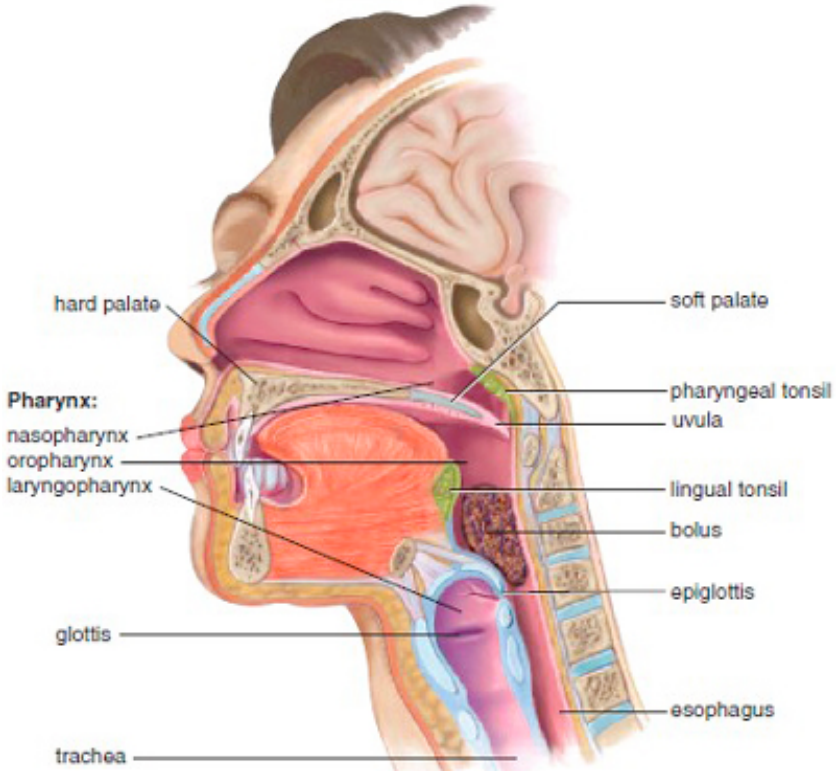


Communication and Swallowing I & II

429 ENT Team (F2)

Resources: Dr.Tamer Mesallam's lecure, student notes.

Objectives:

Communication and Swallowing I:
•Physiology of swallowing.

•Swallowing disorders.

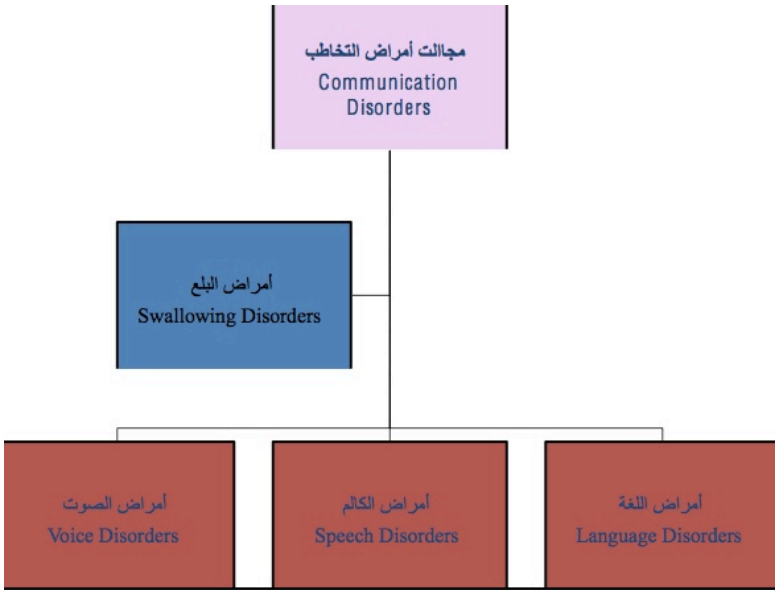
•GERD.

Communication and Swallowing II:
•Voice disorder.

•Language disorder.

•Speech disorder.

Done by: Bodoor Tayeb



Definitions:

Language:
A symbolic arbitrary system relating sounds to meaning.

