Communication and Swallowing Disorders

Objectives:

- Understand physiology of communication.
- Recall different categories of communication and swallowing disorders.
- Differentiate different causes of communication and swallowing disorders.
- Assess and manage different communication and swallowing disorders.

[Color index : Important | Notes | Extra]

Resources: Slides+434 team+Notes.
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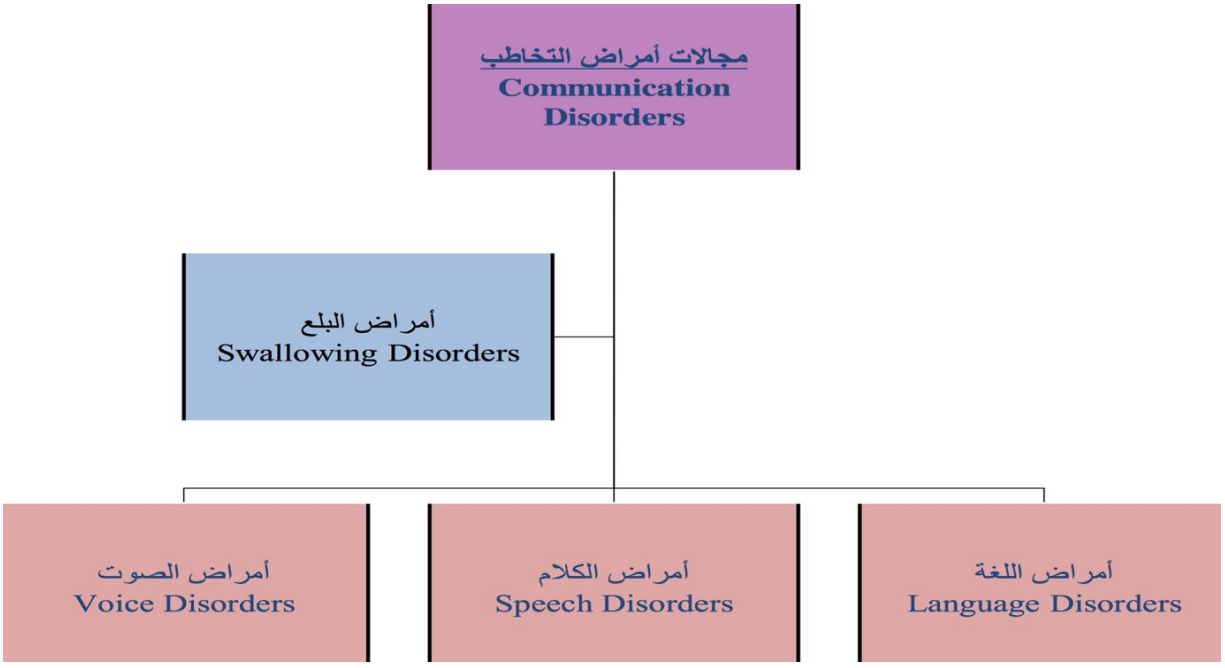
DEFINITIONS

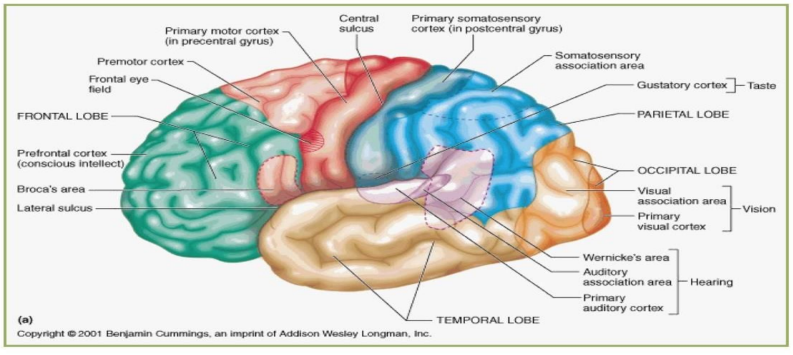
Language	• A symbolic arbitrary system relating sounds to meaning.
Speech	• A neuro-muscular process whereby language is uttered تلفظ • It includes the coordination of respiration, phonation, articulation, resonation and prosody.
Voice	• The result of vibration of the true vocal folds using the expired air.
Swallowing	• The process of successful passage of food and drinks from the mouth through pharynx and esophagus into the stomach.

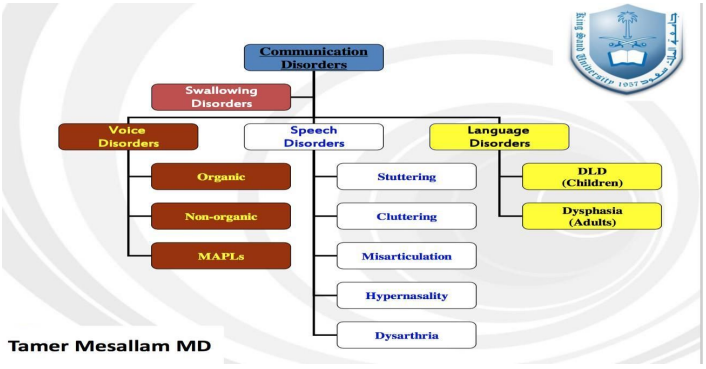


Brief information about the neurophysiology of communication and swallowing

EXTRA(not mentioned in doctor's slides):

Language	-The major area of language comprehension called Wernicke's area: 1. This area lies behind the primary auditory cortex in the posterior part of the superior gyrus of the temporal lobe. (problem will cause fluent aphasia but have no meaning) 2. The visual association area that feeds visual information conveyed by words read from a book into Wernicke's area is the language comprehension area "angular gyrus area", lying in the anterolateral region of the occipital lobe.
Speech	Prosody is the ability to change the tone while speaking=> lost in Parkinson disease= (1 tone speech) -Broca's area (problem will cause expressive aphasia understand but can't express), located partly in the cortex and partly in the premotor area, is responsible for expressing individual's words and short phrases. It works in association with Wernicke's area.
Voice	• Voiced sound: The basic sound produced by vocal fold vibration is called "voiced sound". This is frequently described as a "buzzy" sound. • Voiced sound for singing differs significantly from voiced sound for speech. • Resonance: Voice sound is amplified and modified by the vocal tract resonators (the throat, mouth cavity, and nasal passages). • The resonators produce a person's recognizable voice. • Articulation: The vocal tract articulators (the tongue, soft palate, and lips) modify the voiced sound. • The articulators produce recognizable words.





1- Language Disorders

Disorders of communication

- Central language control
    - The left hemisphere is the processor of language functions in almost all people regardless handedness. It is the dominant hemisphere.
    - Language areas are distributed along the rolandic fissure. (central fissure)

1. Anterior language area mainly in the temporal region concerned with expressive aspect. (Broca's)
2. Posterior language area mainly in the parietal region concerned with receptive aspect. (Wernicke's)

- the baby will say his first word at 1st year age (9 months – 1yr).
- and at 3rd year he should be able to say more than 1 word sentence if not he may have DLD (delayed language development).
- A parent with a baby who speaks no more than 2 word at age of 2 should seek advice.

