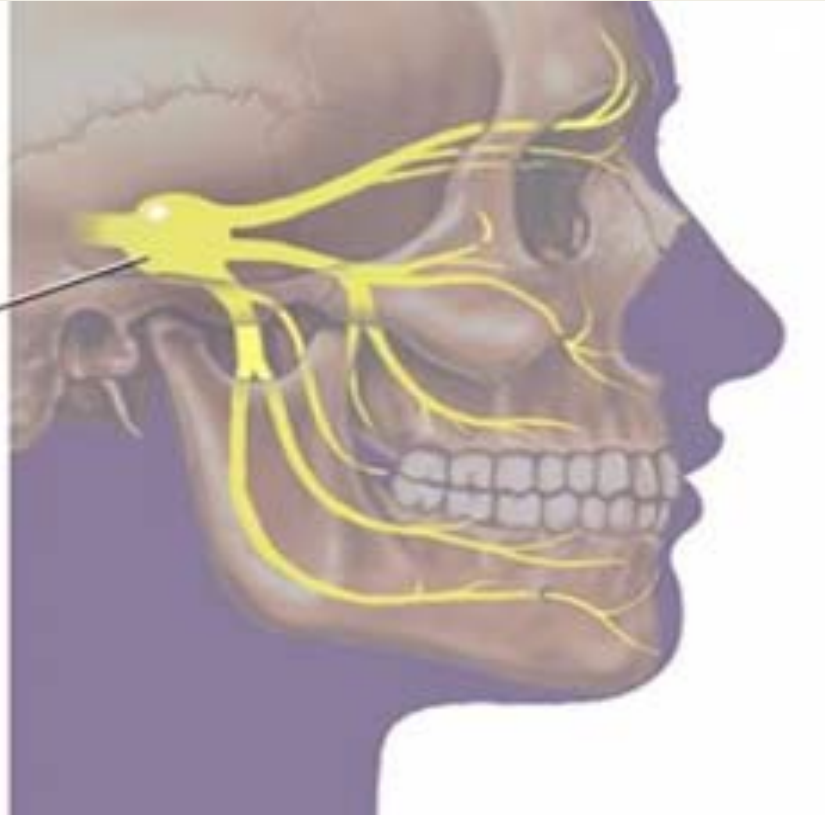


Cranial Nerves for Swallowing:

- CN V - trigeminal
- CN VII - facial
- CN IX - glossopharyngeal
- CN X - vagus
- CN XII - hypoglossal *