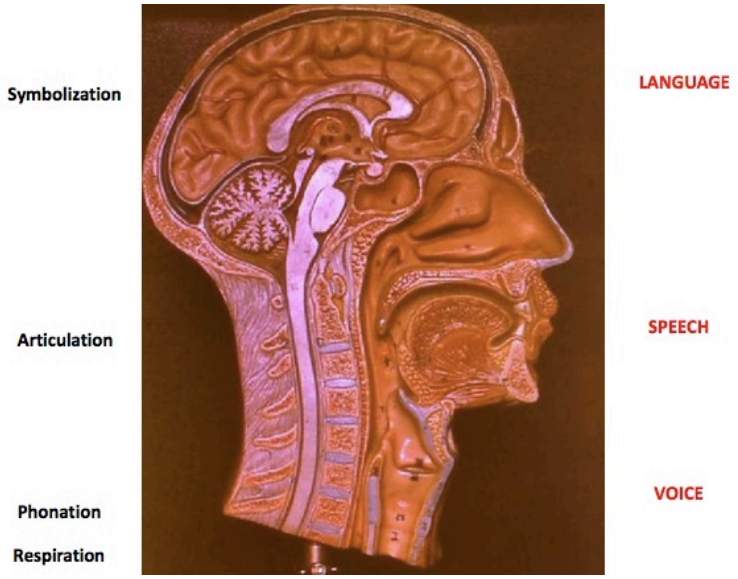
Speech:
A neuro-muscular process whereby language is uttered. It includes the coordination of respiration, phonation, articulation, resonation and prosody.

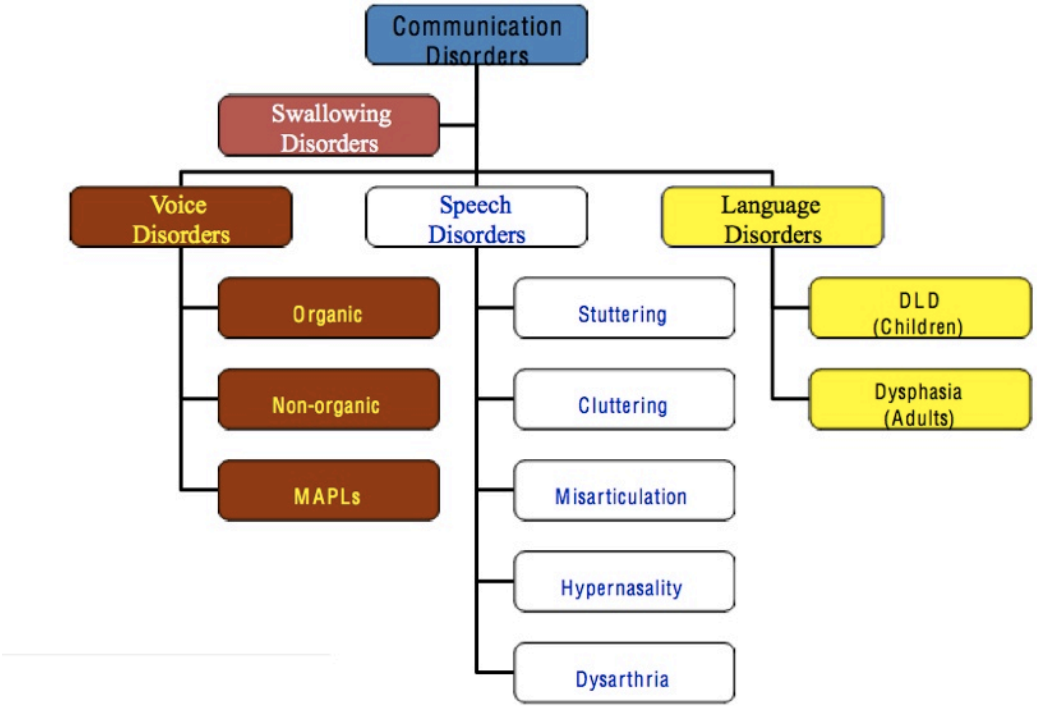
Voice:
The result of vibration of the true vocal folds using the expired air.

Swallowing:
The process of successful passage of food and drinks from the mouth through pharynx and esophagus into the stomach.

