Feeding in the Newborn: Atypical Breast feeding and Bottle feeding

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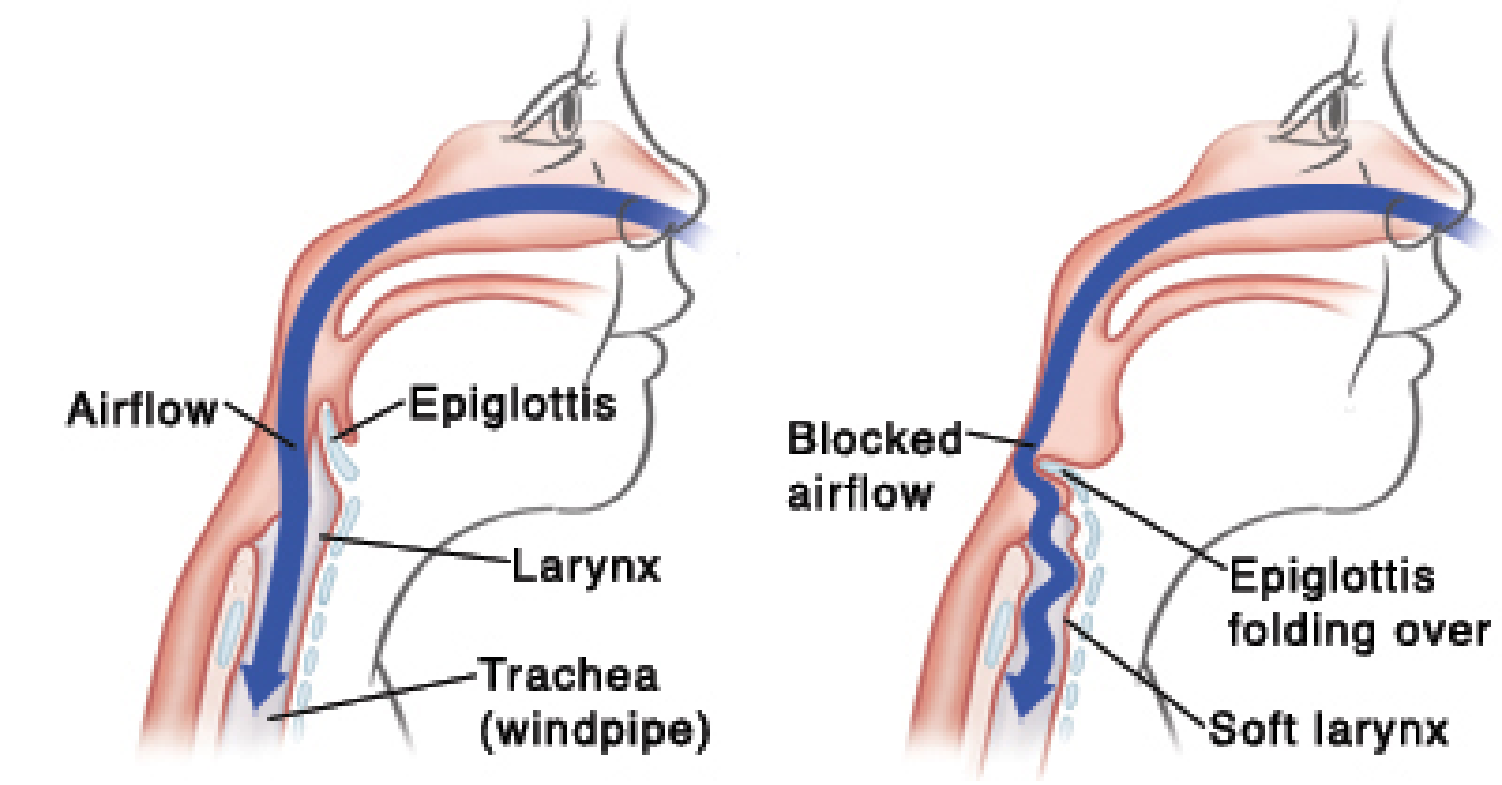
Feeding and Special Conditions

- Airway Abnormalities
- Congenital Heart Disease
- Dysphagia and Aspiration
- Feeding in the infant with Low Tone
- Feeding in the infant with Cleft lip and palate