❖ Delayed Language Development (DLD)

➔ **Definition**: Delay or failure to acquire language matched with age. Ex. 4 yr old child who knows 4 words only!

★ Pre-requisites of normal language development:

- Intact brain functions (conceptual, motoric and cognitive abilities).
- Intact sensory channels; Auditory, Visual, Tactile, Kinesthetic.
- Intact psyche.
- Stimulating environment.

➔ **Etiology** (opposite of pre- requisites)

1. **Brain damage.**
   - Diffuse subcortical lesion (M.R.).
   - Localized brain damage with motor handicap (BDMH).
   - Minimal brain damage (ADHD),medication then speech therapy.
2. **Sensory deprivation.**
   - Hearing impairment: Conductive, Sensory-neural , Mixed , Central auditory processing disorder.
   - Visual impairment.
3. **Psychiatric illness:** Autism. , Autism Spectrum Disorder (ASD).
4. **Environmental deprivation**: Lonely child
5. **Idiopathic**. Specific Language Impairment (best prognosis) .

➔ **Assessment of DLD:**

1. **History taking.**
2. **Physical Examination.**
3. **Investigations:**
   a. Psychometry (IQ).
   b. Audiometry. EEG.
   c. Brian Imaging.
   d. Ophthalmological consultation.

➔ **Management:**

- Early detection. late=> worse prognosis.
- Providing the suitable aid: Hearing (HA or CI), Visual Aid, Physiotherapy.
- Family counseling. encourage them to speak to him.
- Direct language therapy (Individual- group). Medications (Autism and ADHD).

❖ Dysphasia

➔ **Definition**: Language deterioration after its full development due to brain insult: infarction, hemorrhage, atrophy, etc.

★ **Types of dysphasia:**

1.Expressive: (e.g. broca's aphasia) Understands but cannot speak, very traumatic psychologically. (better prognosis)

2. Receptive: Can speak but he doesn't understand

3.Mixed predominantly expressive.

4.Mixed Predominantly Receptive.

5.Global.

➔ **Etiology:** CVA / Neoplastic / Traumatic /Inflammatory / Degenerative / Metabolic / Poisoning.

★ **Examples:**

1.Expressive:

Dr: Where's your son?
Pt: Points to his son
Dr: Ok, What's his name?
Pt:..... (unable to answer to a direct Q)

2.Receptive:

Dr: How R U today?
Pt: oh, yes I slept well yesterday...

➔ **assessment of Dysphasia:**

1. History taking.
2. Physical examination: neurological exam.
3. Investigations:
    a. CT / MRI brain.
    b. Dysphasia test.
    c. Psychometry (IQ).
    d. Audiometry.

➔ **Management:**

- Treat the cause.
- Physical rehabilitation (Physiotherapy).
- Family counseling.
- Language therapy.Alternative and augmentative communication:
- Cards, sign boards,

2- Speech Disorders:

Dyslalia (Misarticulation) لدغة

Definition: Faulty articulation of one or more of speech sounds not appropriate for age.

Types:

- Sigmatism (/s/ defect):
  - Interdental stigmatism ثبورة
  - Lateral astigmatism شبورة
  - Pharyngeal sigmatism.
- Back-to-front dyslalia كورة :
  - /k/ =/t/.
  - /g/ =/d/ تورة
- Rotacism (/r/ defect): ☺ ييما=ويما=غيما:ريما
- Voiced-to-nonvoiced dyslalia: /g/ /k/- /d//t/ -/zs/etc...

Assessment of DLD:

1. History taking.
2. Physical examination.
3. Investigations:
   - Audio recording.
   - Audiometry.
   - Articulation test.
   - Psychometry (IQ).

Management:

1.Treatment of the cause:

- Tongue tie (prevents elevation of the tongue (can't say La).
- Dental anomalies (open bite).
- Hearing aids

2.Speech therapy with assistance and counseling.

Stuttering تأتأة

Definition: The intra phonemic disruptions resulting in sound ككككورة ,and syllable repetitions كووورة ,sound prolongations and blocks. Worst prognosis

Type :

- prolongation/ repetitions/blocking

Normal disfluency : 3-6 years. Only repetitions. No associated muscular activity. Not aware.

Incidence of stuttering: 1%.

Onset:

- Earliest = 18 months. Latest = 13 years.

Epidemiology:

- More in families with history of stuttering.
- Can occur in mentally retarded.
- Very rare in the hearing impaired.

Gender ratio:

- 4 : 1 (male : female) , worst in females.

Theories of Stuttering:The exact cause is unknown.

✓ Organic theory (doctor goes with organic more).
✓ Neurosis theory.
✓ Learning theory.

Assessment of Dysphasia:

1. History taking.

2.Physical examination

3.Investigations:

- Audio & video recording.
- Stuttering severity.
- Psychometry (IQ).
- Articulation test.
- Auditory Perceptual Analysis (APA).

Management:

- Family and patient counseling.
- Speech therapy:

a. Indirect therapy: if not aware. on the family side (slowing their talk).
b. Direct therapy: if aware.

- **Auditory Perceptual Analysis (APA)**

A. Core behaviors:

Intraphonemic disruption.
Repetitions.
Prolongations.
Blocks.

B. Secondary reactions

- Muscular activity and struggle. – Interjection - Word substitutions and circumlocution. C.

Concomitant reactions:

Fear.
Eye contact.
Skin pallor/flushing
Breathing (antagonism, interruption, prolongation, cessation, ...)

3. cluttering : التبعثر

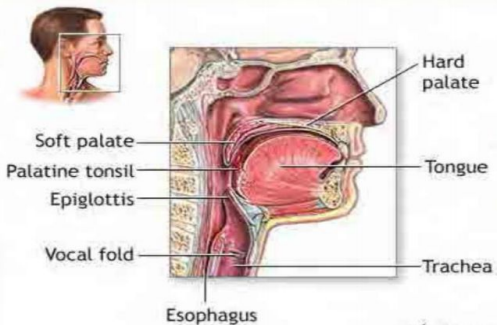
is a fluency disorder characterized by a rapid and/or irregular speaking rate, excessive disfluencies.

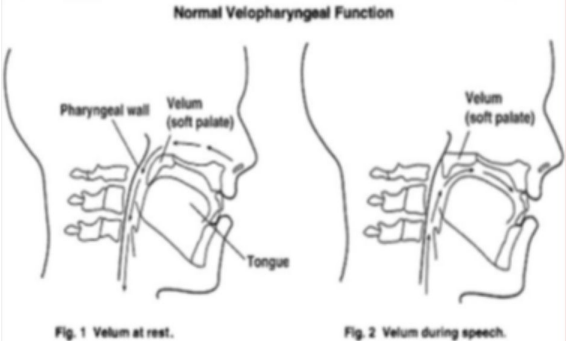
4. Hypernasality:

❖ **Definition:**

➢ Faulty contamination of the speech signal by the addition of nasal noise. It results from velopharyngeal dysfunction (VPD) or insufficiency (VPI) .