☆ In order to speak we need:

1- respiration (exhalation) →a-voice
2- phonation (vocal cord) → ″ ″ ″ ″
3- articulation → b-speech
4- symbolization → c- language





Language Disorders

[1] Delayed Language Development (DLD)
[2] Dysphasia

[1] Delayed Language Development (DLD)

Definition:
Delay or failure to acquire language matched with age.

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
-Anterior language area mainly in the temporal region concerned with expressive aspect.
-Posterior language area mainly in the parietal region concerned with receptive aspect.

Structural domains of language;

-Semantics; meaning.
-Phonology; articulation
-Syntax; grammar

Stages of normal language development

•2-4 months;	Babbling
•6 months;	Vocal play
•9 mo-1 year;	1st word
•1-1/2 years;	20 words
•2 years;	200 words, 2 word sentence
•3 years;	2000 words, 3 word sentence
•4 years;	4 word sentence
•5-7 years;	Full maturation of all language modalities.

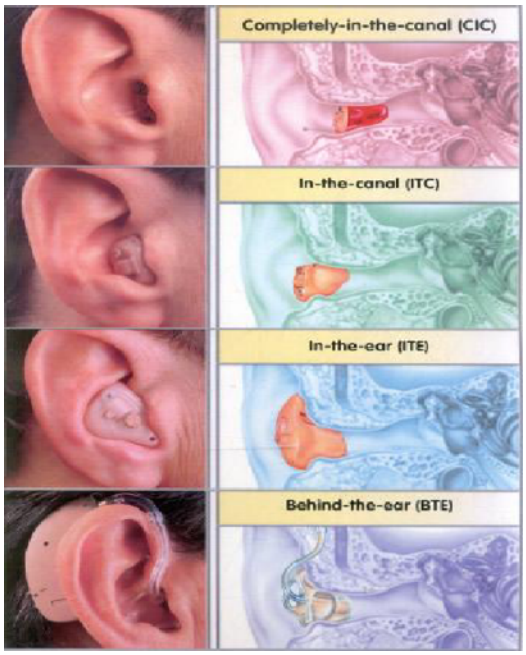
Pre-requisites of normal language development

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

Etiology of delayed language development:

A- Brain damage:

- Diffuse subcortical lesion (M.R.).
- Localized brain damage with motor handicap (BDMH).
- Minimal brain damage (ADHD).



B- Sensory deprivation:

- Hearing impairment
(Conductive, Sensorineural, Mixed or Central auditory processing disorder)
- Visual impairment

C- Psychiatric illness:

- Autism.
- Autism Spectrum Disorder (ASD).

D- Environmental deprivation

E- Idiopathic (Specific Language Impairment).

Assessment of language development:

I. History taking.
II. Physical examination.
III. Investigations:

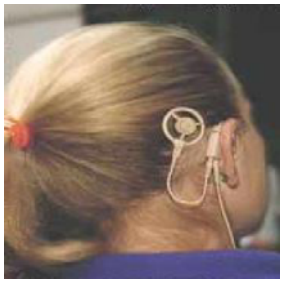
- Psychometry (IQ).
- Audiometry.
- Brian Imaging
- EEG
- Ophthalmological consultation

Management of DLD:

- Early detection.
- Providing the suitable aid:

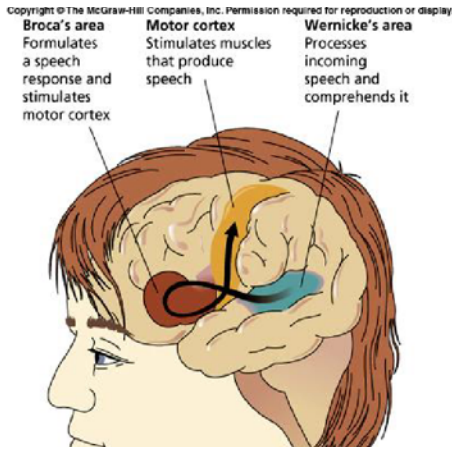
a.Hearing (HA or CI).
b.Physiotherapy Family counseling.
c.Visual Aid.

- Direct language therapy (Individual- group).
- Medications (Autism and ADHD).