Airway Abnormalities

- Pharyngomalacia
- Laryngomalacia
- Tracheomalacia
- Vocal cord paresis
- Pierre Robin Sequence

Laryngomalacia



Laryngomalacia

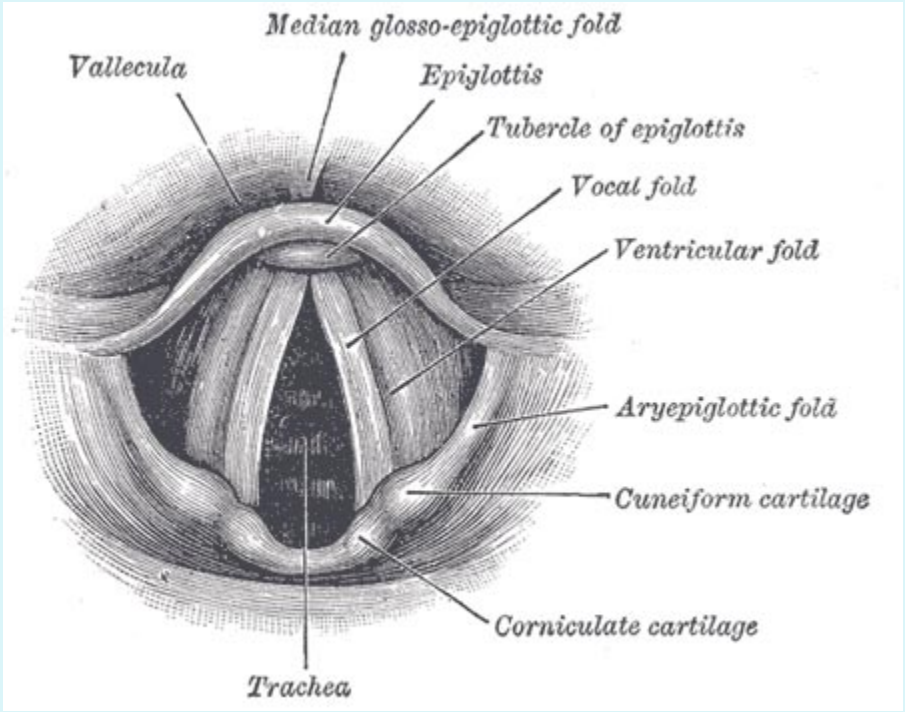
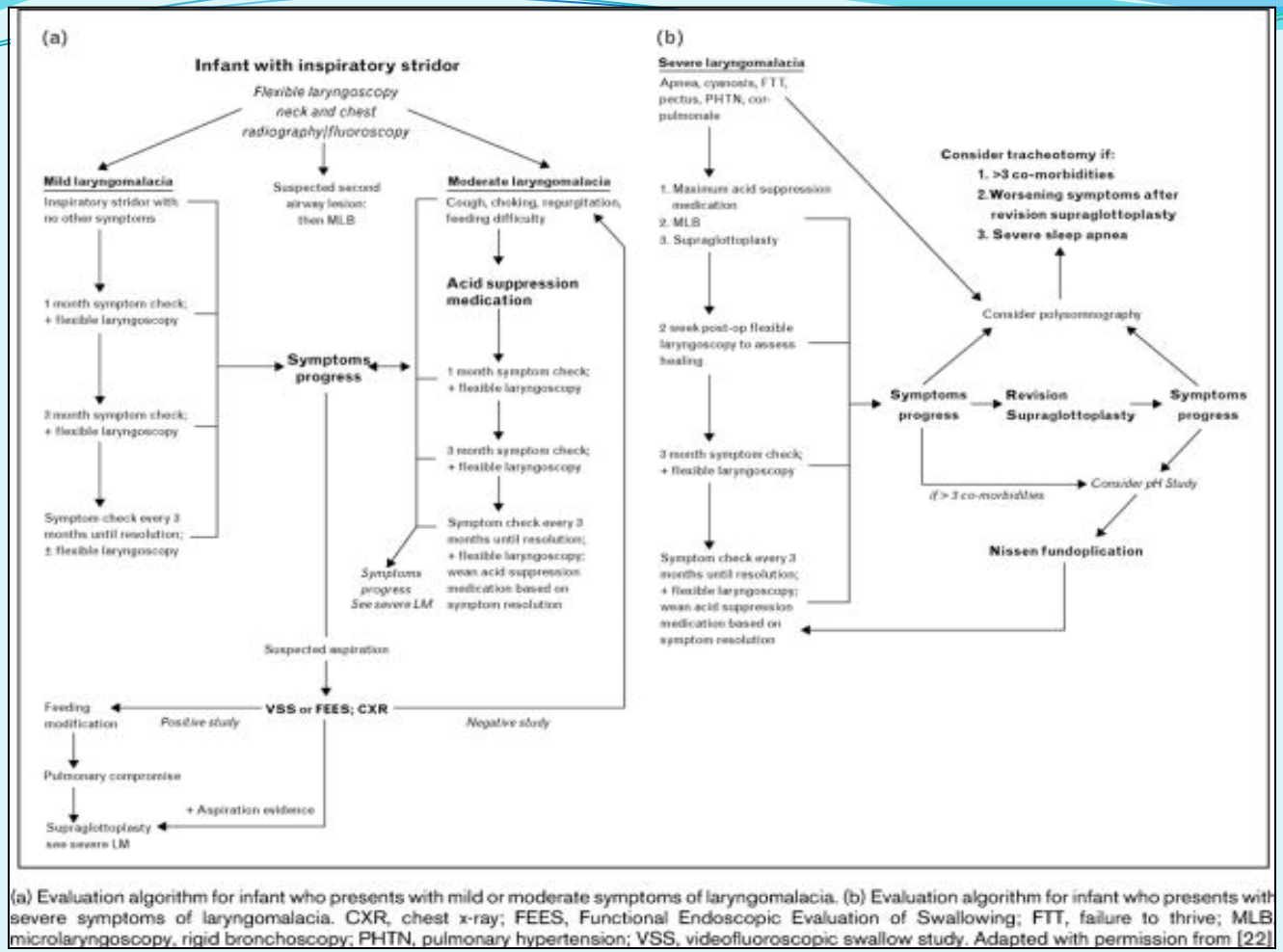