CN V

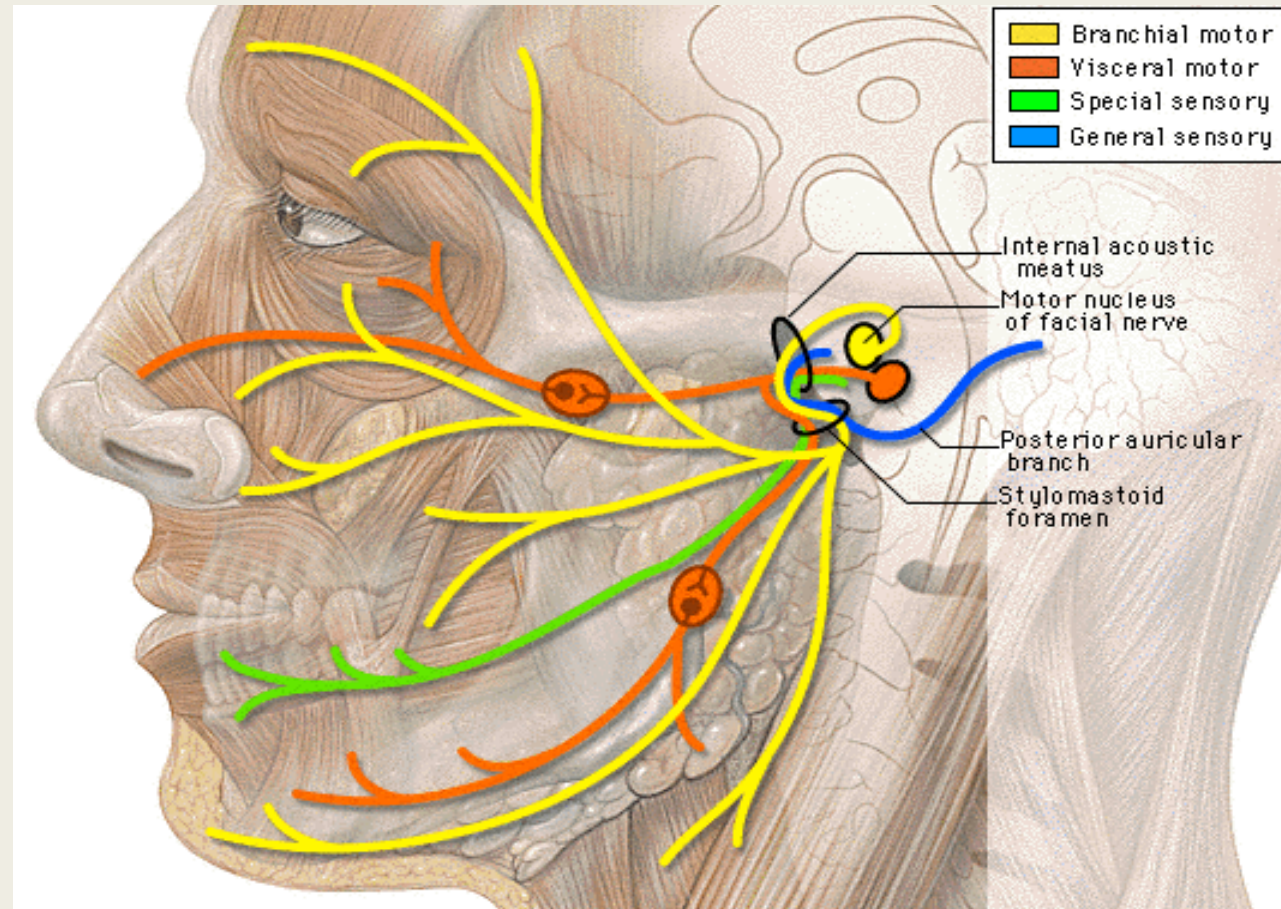
Trigeminal nerve



Motor: mouth opening, mastication (chewing), hyolaryngeal excursion, tensing soft palate, facial expressions

Sensory: sensation ant. 2/3 tongue, pain, sensation to **all** oral mucosa, teeth and gums, salivary flow, temperature sensation hot/cold.