[2] Dysphasia:

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



ex:
if a 12 y/o boy lost his language after it already developed , we call it dysphasia because language is fully developed

Etiology:
CVA, Neoplastic, Traumatic, Inflammatory, Degenerative, Metabolic, Poisoning

Types of dysphasia:
1. Expressive. 2. Receptive. 3. Mixed predominantly expressive.
4. Mixed predominantly receptive. 5. Global.

Assessment of Dysphasia:
I. History taking.
II. Physical examination: ... , neurological exam.
III. Investigations:
- CT / MRI brain.
- Psychometry (IQ).
- Dysphasia test.
- Audiometry.

Management of Dysphasia:
-Management of the cause.
-Physical rehabilitation (Physiotherapy).
-Family counseling.
-Language therapy.
-Alternative and augmentative communication.

Speech Disorders:

1. Dyslalia (Misarticulation):

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

Types of dyslalia:

A) Sigmatism (/s/ defect):-
- Interdental sigmatism.
- Lateral sigmatism.
- Pharyngeal sigmatism.

B) Back-to-front dyslalia:-
/k/ /t/
/g/ /d/

C) Rotacism (/r/ defect).

D) Voiced-to-nonvoiced dyslalia:-
/g/ /k/
/d/ /t/
/z/ /s/ etc…

Assessment of dyslalia:

I. History taking.
II. Physical examination: ... , tongue, ...
III. Investigations:
- Audio recording. - Articulation test.
- Psychometry (IQ). - Audiometry.

Management of dyslalia:

a. Treatment of the cause:
-Tongue tie.
-Dental anomalies.
-Hearing aids
b. Speech therapy.

2. Stuttering:

Definition:

The intraphonemic disruptions resulting in sound and syllable repetitions, sound prolongations, and blocks.

Normal dysfluency:

- Less than 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)

Theories of Stuttering:

The exact cause is unknown.
- Organic theory.
- Neurosis theory.
- Learning theory.

Assessment of stuttering:

I. History taking.
II. Physical examination: APA, VPA, ...
III. Investigations:
- Audio and video recording.(explained next)
- Stuttering severity (eg SSI).
- Articulation test.
- Psychometry (IQ).

Auditory Perceptual Analysis (APA):

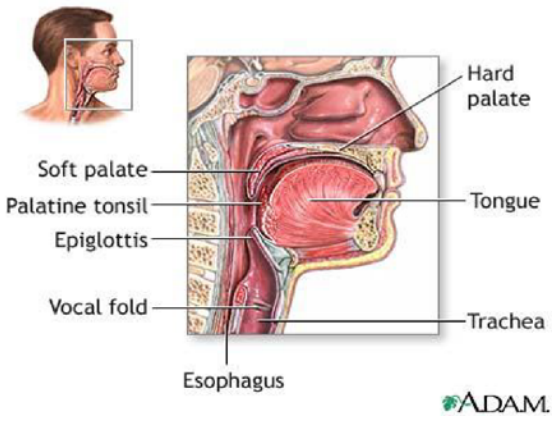
A. Core behaviors:
- Intraphonemic disruption. - Repetitions. - Prolongations. - Blocks.

B. Secondary reactions:
- Muscular activity and struggle. - Interjection. - Word substitutions and circumlocution.

C. Concomitant reactions:
- Fear.
- Breathing (antagonism, interruption, prolongation, cessation, ...).
- Eye contact.
- Skin pallor/flushing.

Management of stuttering:

I.Family and patient counseling.
II.Speech therapy:
a. Indirect therapy: if not aware.
b. Direct therapy: if aware.



3. Hypernasality:

Definition:

Faulty contamination of the speech signal by the additior
velopharyngeal insufficiency (VPI).

Velum: At rest and during speech

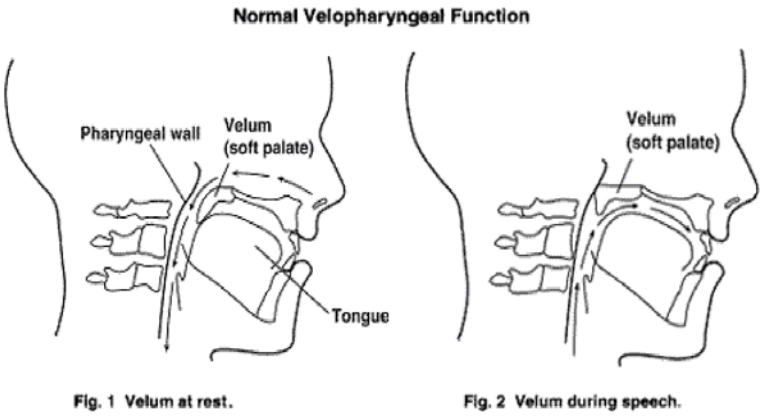


Fig. 1 Velum at rest. Fig. 2 Velum during speech.

