



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.

Most important: voice, swallowing, hypernasality

[Color index : **Important** | **Notes** | Extra]

Resources: Slides+434 team+Notes.

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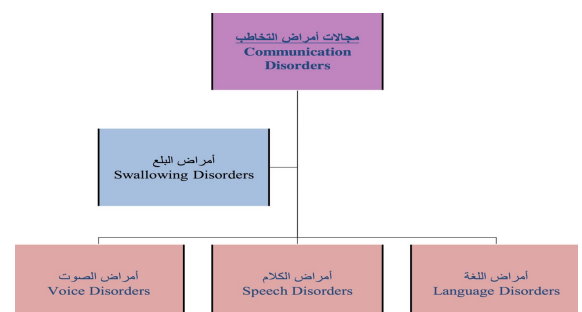
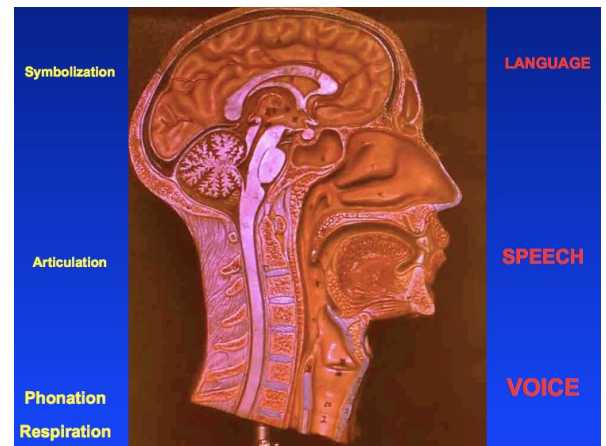
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DEFINITIONS

Communication	<ul style="list-style-type: none"> • Exchange of thoughts, ideas, emotions between two parties • Types: -Verbal -Non verbal • Parts of communication: 1-Voice 2-Speech 3-Language (try to mention them in this order)
Voice	<ul style="list-style-type: none"> • The result of vibration of the true vocal folds using the expired air.
Speech (articulators)	<ul style="list-style-type: none"> • A neuro-muscular process whereby language is uttered تلفظ • It includes the coordination of respiration, phonation, articulation, resonance and prosody¹.
Language	<ul style="list-style-type: none"> • A symbolic arbitrary system relating sounds to meaning.

How communication happens? **Very Important**

- Inspiration → expiration → air passes through sound box (larynx) (expiratory phonatory airflow) → vibration of vocal folds (not cords!) → voice (primary laryngeal sound) → supralaryngeal compartments (pharynx, epiglottis, tongue, soft palate, teeth, sinuses) (articulators or resonators/speech) (they produce a person's recognizable voice) → symbolization by the brain (language)
- Function of supralaryngeal compartments: change of primary laryngeal sound (voice) into secondary sound (speech)
- Disorders of communication can occur in each of the following:
 - Language
 - Speech
 - Voice



Who is managing communication and swallowing disorders?

1. Phoniaticians (MD's)
 - a. A medical speciality that deals with communication and swallowing disorders.
 - b. It stems mainly from ORL (ENT), especially when dealing with voice disorders.
2. Speech-language pathologist

¹ Changing stress and tone of voice

A. Language Disorders:

❖ 1- Delayed Language Development (DLD)

→ **Definition:** Delay or failure to acquire language **matched** with age. Ex. 4 yr old child who knows 4 words only! i.e an 8 month old baby can't talk, you won't diagnose with DLD because at this age it's normal.

★ 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.

Boys' notes:

- Babies should say their first word at their 1st year (9 months – 1yr).
- At their 3rd year he should be able to say more than one sentence if not they 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.