CN VII- facial



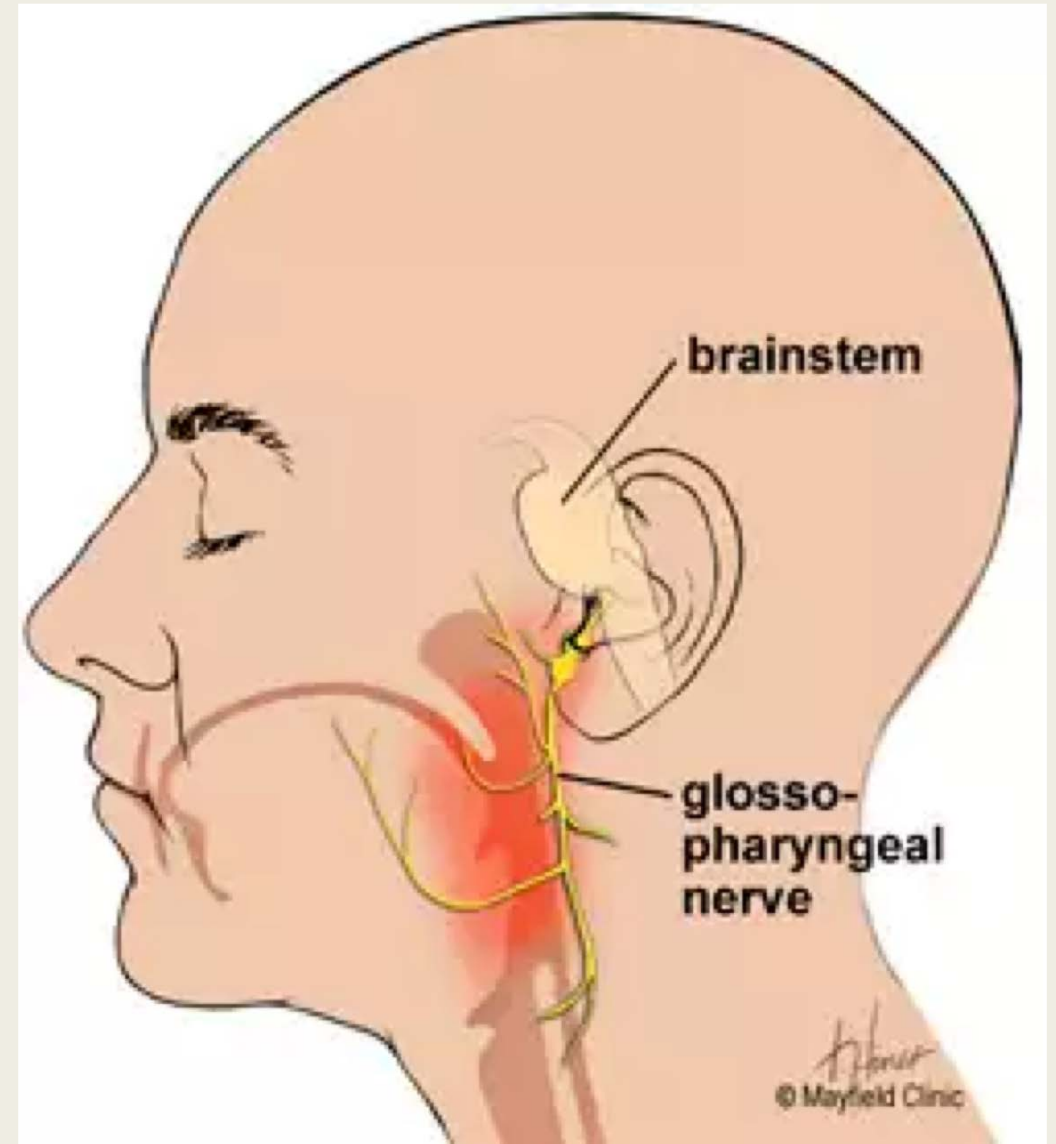
Motor: lip closure, buccal tone, facial expressions, hyolaryngeal excursion