Causes of hypernasality:

I. Organic:

1.Structural: (VP Insufficiency)		2. Neurogenic: (VP Incompetence)
a) Congenital:	b) Acquired:	- Palatal upper motor neuron lesion. - Palatal lower motor neuron lesion.
- Overt cleft palate. - Submucous cleft palate. - Non-cleft causes: a.Congenital short palate. b.Congenital deep pharynx.	- Adenotonsillectomy - Palatal trauma. - Tumors of the palate & pharynx.	

II. Non-organic (Functional) VP Mis-learning:

- Faulty speech habits.
- Mental retardation.
- Neurosis or hysteria.
- 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)



1-Parent interview

2-Perceptual.

a. Simple tests:
   - Gutzman's (a/i) test
   - Czermak's (cold mirror) test.

b. Resonance.

c. Articulation.

d. Nasal air emission.

e. Voice

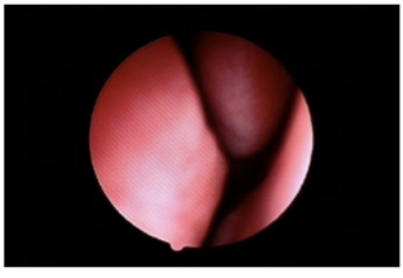
3- Intra-oral evaluation

4- Instrumental:
   - Nasopharyngoscopy
   - Nasometry

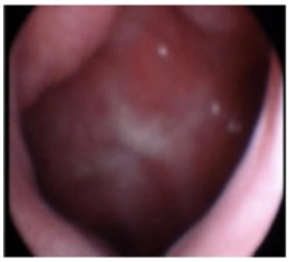
Gutzman's (a/i) test: tell the patient to say a/i while the nose is open then again while the nose is closed (normally there is no difference)

Submucus Cleft

Normal closure

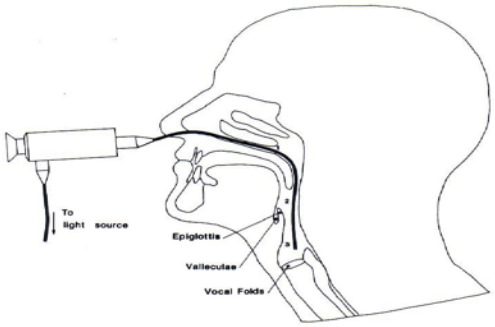


Severe VPD



Nasometry

Flexible nasopharyngoscopy



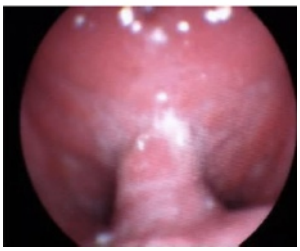
Management of VPD:

-Multidisciplinary team.
-Family counseling .
-Management of feeding problem.
-Management of otological and audiological problems.
-Surgical intervention.
-Orthodontic intervention.
-Phoniatric intervention (language, speech, voice).

Treatment Decision:

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

Pharyngeal flap

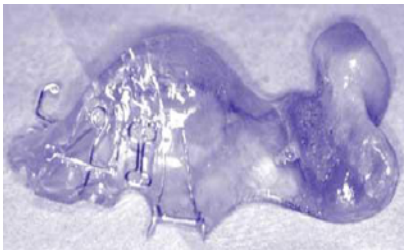


Surgery:

-Pharyngeal flap.
-Sphincter-platoplasty
-Post-pharyngeal wall augmentation.