→ **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 [to a lesser extent](#)

3. Psychiatric illness: Autism, Autism Spectrum Disorder (ASD).

4. Environmental deprivation: Lonely child, [first child](#), [last child](#)

5. Idiopathic. Specific Language Impairment (best prognosis).

→ **Assessment of DLD:**

1. History taking.

2. Physical Examination [of articulators](#)

3. Investigations:

- a. Psychometry (IQ).
- b. Audiometry. EEG.
- c. Brain Imaging.
- d. Ophthalmological consultation.

4. DLD sheet

→ 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).

◆ OSCE Stop



- What is this device called?
 - Cochlear implant
- What are the indications?
 - **Bilateral severe sensorineural hearing loss**

◆ 2- Dysphasia

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

→ Full development of speech:

- a. Females: 7.5 years (more stutter)
- b. Males: 8 years

★ **Types of dysphasia:** Not mentioned by the doctor

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,

B. Speech Disorders:

◆ 1- Dyslalia (misarticulation) لدغه

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

→ **Types: the first two are the most important**

→ **Sigmatism (/s/ defect):** سبورة

- a. Interdental stigmatism ثبورة
- b. Lateral astigmatism شبورة
- c. Pharyngeal sigmatism خبورة

→ **Rotacism (/r/ defect):** ريما: غيما=ويما=ليما=ييما

→ **Back-to-front dyslalia:** كورة

- a. /k/ → /t/ تورة
- b. /g/ → /d/

→ **Voiced-to-nonvoiced dyslalia:** /g/ → /k/ /d/ → /t/ /z/ → /s/

→ **Imitational dyslalia: parents have dyslalia → child never learned the correct sound**

→ **Assessment of dyslalia:**

- a. History taking
- b. Physical examination **tongue**
- c. Investigations

- Audio recording
- Audiometry
- Articulation test
- Psychometry
- Dyslalia sheet

→ **Management:**

- Treatment of the cause:
 - Tongue tie² (prevents elevation of the tongue (can't say La).
 - Dental anomalies (open bite).
 - Hearing aids
- Speech therapy with assistance and counseling.

❖ 2- Stuttering **تأتأة**

→ **Definition:** The **intra phonemic disruptions** resulting in sound **آآآسد** (first sound is prolonged), and syllable **repetitions** **أأأأسد**, sound prolongations (whole word is prolonged), and blocks. **Worst prognosis (MCQ!)**

→ **Types:**

- 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) **worse in females.**

Theories of Stuttering: The exact cause is unknown.

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

Assessment of stuttering:

- History taking.
- Physical examination
- Investigations:
 - Audio & video recording.
 - Stuttering severity.
 - Psychometry (IQ)
 - Articulation test.

² Tongue-tie (or ankyloglossia) is a 'congenital condition in which the tip of the tongue cannot be protruded beyond the lower incisor teeth because of a short frenulum'

e. Auditory Perceptual Analysis (APA).

Management:

1. Family and patient counseling.
2. Speech therapy:
 - a. Indirect therapy: if not aware. on the family side (slowing their talk).
 - b. Direct therapy: if aware

❖ Auditory Perceptual Analysis (APA) not mentioned by the doctor

1. Core behaviors:
 - a. Intraphonemic disruption.
 - b. Repetitions.
 - c. Prolongations.
 - d. Blocks.
2. Secondary reactions
 - a. Muscular activity and struggle
 - b. Interjection
 - c. Word substitutions and circumlocution
3. Concomitant reactions:
 - a. Fear.
 - b. Eye contact.
 - c. Skin pallor/flushing
 - d. Breathing (antagonism, interruption, prolongation, cessation, ...)