Figure 1



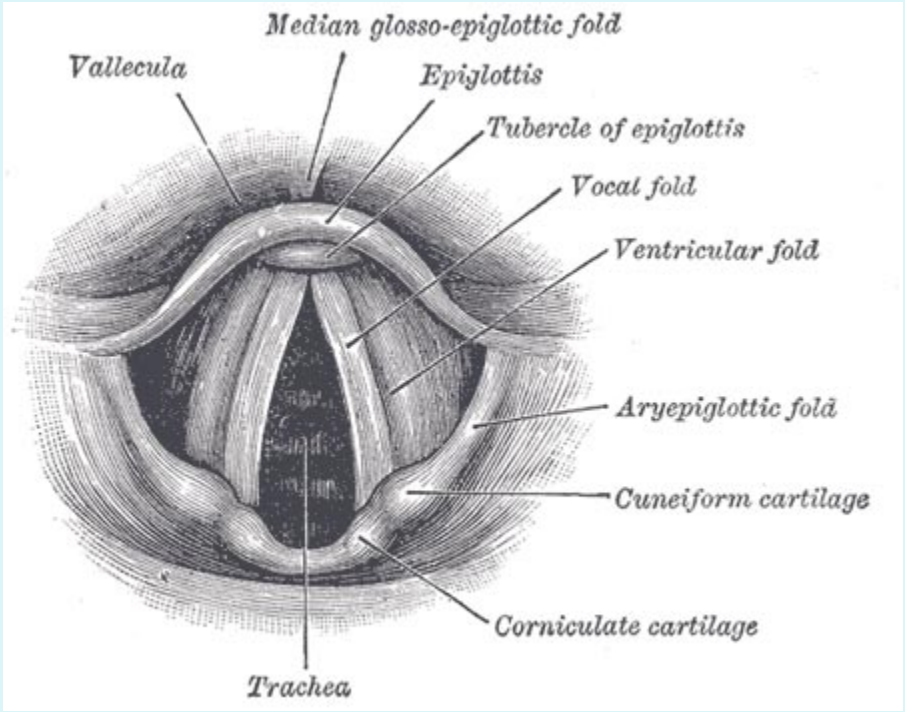
(a) Evaluation algorithm for infant who presents with mild or moderate symptoms of laryngomalacia. (b) Evaluation algorithm for infant who presents with severe symptoms of laryngomalacia. CXR, chest x-ray; FEES, Functional Endoscopic Evaluation of Swallowing; FTT, failure to thrive; MLB microlaryngoscopy, rigid bronchoscopy; PHTN, pulmonary hypertension; VSS, videofluoroscopic swallow study. Adapted with permission from [22]