Sensory: taste ant. 2/3, salivation

CN IX- glossopharyngeal

Motor: assist VP closure,
pharyngeal constriction,
hyolaryngeal excursion

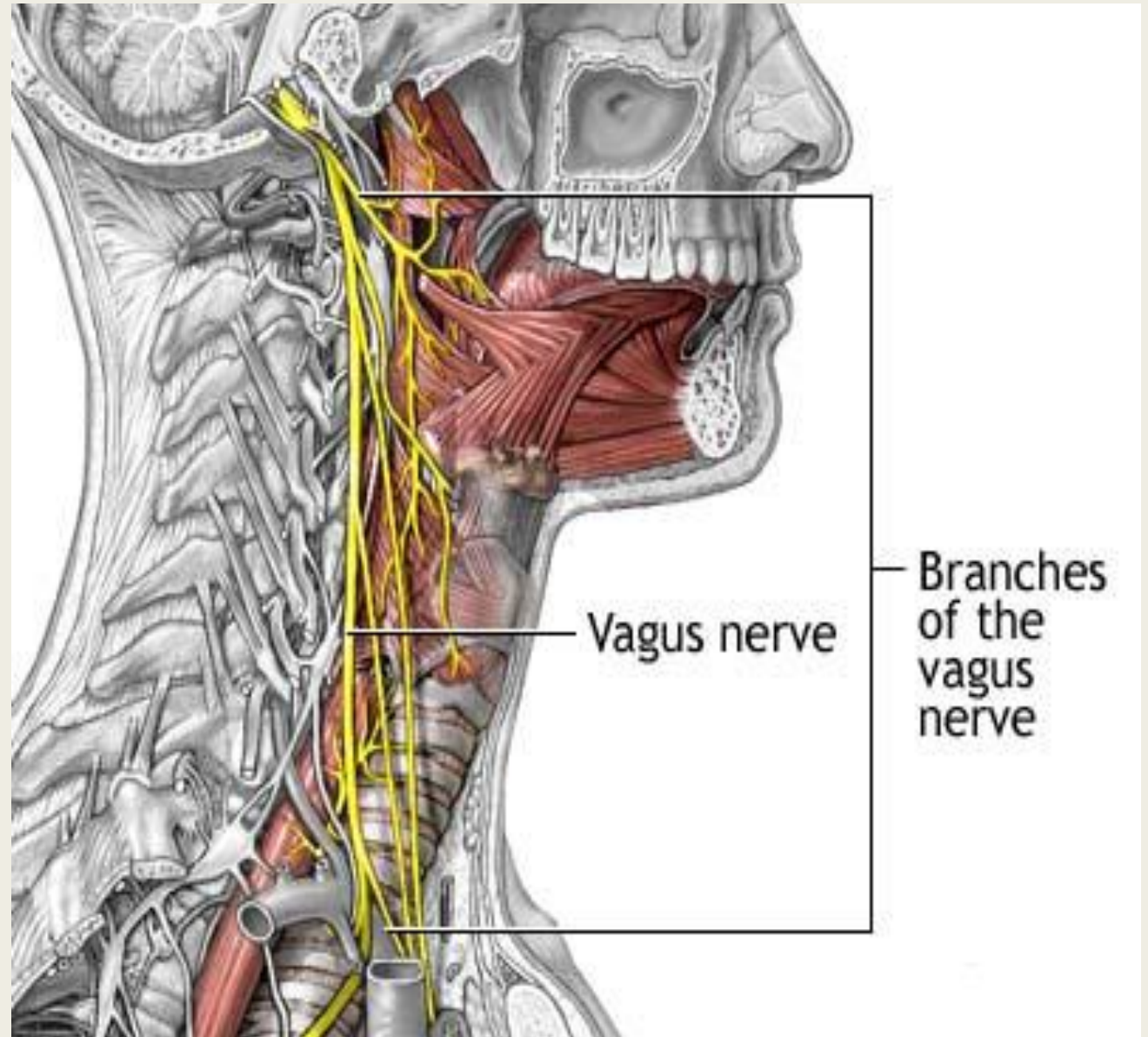
Sensory: taste and sensation-
post. 1/3, salivation, sensation
of soft pal., pal arch, tonsils,
Eustachian, upper pharynx