Prosthetic Devices:

-Palatal lift: to raise the velum when there is poor velar movement (i.e. dysartheria)
-Platal obturator: to occlude an open cleft or fistula
-speech bulb: to occlude nasopharynx



4. Dysarthria:

Definition:

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

Types of dysarthria:

1. Flaccid dysarthria:	2. Spastic dysarthria:	3. Ataxic dysarthria:	4. Dyskinetic dysarthria:	5. Mixed dysarthria:
- Lesion: lower motor neuron level. - Communication: *breathy phonation. *hypernasality.	- Lesion: upper motor neuron level. - Communication: *strained strangled phonation. *labored breathing.	- Lesion: cerebellum level. - Communication: *increased equal stresses. *irregular articulatory breakdown.	- Lesion: basal ganglia level. a.Hypokinetic type (Parkinsonism): * breathy phonation. * rapid rate. * short rushes of speech with final decay. b.Hyperkinetic type: i. Quick hyperkinetic (Chorea):variable rate and loudness. ii. Slow hyperkinetic (Athetosis): slow rate.	- may the most common. - Examples: *Motor neuron disease ➪Flaccid + Spastic. *Multiple sclerosis➪ Ataxic + Spastic. *Wilson's disease➪ Ataxic + Spastic + Hypokinetic.

Assessment of dysarthria:

I.History taking.

II.Physical examination: ... , mouth, palate, ... , neurological exam, ..

III. Investigations:

- Audio recording.
- CT/MRI brain .
- Nasometry.
- Dysphasia test.
- Fiberoptic nasopharyngolaryngoscopy.
- Psychometry (IQ).
  MDVP.
- Articulation test.
- Audiometry.
- Aerodynamics(AerophoneII).

Management of dysarthria:

Individualized:

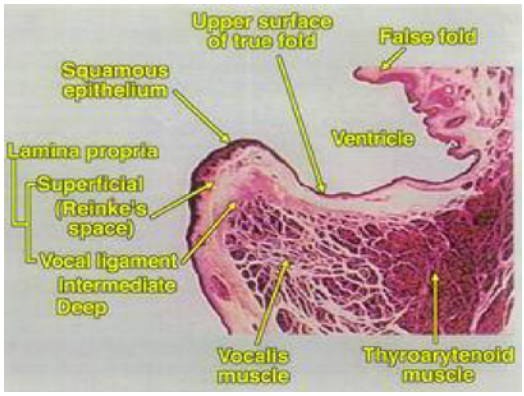
•Management of the cause.

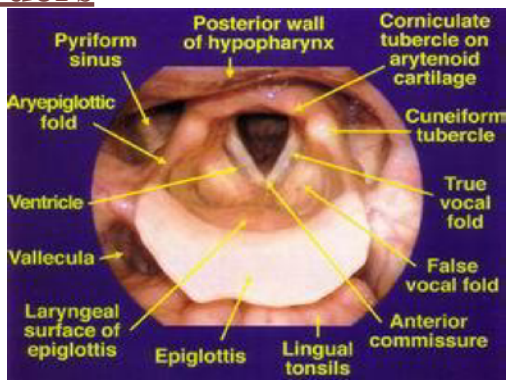
•Patient counseling.

•Communicative therapy: * Articulation. * Phonation. * Resonance. * Respiration. * Prosody.

•Alternative and augmentative communication.

Voice Disorders





Prerequisites of "normal" voice production:

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

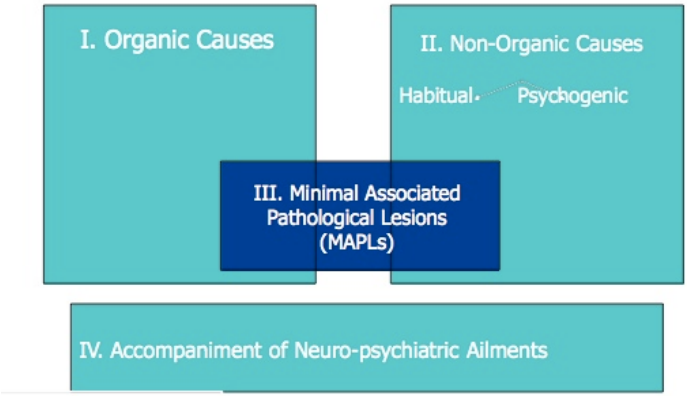
Usually the presenting symptoms in voice disorders are:

A.Dysphonia: Any change of the patient's voice from his habitual one.
B.Aphonia: Loss of the patient's voice (functional or organic).
C.Phonasthenia: a subjective complaint of dryness, tightness, globus feeling and voice fatigue, while the patient's voice and larynx is normal.
D.Dysodia: Change of the singing voice while the speaking voice is normal.