Figure 1 Evaluation algorithm for an infant with laryngomalacia

Laryngomalacia: factors that influence disease severity and outcomes of management.
Thompson, Dana

Current Opinion in Otolaryngology & Head & Neck Surgery. 18(6):564-570, December 2010.
DOI: 10.1097/MOO.0b013e3283405e48

Laryngomalacia



Pierre Robin Sequence

- Micrognathia
- Tongue Retraction (relative glossoptosis)
- U shaped-Cleft palate
- Developmental anomalies leading to upper airway obstruction, feeding dysfunction, desaturation, gastroesophageal reflux and conductive hearing loss.


HOLIDAY GIFT GUIDE NOV/DEC 2009
Special Needs
Parenting
"Real Life" Gifts
SAFE PLAY Tips
Healthy Holiday RECIPES
Budget Friendly Gifts

Tracheostomy and Swallowing

- Reports of swallowing dysfunction in children having a tracheostomy have been as high as 91%, with half due to neurological or anatomic defects.

Rosingh H,Peek S, *Acta Otorhinolaryngol Belg* 1999

Tracheostomy and Swallowing

- Multiple problems may be associated with the inability to feed.
- Orosensory aversion
- Oral phase problems
- Pharyngeal phase problems
- Respiratory problems

Tracheostomy and Swallowing

- Having a tracheostomy will affect the pharyngeal phase of the swallow.
- 4 toddlers with tracheostomies
  - 14mo-33mo.
  - VFES compared to a single control
  - Onset times for pharyngeal events
  - Onset of laryngeal vestibule closure
  - Tracheostomy tube movement
  - Swallow response initiation
  - Pharyngeal transport function

Abraham S,Wolf E, *Dysphagia* 2000

Tracheostomy and Swallowing

- In the children with tracheostomies the laryngeal vestibule closed after the upper esophageal sphincter opened.
- The time required to close the laryngeal vestibule was longer and was associated with penetration.
- Delayed swallow response initiation was seen in 45% of the swallows , more likely with liquid.

Abraham S,Wolf E, *Dysphagia* 2000

Airway Abnormalities and Feeding

- Shallow breathing
- Need for oxygen
- Inefficient feeding
- Cough and or choking
- Aspiration

Help Spread
CHD
Awareness

Feeding and Special Conditions

- Airway Abnormalities
- ***Congenital Heart Disease***
- Dysphagia and Aspiration
- Feeding in the infant with Low Tone
- Feeding in the infant with Cleft lip and palate

Congenital Heart Disease and Feeding

- Fatigue or tachypnea
- Sweating
- Color changes
- Inefficiency
- Need for more calories in those with cyanotic congenital heart disease

Feeding and Special Conditions

- Airway Abnormalities
- Congenital Heart Disease
- ***Dysphagia and Aspiration***
- Feeding in the infant with Low Tone
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Physical Exam and Feeding

- Airway and Breathing
- Color and alertness
- Head and neck exam
- Chest and heart exam
- Abdomen exam
- Neurological exam

How do we observe a Feeding?

We will watch the infant's:

- Suck
- Swallow
- Breathe
- Efficiency
- Sufficiency

How do we watch sucking in the infant?

- Rate (Burst/Pause)
- Rhythm of the such-swallow-breathe
- The mature burst of sucking is 8-10
- The tongue and the jaw move together

How do we watch Swallowing?

- We can listen to the swallow
- We can see signs of problems with swallowing:
  - Nasopharyngeal Reflux
  - Cough
  - Choking
  - Sounds of pooled liquid

How do we watch Breathing?