❖ 3- Cluttering التبعثر

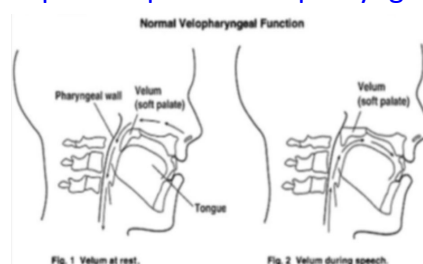
Not mentioned

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

❖ 4- Hypernasality IMP

❖ Definition:

- Faulty contamination of the speech signal by the addition of nasal noise. It results from velopharyngeal dysfunction (VPD) or insufficiency (VPI).
- Is a disorder that causes abnormal resonance in a human's voice due to increased airflow through the nose during speech.
 - Nasal tone (soft palate is open) is used in the letter M (M nasal = B oral) and N
 - Hyponasality → soft palate closed e.g. common cold, polyp, deviated septum, adenoid, chronic sinusitis. (M becomes B)
 - Hypernasality → soft palate open → velopharyngeal dysfunction (VPD).



❖ Etiology:

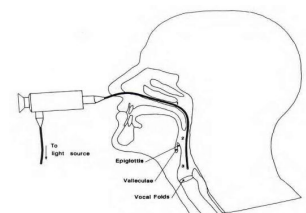
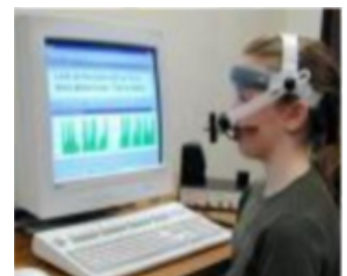
Organic	Non-organic
<p>1. Structural</p> <p>a. Congenital:</p> <ul style="list-style-type: none"> ● <u>Overt cleft palate.</u> ● <u>Submucous cleft palate.</u> ● Non-cleft causes: <ul style="list-style-type: none"> ○ Congenital short palate. ○ Congenital deep pharynx. <p>b. Acquired:</p> <ul style="list-style-type: none"> ○ Palatal trauma ○ Tumors of the palate and pharynx ○ Adenotonsillectomy <p>2-4 weeks => temporary (pain=> decrease movement=> more inx are needed if it exceeds 4 weeks> surgical error)</p> <p>2. Neurogenic: (VP Incompetence) Palatal U motor neuron lesion/ Palatal L motor neuron lesion.</p>	<ul style="list-style-type: none"> ● 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.

➤ **Assessment of hypernasality (VPD)**

- Parent interview.
- Perceptual.
- Simple tests:
 - Gutzman's (a/i) test: ask patient to say a,i,a,i tone will change
 - Czermak's (cold mirror) test: there will be condensation on the mirror (nasal emission)
 - Resonance, Articulation, Nasal air emission, Voice.
- Instrumental:
 - Nasopharyngoscopy.
 - Nasometry (first picture) = How much nasality u have?.
 - Fiberoptic nasopharyngolaryngoscopy.
 - Position 1 (high): soft palate
 - Position 2 (Mid): swallowing
 - Position 3 (Low): Voice



➤ **Management:** not mentioned by the doctor

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

- **Treatment Decision:**

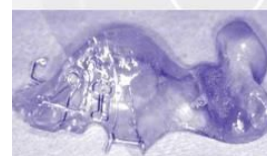
- **Velopharyngeal insufficiency:** surgery (speech therapy post-op).
- **Velopharyngeal incompetence:** surgery (speech therapy post-op) / prosthetic devices / speech therapy.
- **Velopharyngeal mislearning:** speech therapy.

- **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 cleft or fistula.
- Speech bulb: to occlude nasopharynx.



- ◆ **Submucous cleft**

- Difficult to diagnose > triad :
 - Bluish central line in soft palate.
 - Bifid uvula.
 - Post nasal notch (instead of spine).
 - Contraindicated to adenoidectomy > Hypernasality.