- All of us have nasal tone, we use it in M+N, however it doesn't exceed the limits.
- Hyponasality => close type=> Flu, Adenoid (more common).
- Hypernasality => open type=> velopharyngeal dysfunction (VPD).
- We're concerned with soft palate(velum) which separates the nasal cavity from the mouth.





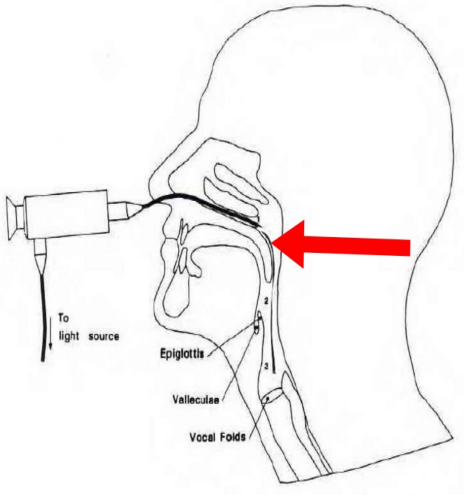
is a disorder that causes abnormal resonance in a human's voice due to increased airflow through the nose during speech.

❖ Etiology:

Organic	Non-organic
1. Structural **a. Congenital:** ● Overt cleft palate. ● Submucous cleft palate. ● Non-cleft causes: ○ Congenital short palate. ○ Congenital deep pharynx. **b. Acquired:** Adenotonsillectomy. 2-4 weeks => temporary (pain=> decrease movement=> more inx are needed if it exceeds 4 weeks> surgical error **2. Neurogenic:** (VP Incompetence) Palatal U motor neuron lesion/ Palatal L motor neuron lesion.	● Faulty speech habits. ● Mental retardation. ● Hearing impairment. ● post- tonsillectomy pain.

➢ Effects of VPD:

- Feeding problems: nasal regurgitation.
- Psychosocial problems.
- Communicative problems:
  - Speech: hypernasality.
  - Language: DLD.
  - Voice: hyper or hypofunction.
  - Pic is showing a flexible Nasopharyngolaryngoscopy.



➢ Assessment of hypernasality (VPD)

- Parent interview.
- Perceptual.

- Simple tests:
  - Gutzman's (a/i) test.
  - Czermak's (cold mirror) test:
  - Resonance, Articulation, Nasal air emission, Voice. (no consideration while talking).

- Instrumental:
  - Nasopharyngoscopy.
  - Nasometry = How much nasality u have?.
  - Fiberoptic nasopharyngolaryngoscopy.

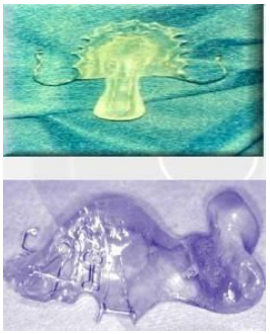
➢ Management:

- Multidisciplinary team.
- Management of feeding problem.
- Palatal and lip surgeries.
- Obturators.
- Communication :(language, speech, voice)
- Maxillofacial.

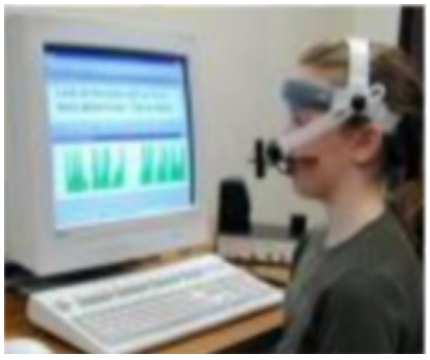
- **Treatment Decision:**
    - **Velopharyngeal insufficiency:** surgery (speech therapy post-op).
    - **Velopharyngeal incompetence:** surgery (speech therapy post-op) / prosthetic devices / speech therapy.
    - **Velopharyngeal mislearning:** speech therapy.

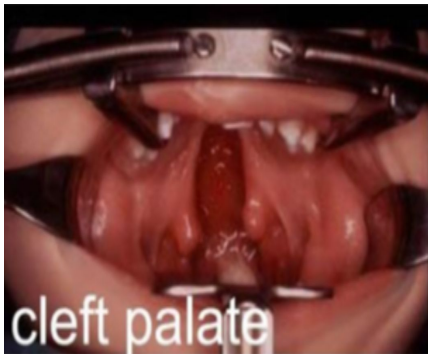
- **Surgery**
    - Pharyngeal flap / sphincter- palatoplasty / post-pharyngeal wall augmentation.

- **Prosthetic device**
    - Palatal lift: to raise the velum when there is poor velar movement (i.e. dysarthria).
    - palatal obturator: to occlude an open clef or fistula.
    - speech bulb: to occlude nasopharynx.

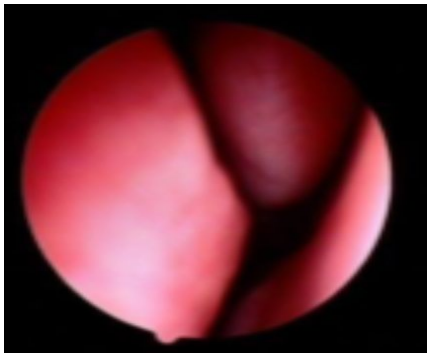


Naometry

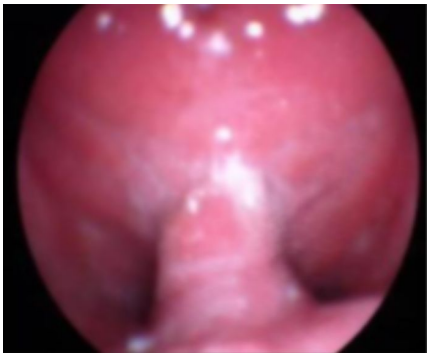




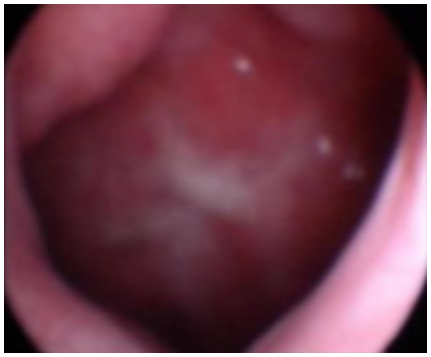
Nasal Closure



Pharyngeal Flap



Severe VPD



Submucous Cleft

(Submucous cleft)

Difficult to diagnose > triad :

1. Bluuish central line in soft palate.
2. Bifid uvula.
3. Post nasal notch (instead of spine).

- Contraindicated to adenoidectomy > Hypernasality.

4. Dysarthria

- **Definition:**
  - Any combination of disorders of respiration, phonation, articulation, resonance, and prosody, that may result from a neuromuscular disorder.