CN X- vagus

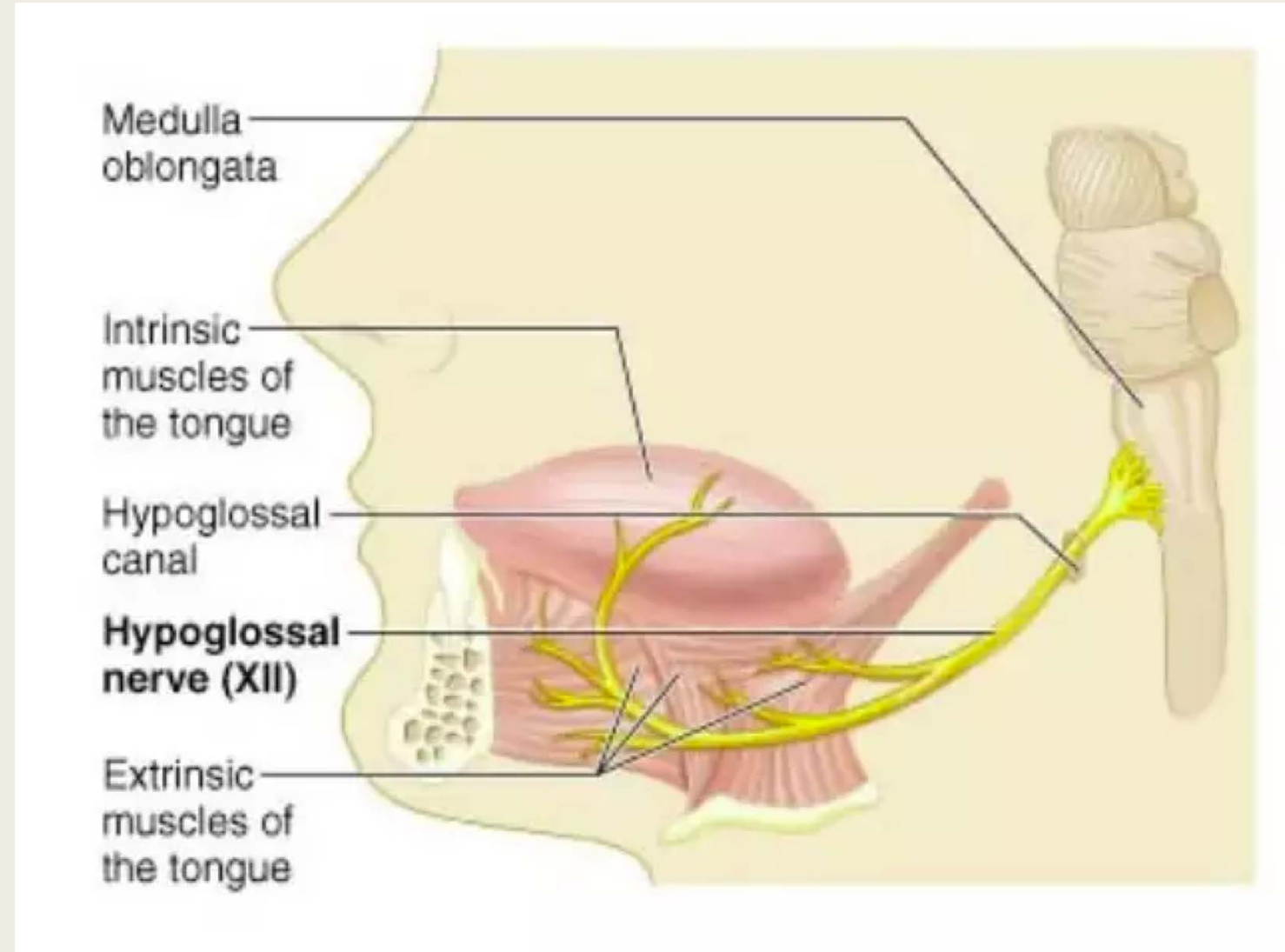
Motor: VP closure, TB retrac., pharyngeal squeeze, airway closure, UES close/open, esoph. motility

Sensory: sensation velum, post. parts of pharynx and all larynx, sensation to abdominal viscera, taste to oropharynx