◆ 5- Dysarthria

- **Definition:**

- Any combination of disorders of respiration, phonation, articulation, resonance, and prosody, that may result from a **neuromuscular disorder**. **Brain and language are normal**

- **Types of dysarthria: only know the types**

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 be the most common

communication	Breathy phonation hypernasality.	Strained strangled. phonation. labored breathing.	Increased equal stresses. Irregular articulatory. breakdown.	A. Hypokinetic type (Parkinsonism): breathy phonation <u>rapid rate.</u> B. Hyperkinetic type: i. Quick hyperkinetic (Chorea): variable rate and loudness. ii. Slow hyperkinetic (Athetosis): <u>slow rate</u>	- Examples: 1. Motor neuron disease. 2. Flaccid+Spastic Multiple. sclerosis: Ataxic. Spastic. 3. Wilson's disease: Ataxic + Spastic + Hypokinetic
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➤ **Assessment of dysarthria:**

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

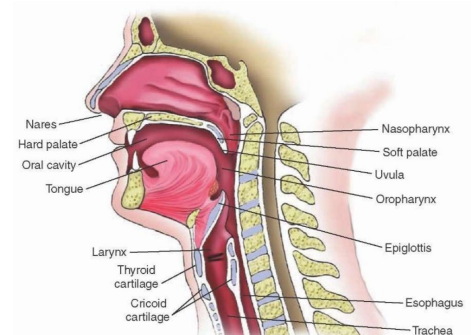
➤ **Management of dysarthria:**

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

➤ **Alternative and augmentative communication**

C. 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:
 - Difficulty in phonation
 - Change of the patient's voice from his/her habitual
 - Hoarseness: roughness & harshness of voice. **Objective term. Dysphonia is broader (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.

- **Anatomical landmarks of the larynx: IMP understand the picture so you can locate the lesion.**

- Anteriorly:
 - Anterior commissure and epiglottis
- Posteriorly:
 - Arytenoid cartilage and hypopharynx

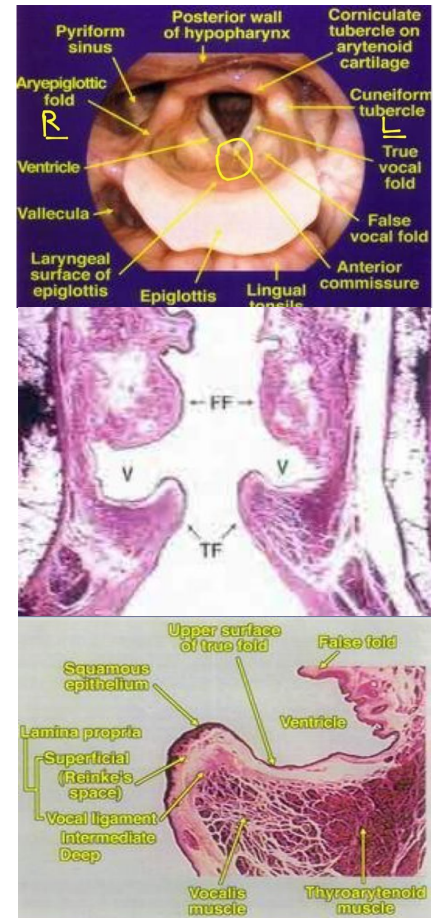
Pictures: As seen in the second picture the false vocal cords are on top of the true vocal folds and not next to them as it might appear in the first picture. FF=False folds V=Ventricle TF=True folds

→ Cross section of the vocal cords which contains:

- ◆ Mucosa:
 - Squamous epithelium
 - lamina propria which contains:
 - superficial layer
 - the intermediate and deep layers (vocal ligament)


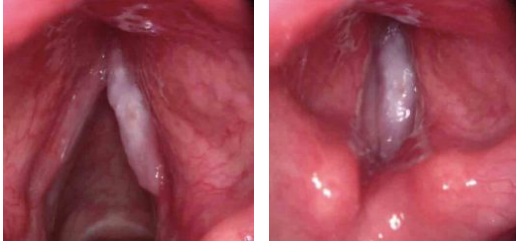

➤ Etiology:

- **Organic problem with the vocal cords**
- **Non-organic (normal Phx)**
- **Benign focal cord lesion**
 - Started as non organic then progressed to organic
- **Accompaniment of Neuro-psychiatric Ailments**