- **Types of dysarthria:**

type	1- flaccid	2- spastic	3- ataxia	4-dyskinetic	5-mixed
lesion	**Lower motor neuron level**	**Upper motor neuron level**	**Cerebellum level**	**Basal ganglia level**	**May the most common**
communication	Breathy phonation hypernasality.	Strained strangled. phonation. labored breathing.	Increased equal stresses. Irregular articulatory. breakdown.	A. Hypokinetic type (Parkinsonism): breathy phonation rapid rate. B. Hyperkinetic type: i. Quick hyperkinetic (Chorea): variable rate and loudness. ii. Slow hyperkinetic (Athetosis): slow rate	- Examples: 1.Motor neuron disease. 2.Flaccid+Spastic Multiple. sclerosis: Ataxic. Spastic. 3. Wilson's disease: Ataxic + Spastic + Hypokinetic

➢ **Assessment of dysarthria:**

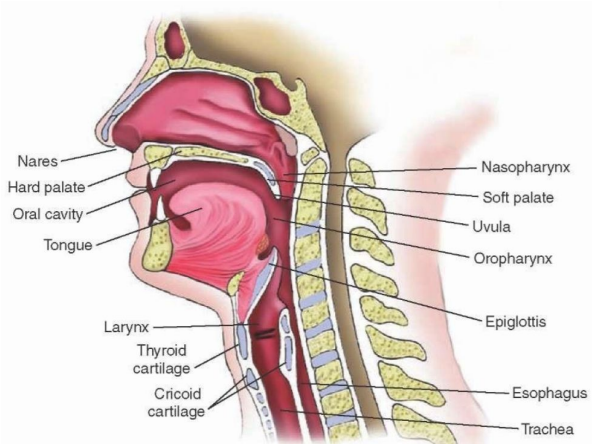
- History taking.
- Physical examination: mouth, palate ,neurological exam,
- Investigations:
  - Audio recording.
  - MDVP.
  - CT/MRI brain.
  - Dysphasia test.
  - Articulation test.
  - Psychometry (IQ).
  - Audiometry.
  - Nasometry.
  - Aerodynamics (Aerophone II).
  - Fiberoptic nasopharyngolaryngoscopy.

➢ **Management of dysarthria:**

- Individualized:
  - Management of the cause.
  - Patient counseling.
- Communicative therapy:
  - Articulation.
  - Phonation.
  - Resonance.
  - Respiration.
  - Prosody.

➢ **Alternative and augmentative communication.**

3. Voice disorders:



10% of communications disorders.
Prerequisites of "normal" voice production:

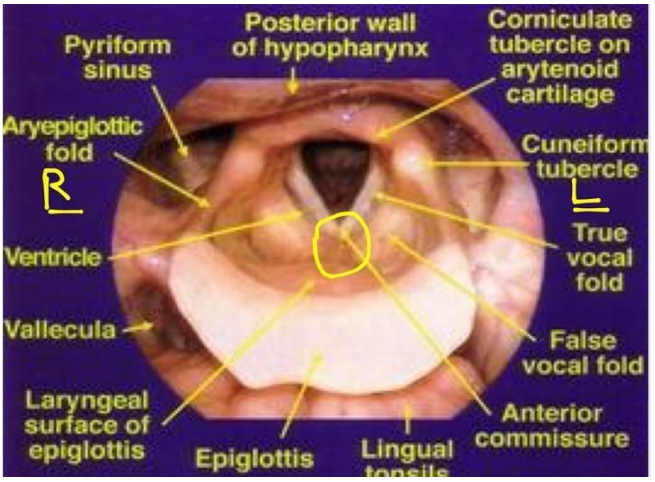
- Normal range of movement of vocal folds.
- Normal mobility of mucosa on deep layers.
- Optimal coaptation of vocal folds' edges.
- Optimal motor force.
- Optimal pulmonary support.
- Optimal timing between vocal fold closure and pulmonary exhalation.
- Optimal tuning of vocal fold musculature (int. & ext.).

usually the presenting symptoms in voice disorders are:

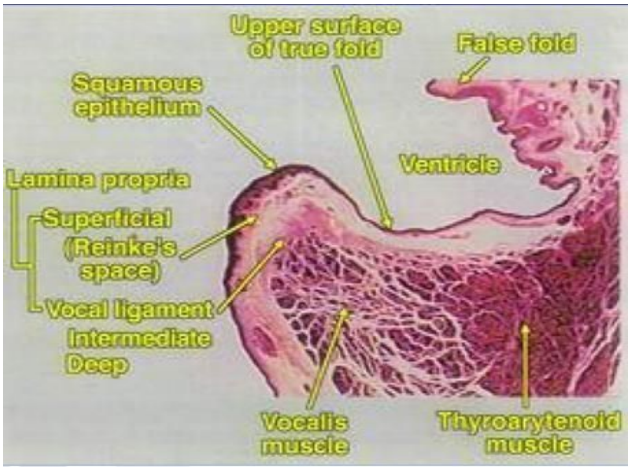
- Dysphonia: Any change of the patient's voice from his- Hoarseness" = roughness & harshness of voice.
  - = Objective, we don't like + Dysphonia is more broad (includes high pitched)
- Aphonia: Loss of the patient's voice (functional or organic).
- Phonasthenia: voice fatigue.
- Dysodia: Change of the singing voice while the speaking voice is normal.

★ **Assesment:** Hx+PEx+Ix (mainly endoscopy)

VERY IMPORTANT: Know the anatomy and the sides (right or left, which depends on Ant. Commissure)



➔ To decide the side of any part of the larynx lesion (eg: vocal cord lesions) whether it's right or left side lesion(consider the land mark anteriorly is :
- ○ Anterior commissure and epiglottis
- ➔ and your posterior land mark is :
- ○ Arytenoid cartilage and hypopharynx) because in the EXAM some picture will be inverted , so it's very important to know the correct site of the lesion .



➔ Cross section of the vocal cords which contains:

- Mucosa:
- ○ 1-Squamous epithelium

- 2-lamina propria which contains: - the superficial layer - the intermediate and deep layers which form the vocal ligament

➢ Etiology:

Organic

- Congenital - Inflammatory - Traumatic - Neurological - Neoplastic - Hormonal - Status post-laryngectomy.

Non-organic (normal Phx)

- Habitual
  a. Hyperfunctional childhood dysphonia.
  b. Incomplete mutation.
  c. Phonasthenia (Voice fatigue). 4.Hyperfunctional dysphonia.
  d. Hypofunctional dysphonia.
  e. Ventricular dysphonia.
- Psychogenic.

Minimal Associated Pathological Lesions (MAPLs)

Accompaniment of Neuro- psychiatric Ailments

➢ Assessment of dysphonia:

- History taking.
- Physical examination: APA , neck ,
- Investigations:
  - Audio recording.
  - Digital laryngostroboscopy.
  - Digital laryngo kymography.
  - Acoustic analysis (MDVP).
  - GERD (LPR) work-up.
  - CT neck.
  - Aerodynamic analysis (Aerophone II).

- Rigid scope is better, but use flexible with in-cooperative pts.
- CSL=Acoustic analysis of voice, intensity and frequency(Quantities).

➢ Management of voice disorders:

- Pharmacological agents. Ex.GERD
- Surgical procedures (Phonosurgery).
- Technical aid devices.
- Voice therapy.