- Rate (Apnea and Tachypnea)
- Rhythm (Regular vs. Irregular)
- Color (duskiness around the mouth)
- Oxygenation level with a saturation monitor
- Signs of Distress: cough, increased chest wall motion, “rattley sound”, wheezing

How do we measure Efficiency?

- Watching the bottle empty
- Watching for lost liquid around the mouth
- Determining how long the feeding takes
- Watching for signs of respiratory problems when feeding

How do we measure Sufficiency?

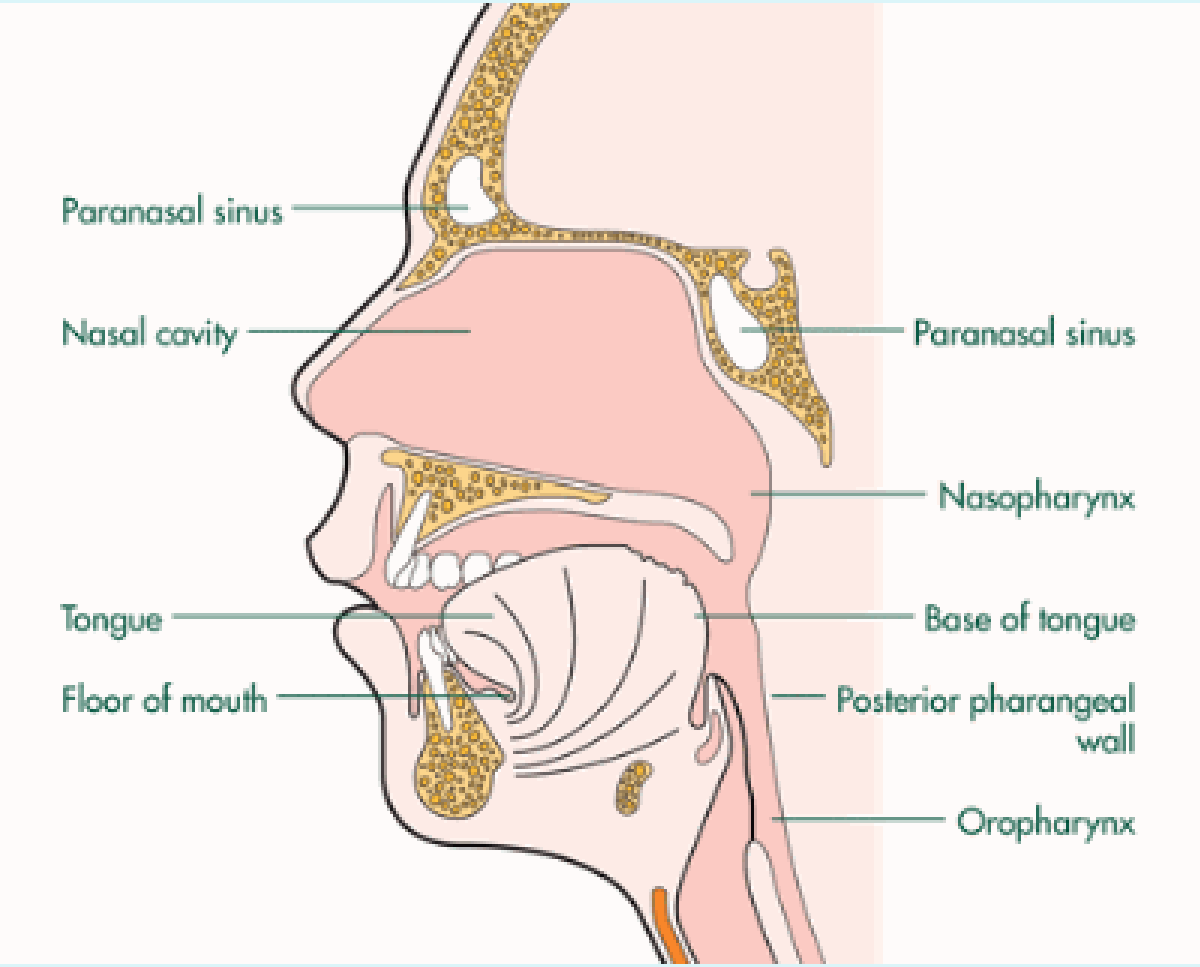
- Review the growth measurements on the appropriate NCHS Gender Specific Grid
- Can the infant eat often enough to take in the needed nutrition?
- Determine the intake needs of the infant:
  - 100ml/kg per day (24hours)
  - 110 kcal/kg per day (24 hours)