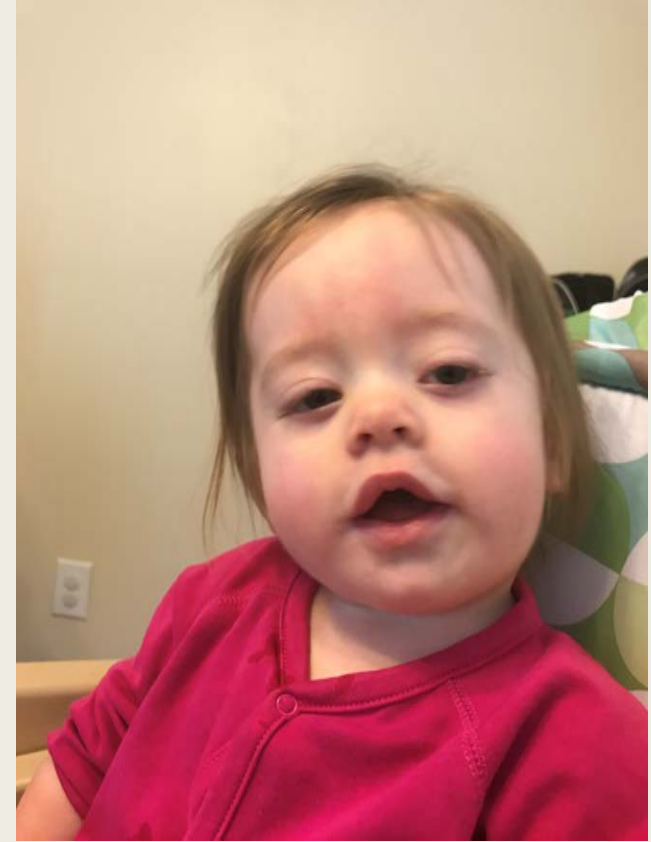


CN XII- hypoglossal

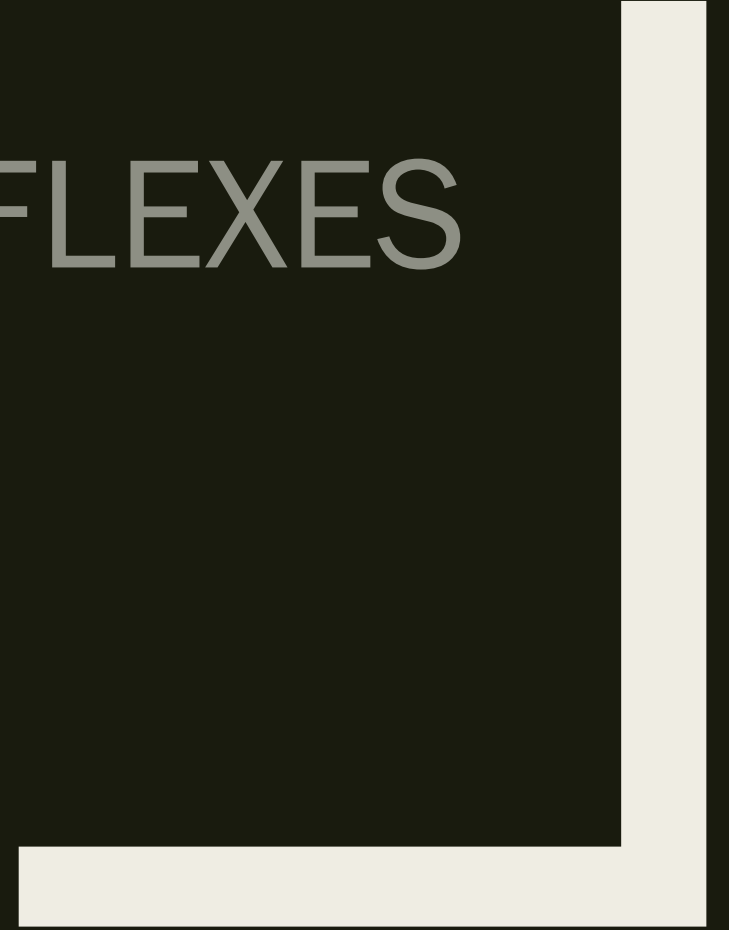
Motor- tongue
mobility



Affected Cranial Nerves



REFLEXES



Infant reflexes involved in swallowing

- Gag
- Phasic bite
- Tongue protrusion
- Transverse Tongue
- Rooting
- Suckling
- Swallowing