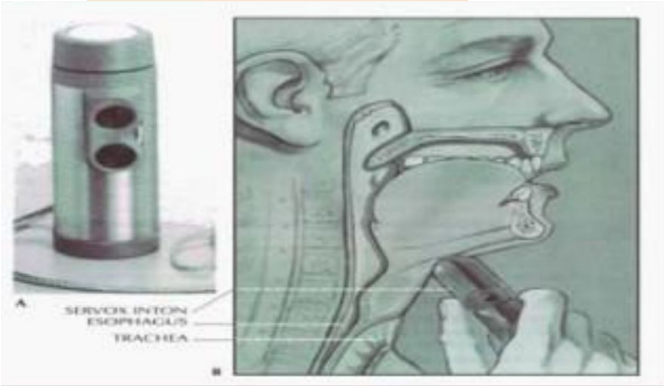
★ Video-stroboscopy with flexible or rigid laryngoscopy.

★ Pharyngeal pH monitoring for GERD, A device fixed in the oropharynx and sense the pH or reflex.

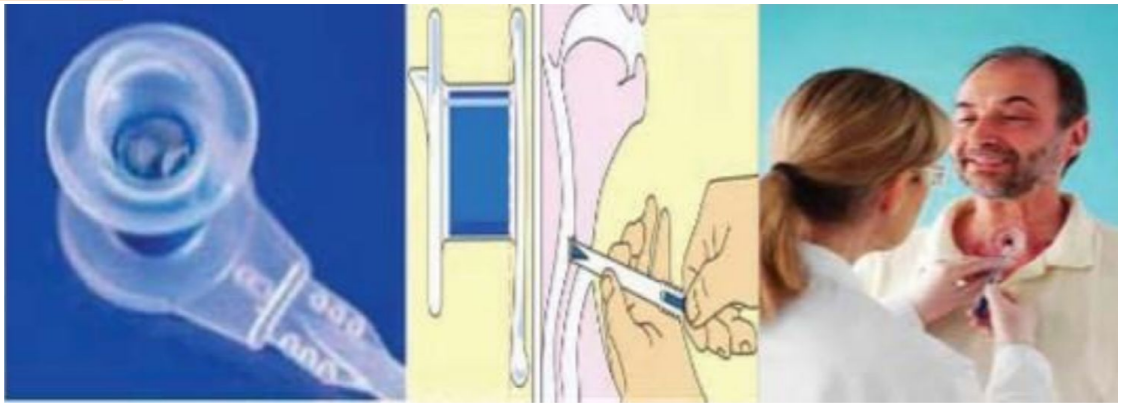
★ Computerized speech lab (CSL) For voice analysis.

★ Phonatory aerodynamic system(PAS) asses the phonatory airflow during(phonation and vibration)

★ Artificial larynx in a patient who got a total laryngectomy, can induce mechanical voice but most of patient don't like it.



★ Tracheo-esophageal-puncture: it's the most common procedure done for the patient who undergo a total laryngectomy, as an instrument inserted in the trachea and through air entry into the trachea, the phonation will occur.

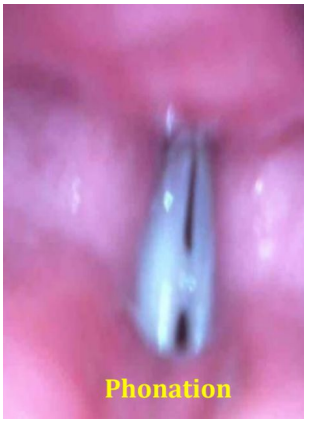


★ **Etiological classification of dysphonia:** (this classification will help u w/ the table in the next slides)

• **Organic:** ○ Suclus vocalis. ○ Laryngeal carcinoma. ○ Vocal fold paralysis. • **Non-organic:** ○ Phonasthenia. ○ Hyperfunctional dysphonia.	• **Minimal Associated Pathological Lesions (MAPLs):** ○ Vocal Fold Nodules: Adult Type. ○ Vocal Fold Polyp. ○ Vocal Fold Cyst. ○ Reinke's Edema. ○ Contact Granuloma.

Cases recorded by laryngoscopy with explanation/Pay attention to (description, cause, Tx).

❖ Vocal fold nodules (adult)

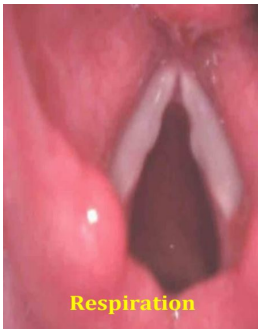


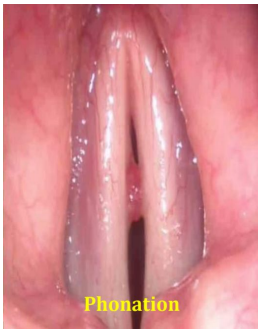
- ➢ Bilateral nearly small symmetrical lesions at the junction of anterior and middle two-thirds of membranous vocal folds.
- ➢ Present with dysphonia.

- **Causes**: vocal misuse and abuse, and chronic repetitive phonotrauma.

- **Treatment**: voice therapy. , voice arrest. with vocal hygiene advice)
  - Surgery (rarely)is indicated if case of asymmetrical lesions, fibrotic lesions, or failed therapy.

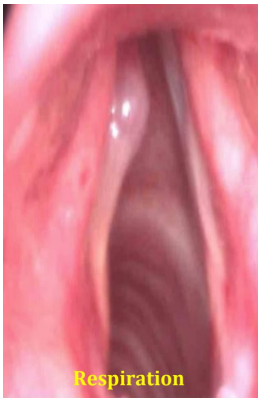
❖ Left vocal fold polyp

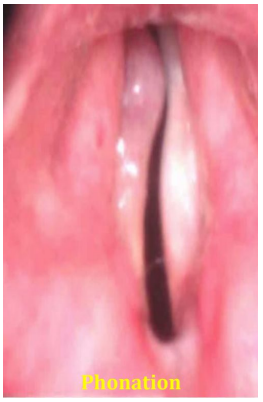




- **Etiology** :by acute phonotrauma.
- **Describe** : usually Unilateral Can be bilateral and nearly in the same area.
- Red polyp = hemorrhagic wait and re evaluate.
- **Treated** by surgical excision and post-op voice thereby.

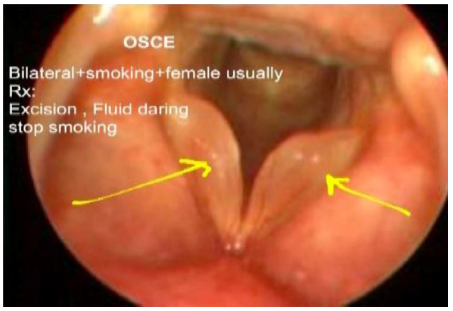
❖ Vocal cord cyst

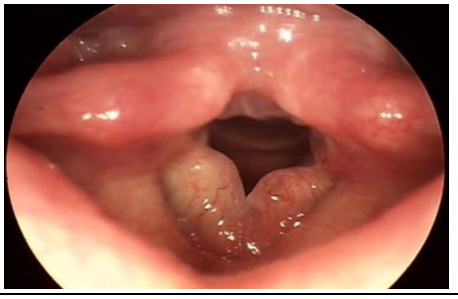




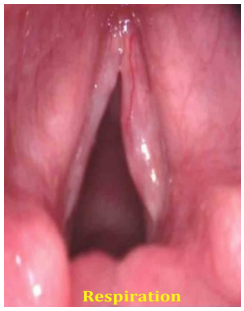
- Localized intra-foldal lesion with il-defined edge unilateral usually in anterior ⅔.
- **Etiology** : phonotrauma and could be congenital.
- The mucosal waves on digital laryngostroboscopy are missed because they can't cross the dense mass.
- **Treatment**: surgical excision followed by post-op voice therapy with voice hygiene advice.