Diagnosis of Dysphasia

- Physical Examination:
  - Anatomy, tone, head control, oral reflexes
- Observation of Feeding:
  - Head position; jaw, tongue, movements
  - Rate, rhythm, efficiency of feeding
  - Symptoms of dysphagia

Symptoms of Dysphagia

- Generalized
  - Decreased Feeding Efficiency
  - Difficulty Feeding
  - Failure-to-Thrive
  - Food Refusal
  - Reactive Airway Disease
  - Recurrent upper respiratory sx


Paranasal sinus
Nasal cavity
Paranasal sinus
Nasopharynx
Tongue
Base of tongue
Floor of mouth
Posterior pharangeal wall
Oropharynx

Symptoms of Dysphagia

- Oral Phase
  - Oromotor Dysfunction
  - Weak Suck
  - Tongue Thrust
  - Tonic bite reflex
  - Choking
  - Gagging
  - Drooling

Symptoms of Dysphagia

- Esophageal Phase
  - GER
  - Gurgling sounds without feeding
  - Desaturation with feeding
  - Cough

Symptoms of Dysphagia

- Pharyngeal Phase
  - Gagging
  - Choking
  - Cough
  - Nasopharyngeal Reflux
  - Desaturation with feeding

Diagnosis of Dysphagia

- MRI
  - Chiari I & ll Malformations
  - Medullary Infarcts (adults)
  - No series of evaluative MRI in children
  - Functional MRI studies are being explored
- Gastroesophageal Reflux Evaluation

Pediatric dysphagia

- There are diverse pathologies with mixed origins
- Classifying schemes vary
- Burklow et al proposed a schema of grouping origins of pediatric dysphagia
  - Structural
  - Neurologic
  - Metabolic
  - Cardio respiratory
  - Behavioral

Pseudobulbar Palsy

- A clinical syndrome caused by interruption of the corticobulbar fibers to the motor nuclei of the cranial nerves.
- Weakness of the muscles supplied by these nuclei.

Afifi AK, Bergman, Ral Functional Neuroanatomaly McGraw-Hill 1998 ISBN 0-07-001589-0

Diagnosis of Aspiration

- Aspiration is the passage of liquid/solids into the airway during feeding.
- May or may not see cough
- May not see pneumonia
- May see chronic respiratory symptoms
- May or may not see desaturation
- Video fluoroscopic Evaluation of Swallow (VFES)
- Fiber optic Endoscopic Evaluation of Swallow (FEES)

Diagnosis of Aspiration

- Video fluoroscopy (VFES)
  - Still test of choice
  - Done in the upright position under typical feeding conditions
  - Uses a variety of textures
  - Easily involves the parent