1- Organic voice disorders

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

<p>1- Sulcus vocalis</p> <ul style="list-style-type: none"> ● Congenital lesion ● (On the free edge of the true vocal fold) ● treated by: vocal folds injection(filler) 	
<p>2- Laryngeal cancer</p> <ul style="list-style-type: none"> ● squamous cell carcinoma is the most common. ● Risk factors: Tobacco use - Excessive ethanol use Infection with human papillomavirus Increasing age. 	 <p style="text-align: center;">Respiration Phonation</p>
<p>3- Left vocal cord paralysis</p> <p>Left vs right?</p> <p>1-Determine anatomical landmarks (anterior and posterior) to know which side is left and which is right</p> <p>2-During respiration vocal cords should be abducted if one of them is not abducted → paralysis. During phonation vocal cords should be adducted if one is not → paralysis</p> <p>You can not determine which cord is paralysed if you don't know if the picture is during inspiration or phonation</p> <p>How it presents?</p> <p>Dysphonia- aspiration (if unilateral)</p> <p>Airway obstruction - swallowing abnormality (if bilateral)</p>	 <p style="text-align: center;">Respiration Phonation</p>



2- Non organic voice disorders

- Habitual
 - a. Hyperfunctional childhood dysphonia.
 - b. Incomplete mutation.
 - Occurs in males during puberty. Change of voice from high frequency to low frequency voice.
 - c. Phonasthenia (Voice fatigue).
 - d. Hyperfunctional dysphonia.
 - e. Hypofunctional dysphonia. E.g. acute pharyngitis. Patient won't talk because of pain. If they stopped talking for more than 3 weeks it will be difficult to get back normal voice.
 - f. Ventricular dysphonia.
 - Misuse of voice will cause the ventricles to hypertrophy until they touch each other and dysphonia will occur (patient will sound like WWE fighter).
 - Normal function of ventricle: -Helps shape the cords -holds glands which decrease friction between false and true vocal cords -fine tuning.
- Psychogenic.




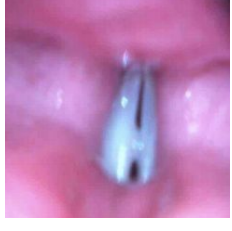
- a. Psychogenic dysphonia
- b. Psychogenic aphonia

- Notes:

- Misuse vs abuse of voice
 - Misuse: incorrect use of voice e.g. shouting
 - Abuse: overuse of voice
- Voice frequencies
 - Children: 200-250
 - Males: 100-125
 - Females: 200
- Male vs Female vocal cords
 - Male: 20-24 mm
 - Female: 18-19 mm

<p>1- Hyperfunctional dysphonia</p> <ul style="list-style-type: none"> • In professional voice users 	 <p style="text-align: center;">Respiration Phonation</p>
<p>2- Phonasthenia Most common</p> <ul style="list-style-type: none"> • E.g. Teacher can't talk after 5th period (fatigue) • Won't hear or see anything on examination 	 <p style="text-align: center;">Respiration Phonation</p>

3- Benign vocal cord lesions

1- Vocal fold nodule			
Juvenile type		Adult type	
			

Respiration
Phonation
Kissing nodules

Respiration
Phonation
Bilateral nodule in a female patient
More common in females

2- Vocal fold polyp

- More common in males
- From epithelial layer → well defined

Left vocal fold polyp with a reaction
(reaction occurs on the opposite side due to friction)