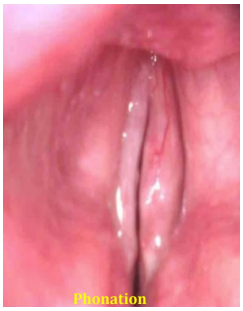
❖ Reinke's edema :



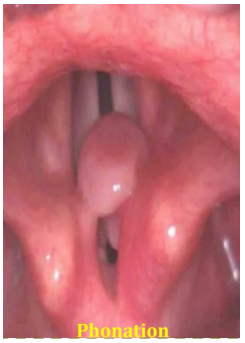


- Reinke's edema is usually bilateral and could be unilateral.
- **Etiology** : phonotrauma, smoking and reflux (GERD).
- It is common among middle-aged **smoker** active women.
- **Treated** :smoking cessation, reflux medications and surgery.
- ★ Pics below R right reinke's, pics on the right side R bilateral.

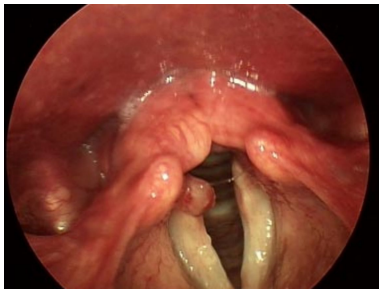


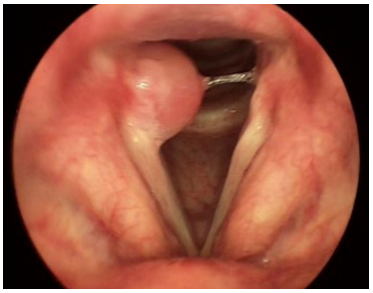


❖ Right contact granuloma

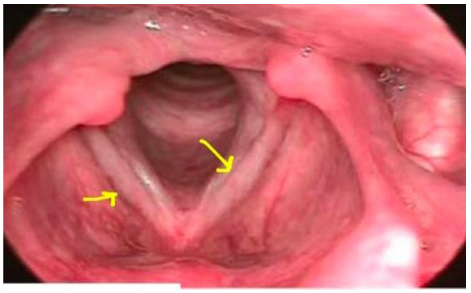


- Contact granuloma grows on the posterior glottis.
- **Etiology** :
  - Intubation.
  - Phonotrauma - severe laryngopharyngeal reflux.
  - **If there is a history of intubation it's intubation granuloma.**
- **Treatment** :
  - Treat **the cause** (Reflux).
  - Avoid surgery because of risk of recurrence, unless the lesion was big enough to obstruct the airway or if it is not responds to medical therapy.





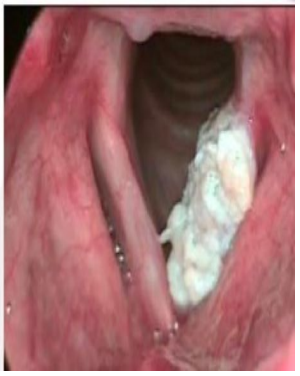
❖ Sulcus vocalis (sulcus)



- is a groove or infolding of mucosa along the surface of the vocal folds it has a genetic predisposition.
- present with dysphonia.
- treated by: vocal folds injection(filler).

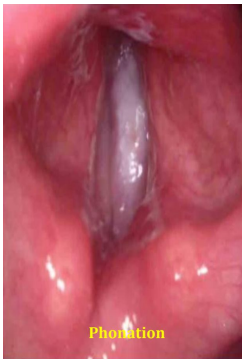
❖ Laryngeal carcinoma

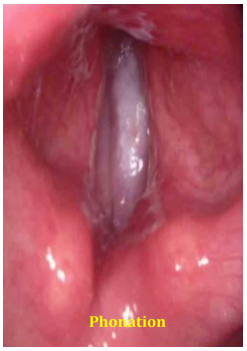
squamous cell carcinoma is the most common.



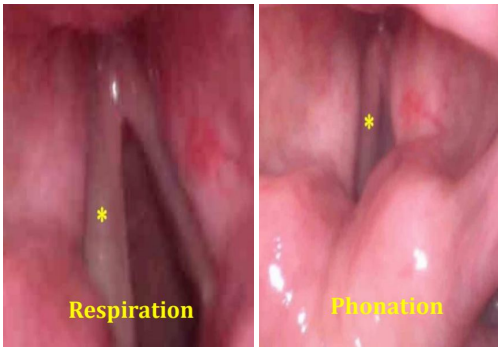
- **Risk factors :**
  - Tobacco use - Excessive ethanol use Infection with human papillomavirus Increasing age.
- **Management :**
  - Early stages(I-II : radiation or surgical).
  - techniques Late stages (III-IV) : total laryngectomy, reconstruction, and adjuvant postoperative chemoradiation therapy.

piriform fossa is a common site for foreign body to get trapped in the good thing is you can scope and remove it in clinic.



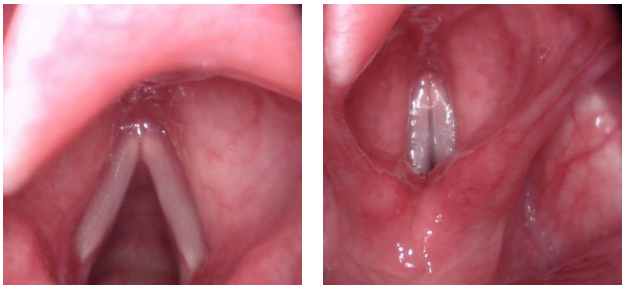


❖ Vocal cords paralysis:



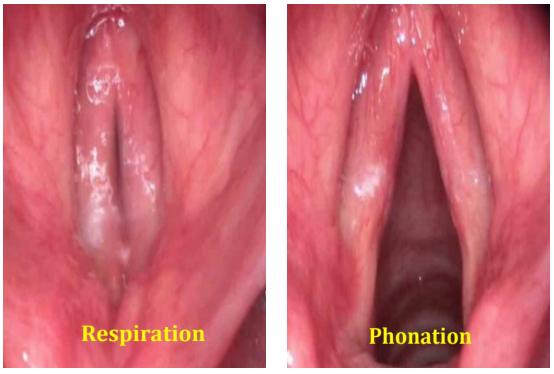
- Here left vocal cord is paralyzed.
- How it present? (unilateral).
- Dysphonia- aspirations.
- If it's bilateral how it present?.
- Airway obstruction – swallowing abnormality.
- How is it diagnosed?.
- History (course , trauma , trauma in delivery if infant , CNS abnormality , intubation , surgery).
- Management ? Tracheostomy(ER) or Posterior cordotomy or Suture lateralization.