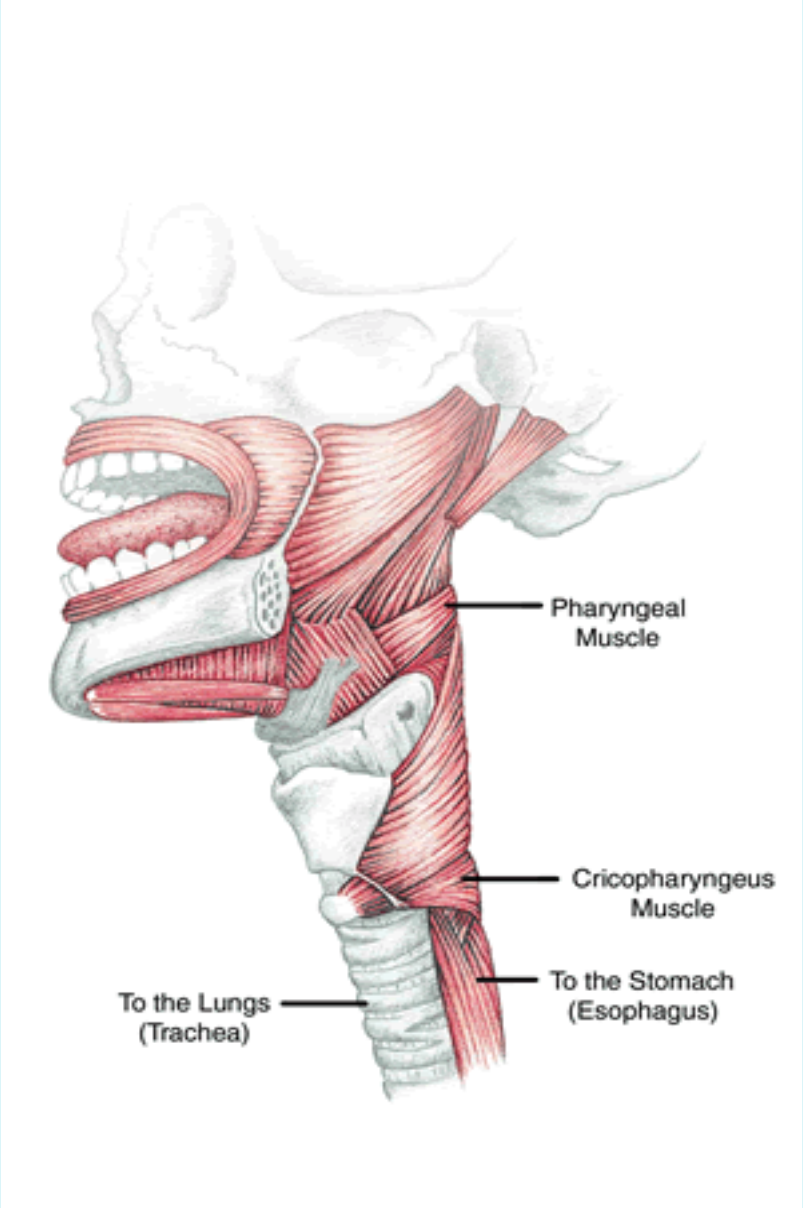

PHILIPS
RILEY X-RAY

Anthony, 10th suck

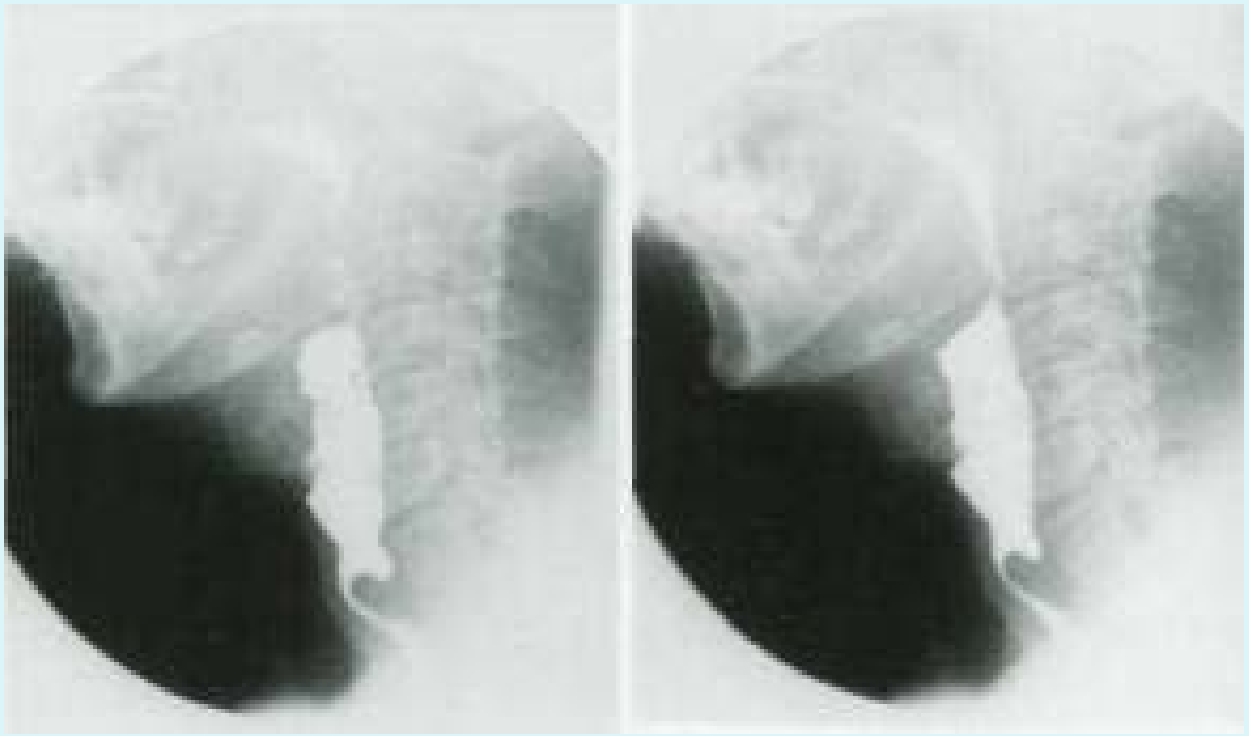
Diagnosis of Aspiration

- Interpretation of Videofluoroscopic Studies
  - Laryngeal Pooling
  - Aspiration is frequently silent
  - Deep Laryngeal Penetration is associated with aspiration
  - Nasopharyngeal reflux
  - Cricopharyngeous stricture

Crychopharyngeus dysfunction



Crychopharyngeal dysfunction



Diagnosis of Dysphasia

- Fiber optic Endoscopy
- An endoscope is passed into the nasopharynx for direct visualization of the swallow
  - Dye is used to increase visualization
  - Less well tolerated by children and parents
  - Limited studies
  - Visualizes anatomic defects
  - Observe GER related erythema in the tissues

Diagnosis of Dysphagia

- MRI
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  - No series of evaluative MRI in children
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Pediatric Dysphagia

- Once diagnosed, treatment techniques center on:
- Assuring feeds are *safe* and not aspirated or respiration is compromised
- Enabling the infant to be as *efficient* as possible,
- Guaranteeing *sufficient* intake for growth

What do we do to help feeding?

- Posture and Positioning for feeding
- Adapt Nipples and Bottles or cups
- Change the thickness of the liquid
- Adjust timing and # of feedings
- Advise about volume needed
- Adjust caloric density of foods/beverages
- Supplement feedings

Posture and Positioning for Feeding

- Good positioning is one of the most important things we can do to help the baby
- Support the head: keep their head quiet
- Upright Trunk position: maintain the best neck and chest position for swallowing and breathing
- “Nose to Navel” : align the head in midline

Supplementation of Oral Feeding

- Two reasons to supplement oral feedings with tube feedings:
  - The infant cannot consume enough