Definition of dysphonia:

- "Difficulty in phonation".
- "Change of voice from his /her habitual".
- "Hoarseness" = roughness & harshness of voice.

Etiological classification of dysphonia:



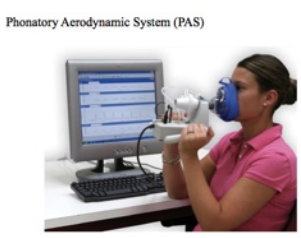
A) Organic voice disorders:

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

B) Non-organic voice disorders:

i. Habitual:

1. Hyperfunctional childhood dysphonia.
2. Incomplete mutation.
3. Phonasthenia (Voice fatigue).
4. Hyperfunctional dysphonia.
5. Hypofunctional dysphonia.
6. Ventricular dysphonia.



ii. Psychogenic:

1- Psychogenic dysphonia.
2- Psychogenic aphonia.

C) Minimal associated pathological lesions (MAPLs) :

1. Vocal fold nodules.
2. Vocal fold polyps.
3. Vocal fold cysts. 4. Reinke's edema.
5. Contact granuloma.

Assessment of dysphonia:

I. History taking.

II. Physical examination: APA , ... , neck , ...

III. Investigations:

- Audio recording.
- Acoustic analysis (MDVP).
- CT neck.
- Digital laryngostroboscopy.
- Aerodynamic analysis (Aerophone II).
- Digital laryngokymography.
- GERD (LPR) work-up.

Management of voice disorders:

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

Swallowing Disorders

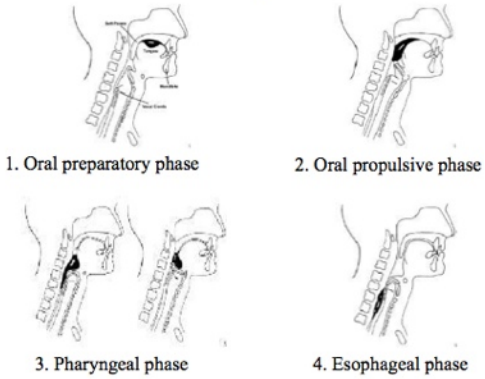
Definition of dysphagia:

- "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.
-Airway obstruction.
-Loss of joy of eating.

Phases of normal swallowing:



Assessment of dysphagia:

I. History taking.	II. Physical examination:	III. Investigations:
	- General examination. - Language and Speech assessment. - Vocal tract examination. - Neck examination. - Trail feeding.	- FEES (Fiberoptic Endoscopic Evaluation of Swallowing.) - VFES (MBS). (Videofluoroscopic Evaluation of Swallowing) - GERD (LPR) work-up.

FEES protocol of evaluation (Langmore, 2003):

I.Anatomic and physiologic assessment.
II.Assessment of food and liquid swallowing.
III. Assessment of theraputic interventions.

Management of dysphagia:

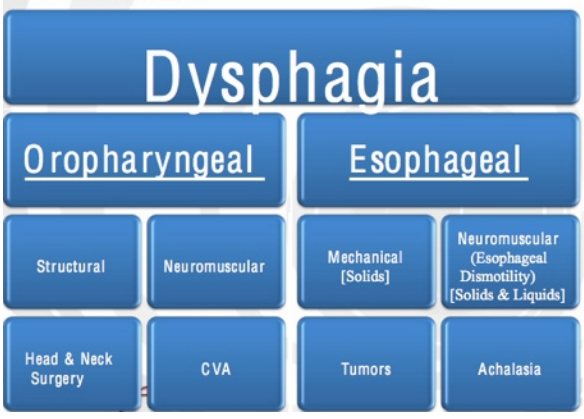
1.Swallowing therapy:
- Diet modification.
- Postural techniques.
- Swallowing maneuvers.
- Sensory enhancement techniques.
- Motor exercises.

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.