❖ Phonasthenia :



- Phonasthenia is the most common one, could be due to voice problem or reflux.
- Treated by voice therapy.
- With voice fatigue . also phonatory gap "voice therapy"

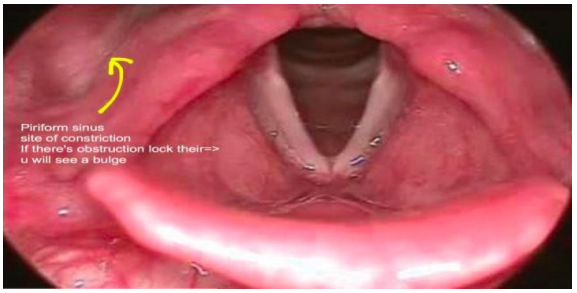
❖ Hyperfunctional dysphonia :



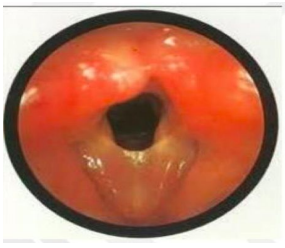
- Usually due to misuse of voice:
  - (kids, singers , teachers).
- Might be found in males that didn't acquire the voice change during their adolescence.
- No organic changes found, normal larynx maybe increase in vascularization , and decreases in phonatory gap.

➔ **The rest are EXTRA:**

- **Piriform fossa : is a site of constriction which means it's a** common place for food to become trapped.
  - injury in this area gives a feeling of food stuck in throat.
  - It's also a commonest site for hypophyseal Carcinoma.

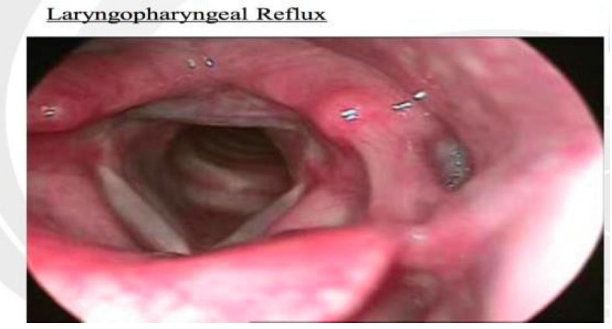


- **Congenital vocal cords web:** incomplete recanalization of the laryngotracheal tube most common site in level of vocal cords.
  - Present: mild dysphonia to significant airway obstruction.
  - **Management : surgical lysis of the webs with laser or cold knife.**



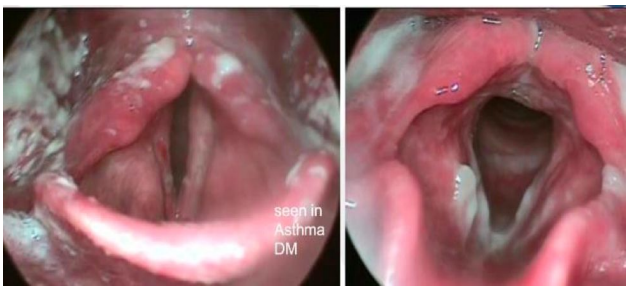
- **Congenital laryngeal cleft:**
  - Rare abnormality in the posterior laryngeo-tracheal wall resulting in incomplete closure of larynx during swallowing.
  - Present with: abnormal feeding , and failing to gain weight.
  - Treatment : filler injections but depends on degree.

- **Laryngopharyngeal reflux**
  - Present with :throat clearing, cough, and hoarseness.
  - Usually examined with flexible laryngoscope.
  - Findings :edema and erythema. Management : PPIs and diet changes , lifestyle modifications , stress management.

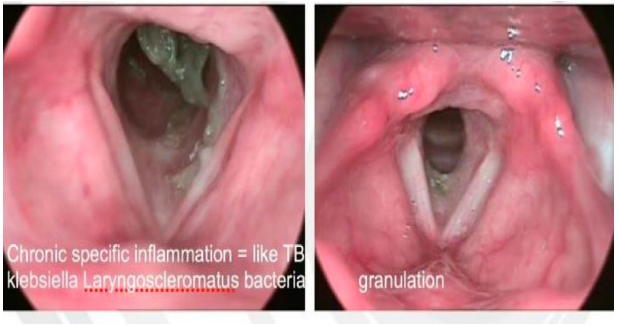


- **Laryngomalacia : means soft larynx:**
  - The epiglottis becomes soft and floppy and cannot maintain it arch shape so it forms a <u>omega shape.</u>
  - It present with stridor at babies usually 6 months it's self corrected around 12-18 months if not resolved surgery.
  - Diagnosed by : laryngoscopy.

- **Fungal infection**
  - Seen in immunocompromised patients ,Diabetics , or those taking inhaled steroids. mostly candidiasis
  - superficial colonization of the mucosa; the oral cavity is often involved.

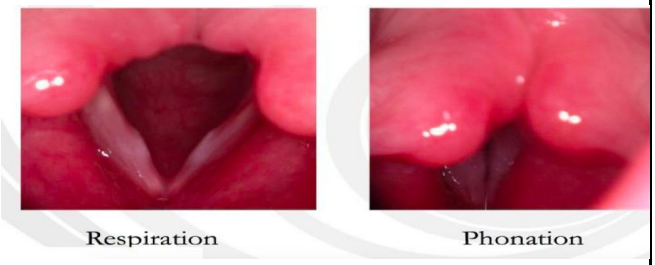


- **Laryngoscleroma**
  - is rare chronic specific granulomatous infection of larynx cause by a bacteria called K rhinoscleromatis.