  - The infant aspirates feedings

Supplementation of Oral Feedings

- Supplemental feedings should be used for as short a time as possible: until the infant can safely and easily take adequate intake for good growth.
- Nasogastric feedings
- Gastrostomy feedings

Common Feeding Characteristics in Infants with Low Muscle Tone

- Weaker suck
- Shorter burst-pause pattern
- Long pauses
- Less efficiency in getting liquid
- More loss of liquid
- Matures slowly

Feeding Plan

- Know the infant's skills
- Match the feedings with the skill level not the age
- Adapt nipple-bottle
- Adapt the thickness of the liquid
- Adjust caloric density of food/liquid
- Advise about intake goals
- Ensure adequate # of feedings

Katelyn

- Katelyn was born with a cleft lip and a cleft palate.
- She was evaluated by the Craniofacial team and evaluated for feeding.
- An obturator was made because she has a cleft of the lip and gum on the left side.

Initial Steps to Better Feeding

- Positioning
  - Midline position
  - Slightly tipped chin
  - Elongated neck
  - Support the head and neck with your hand
  - Face forward

Initial Steps to Better Feeding

- Timing Feeds
- Wake to feed
- Be consistent

A Feeding Plan

- Who will feed
- What to feed
- When to feed
- Where will the feeding take place
- How much will be fed
- How long will the feeding last

A Feeding Plan Example

- Who: Mom and Dad
- What: 24 cal. Formula with iron
- When: Every 3 hours
- Where: Being held with head and chin support
- How much: 3 oz.
- How long: 30 Min. and supplement the remainder

In Conclusion

- Evaluate the motor skills of the infant
- Evaluate the oromotor skills of the infant
- Determine the level of development
- Develop a plan for feeding to help the infant be successful, yet advance in feeding goals.
- Team members can work together for adequate growth, nutrition, and assessment of safety.