Left true vocal fold polyp



Multiple polypi

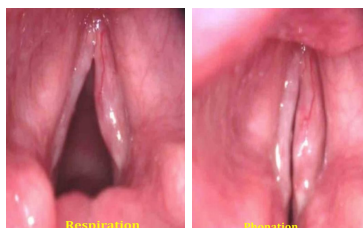
3- Vocal fold cyst

Arises from deeper layers → ill defined

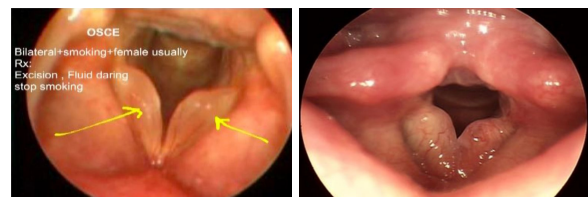


Etiology: phonotrauma, congenital

4- Reinke's edema



Right-sided reinke's edema



Etiology: phonotrauma, smoking, reflux
Common amongst middle aged female smokers

5- Contact granuloma



Why not polyp? It's in the posterior part (usual place for a granuloma)

More common in males 9:1

Etiology: voice misuse, reflux, intubation (intubation granuloma)

Management:

- Nodule, granuloma → voice therapy
- Polyp, Reinke's edema, cyst → removal and voice therapy

➤ 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).
 - Voice sheet
 - CSL=Acoustic analysis of voice, intensity and frequency(Quantities).

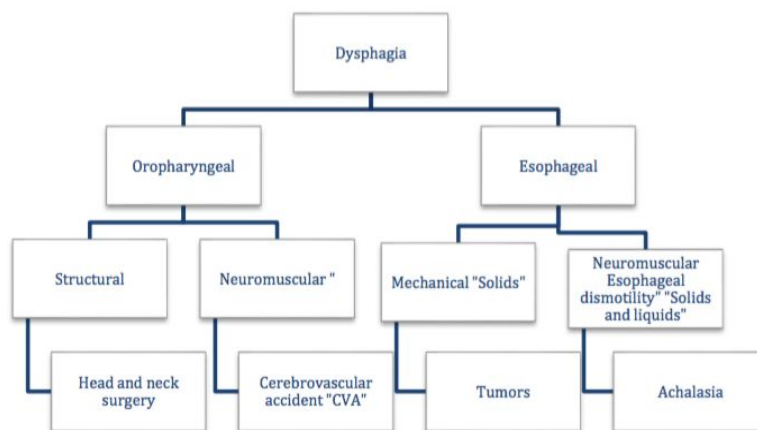
➤ Management of voice disorders:

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

★ 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 disorders:



➤ Definitions:

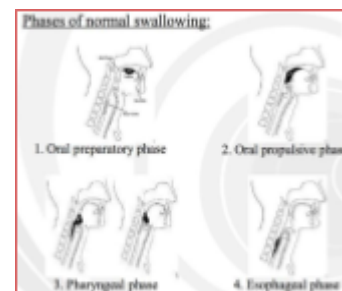
- Swallowing: is the successful (**timely and efficiently**) passage of food and drinks from the mouth to the stomach. **Happens 2,000-3,000 times/day**
- Dysphagia: pain, discomfort and/or difficulty in initiation or completing the act of swallowing
- Odynophagia: painful swallowing due to a disorder of the esophagus.

➤ Stages of swallowing:

- Oral (**voluntary**)
- Pharyngeal
- Esophageal

➤ Consequences of dysphagia:

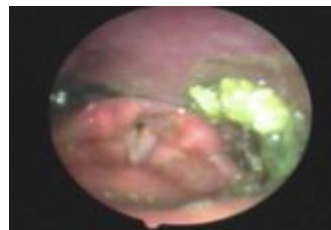
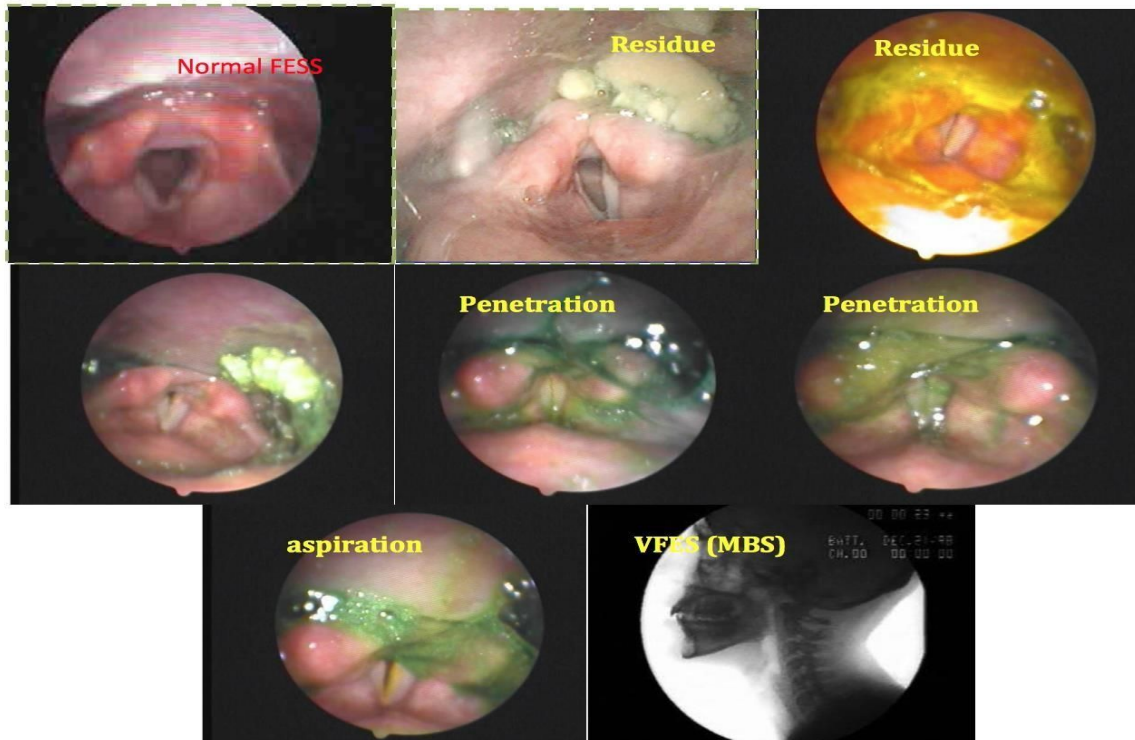
- Dehydration.
- Weight loss.
- **Aspiration pneumonia. (MOST dangerous)**
- Airway obstruction.
- Loss of joy of eating.



➤ 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
 - f. Dysphagia sheet
- C. Investigations:
 - --- FEES "**Fiberoptic endoscopic evaluation of swallowing**"
 - --- VFES (MBS) "**Video fluoroscopic evaluation of swallowing**" (**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.



Food stuck in the pyriform fossa (site of constriction)

- Notes:
 - Residue = in the pharynx, Penetration= at the true vocal folds, Aspiration=below vocal folds
 - If aspiration occurs, penetration must have occurred first (except in tracheoesophageal fistula where aspiration occurs without penetration)
 - Aspiration of liquid is more common but less severe than aspiration of solids

Management of dysphagia:

- Oral vs non oral feeding
 - Non oral feeding when
 - Aspiration >10%
 - Oral + pharyngeal transit time >10 s
- Direct vs Indirect therapy
 - Direct: food or liquid given to the patient
 - Indirect: no food or liquid given (only saliva)

- Compensatory vs Therapy technique
 - Compensatory: elimination of symptoms but no change in swallowing physiology, such as postural techniques
 - Therapy techniques: change of swallowing physiology such as swallowing maneuvers.