Reflex	How to Stimulate	Seems to disappear/ more volitional	Swallowing effect
Rooting Suckling	Touch corner of mouth Put nipple in mouth or stroke tongue tip	1-3 mos. 6-12 mos.	Helps infant find nipple and start to feed
Gag	Touch post. Tongue or pharynx	5-9 mos. Remains in adults	No relationship- but important for safety
Phasic bite	Apply pressure to gums	5-9 mos.	Early munching
Tongue protrusion Transverse Tongue	Touch front of tongue Touch sides of tongue	4-6 mos. 5-9 mos.	Intro. Solids on spoon when disappear
Swallowing	Bolus of food in pharynx	Remains in adults	Food travels safely through pharynx to esophagus

Thought Question

What is interesting about the tongue protrusion reflex and when it disappears?

Answer

tongue protrusion reflex typically disappears between 4 and 6 months of age



<https://babycoutureindia.files.wordpress.com/2015/10/maxresdefault.jpg?w=1408&h=792>



<http://cdn.sheknows.com/articles/2013/11/feeding-baby.jpg>

same time period when we
introduce purees with a spoon



WAYS TO STAY ON THE RIGHT TRACK



a “dance” between baby and feeder





When it is not a dance

When it is not a dance

Cheek and/or
chin support



Oral/Facial Benefits of Proper Breastfeeding

- Helps maintain shape of hard palate
- Balance intraoral and other pressures
- Skin to skin stimulation and muscle activation of both sides of the face, head and body
- Positive effects for later developing feeding skills (study by Silveira, Prade, Ruedell, Haeffner, & Weinmann, 2013)
- Fewer upper and lower respiratory problems
- Fewer digestive problems
- Face, jaw, palate, tooth, and speech development

What else can I do to promote good eating and speech?

- Encourage hand to mouth experiences
 - Generalized mouthing Birth to 4-5 months
 - discriminative mouthing **starts** at 5-6 months
 - mouth play 9 months +

To Pacify



www.toysrus.com

or Thumb suck



<http://godgivenglyphs.com/chirology-articles/thumb-sucking/>

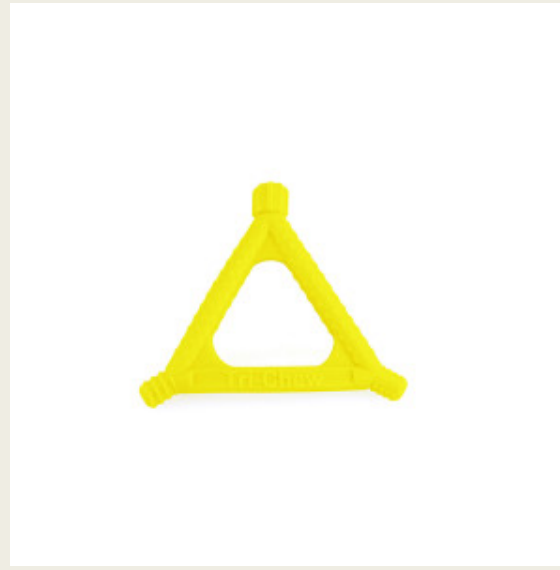
that is the question.....