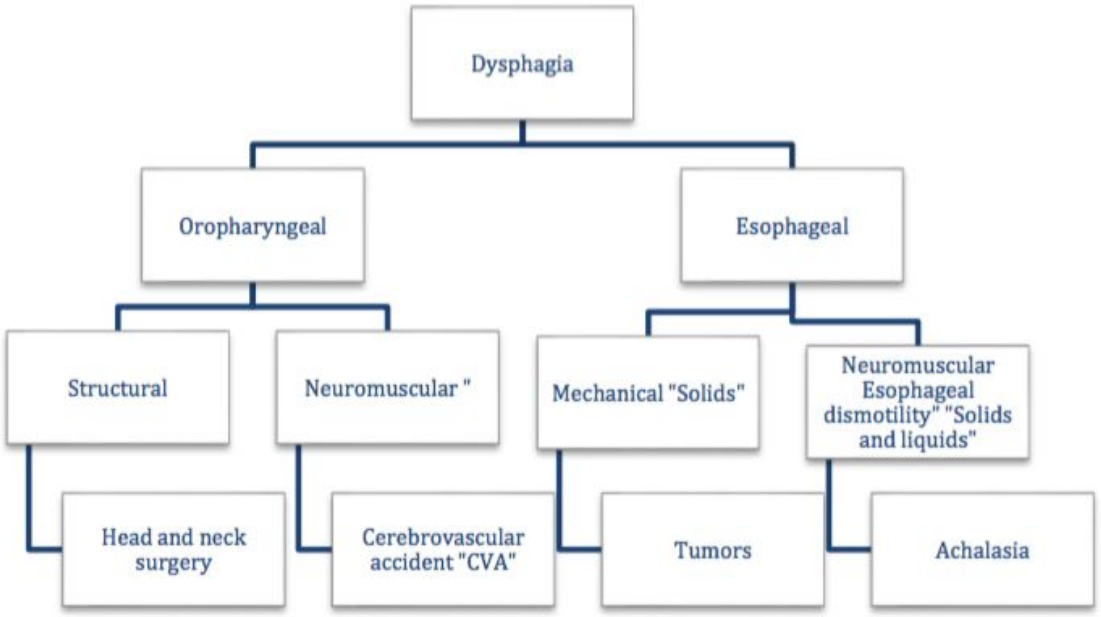
- **Vocal fold nodules (juvenile)**

Same but in pediatrics



★ **Stroboscope:**

- ✓ is a special method used to visualize vocal fold vibration.
- ✓ It uses a synchronized, flashing light passed through a flexible or rigid telescope.
- ✓ The flashes of light from the stroboscope are synchronized to the vocal fold vibration at a slightly slower speed, allowing the examiner to observe vocal fold vibration during sound production in what appears to be slow motion
- ✓ females reach 300 cycle/ sec
- ✓ Males reach 120-130 cycle/ sec



Swallowing disorder:

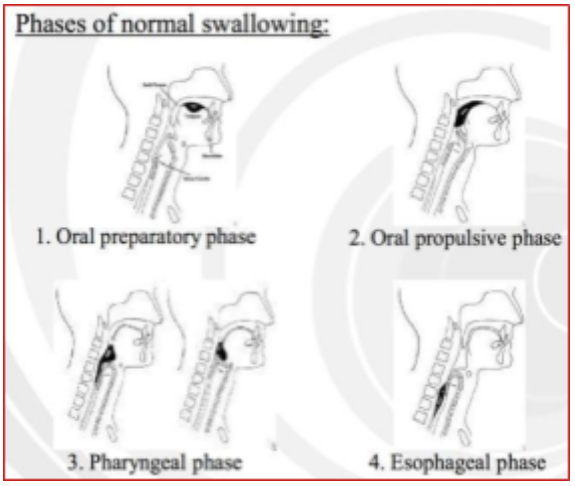
➢ Definition:

- Difficulty in moving food from the mouth to the stomach".
- "Odynophagia" = painful swallowing due to a disorder of the esophagus.

➢ Consequences of dysphagia:

- Dehydration.
- Weight loss.
- Aspiration pneumonia. (MOST dangerous)
- Airway obstruction.
- Loss of joy of eating.

➢ Assessment of dysphagia:



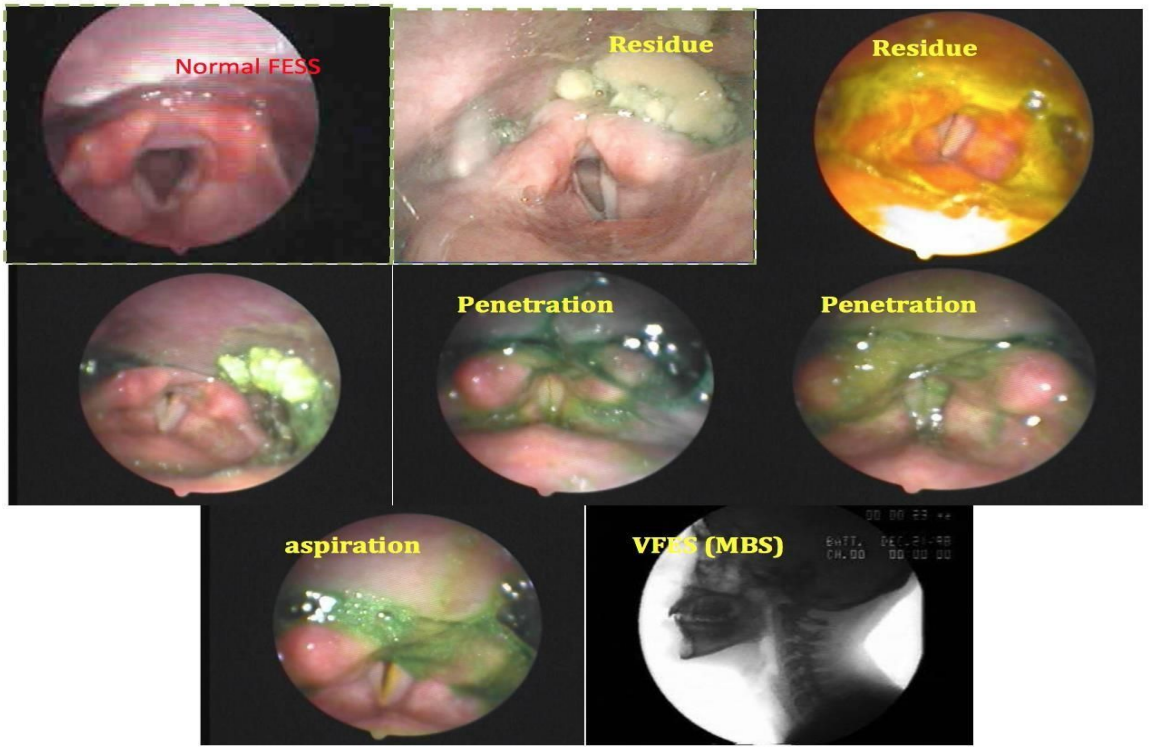
A. History taking
B. Physical examination:
   a. General examination
   b. Language and speech assessment
   c. Vocal tract examination
   d. Neck examination
   e. Trail feeding

C. Investigations:

- **--- FEES "Fiberoptic endoscopic evaluation of swallowing"**
- **--- VFES (MBS) "Video fluoroscopic swallowing exam"(Modified barium swallow)**
- --- GERD (LPR) work---up

- FEES protocol of evaluation (Langmore, 2003):
  A. Anatomic and physiologic assessment.
  B. Assessment of food and liquid swallowinG
  C. Assessment of therapeutic interventions.

Note:
Penetration= at the vocal cords, down to trachea= aspiration



Management of dysphagia:

1. Swallowing therapy:
   a. Diet modification.
   b. Dysphagia with water?? Try make it more thick=> juice.
   c. Postural techniques.
   d. Swallowing maneuvers.
   e. Sensory enhancement techniques.
   f. Motor exercises.
2. Surgical treatment, eg medialization laryngoplasty.
3. Medical (Drug) treatment, eg anti-parkinsonism drugs.
4. Intraoral prosthesis.
5. Alternative routes of feeding, eg NG tube feeding.