1. Swallowing therapy:

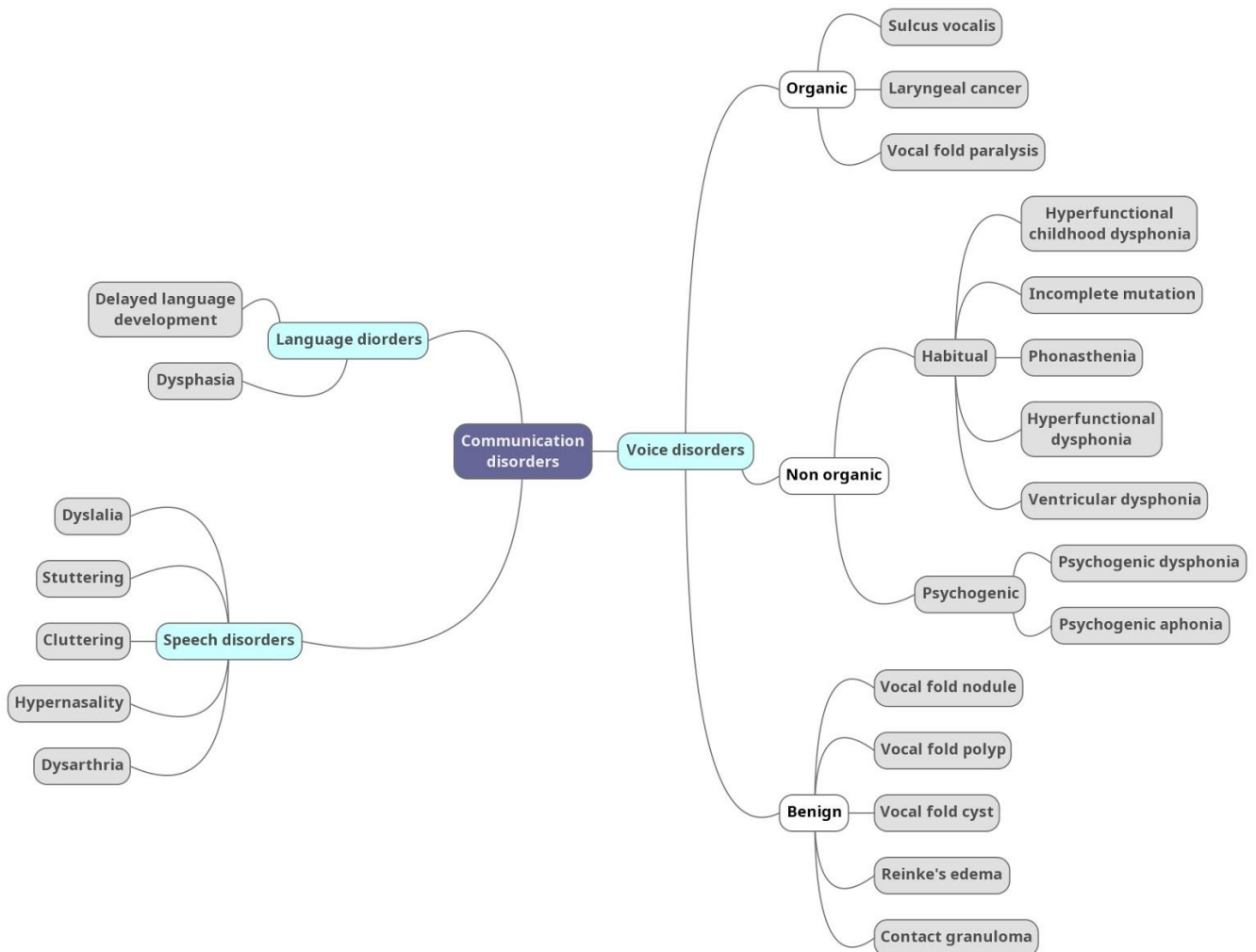
- Diet modification.
- Dysphagia with water?? Try make it more thick=> juice.
- Postural techniques.
- Swallowing maneuvers.
- Sensory enhancement techniques.
- Motor exercises.
- Bolus control cup³**

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. **Temporary (not more than 6 weeks)**
>6 weeks → gastrostomy



³ (dysphagia cups) are a style of adapted drinking cups that are designed for individuals who have problems swallowing safely