www.bundoo.com/articles/what-is-an-orthodontic-pacifier/

Weaning guidelines

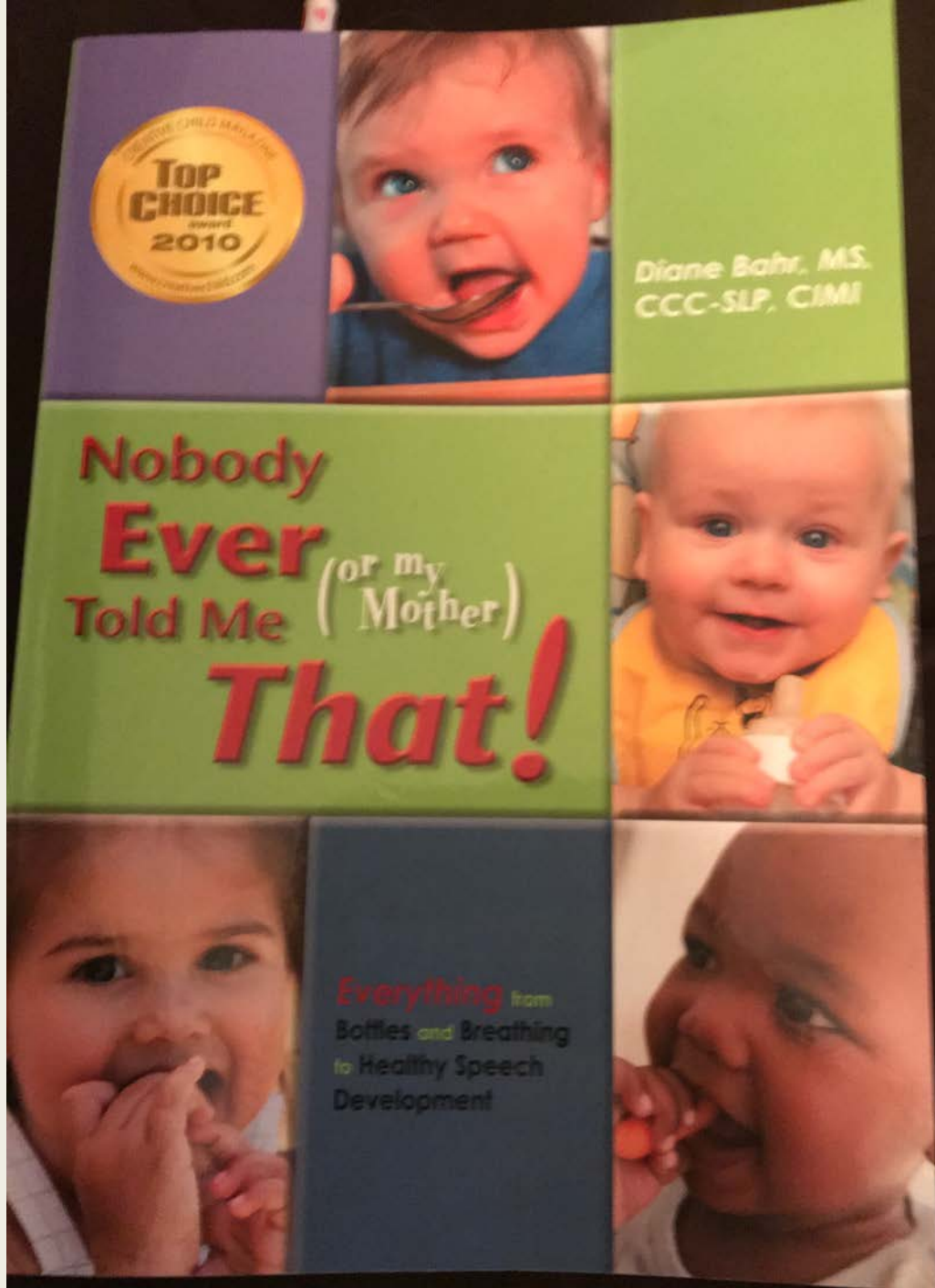
- Begin to wean between 6-10 months
- Introduce appropriate mouthing tools
- Encourage more sophisticated mouthing toys to promote discriminate mouthing



More for the mouth

- Facial and oral message
- Oral stimulation
- Tummy Time
- Timing of food introduction
- Timing of cup and straw drinking





New Book By **Diane Bahr**
coming out in the spring:
“Feed Your Baby and
Toddler Right”

Melanie Potock, SLP

Two online courses:

1)The Picky Eater Course

Available in March:

2) Pediatric Nutrition for
Parents and Professionals.

sign up for newsletter at
www.melaniepotock.com, I'll
send everyone a 50% off code
and they can take the course
for about \$10 to \$15 at most!

Mymunchbug.com

Please feel free to email me with questions



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