FEES

Fiberoptic Endoscopic Evaluation of Swallowing

Causes of dysphagia:



Normal

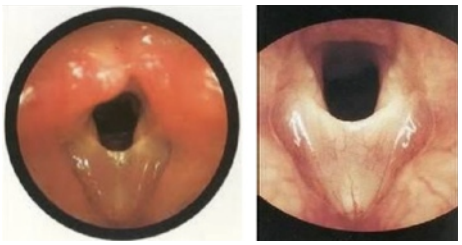
Laryngopharyngeal Reflux

Laryngomalacia:

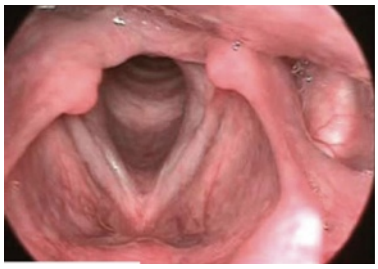
Soft floppy larynx due to softening of the cartilage

Laryngeal Cleft

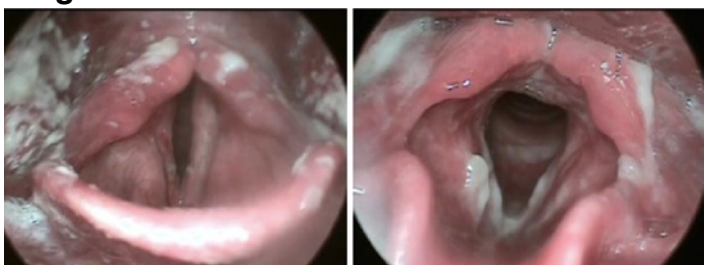
Congenital Vocal Folds Web



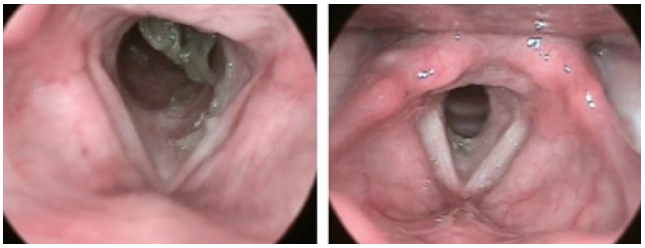
Sulcus Vocalis



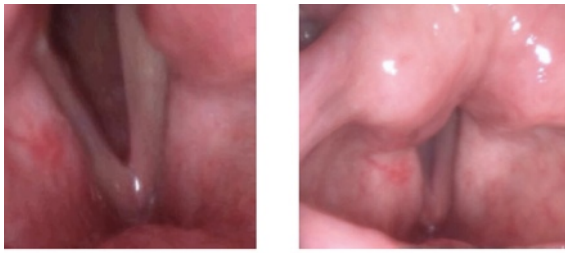
Fungal Infection



Laryngoscleroma

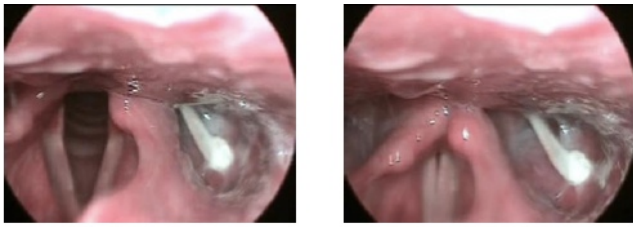


Left Vocal Folds Paralysis



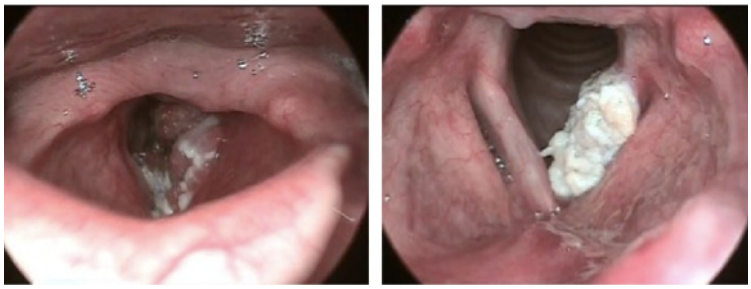
Respiration Phonation

Trauma

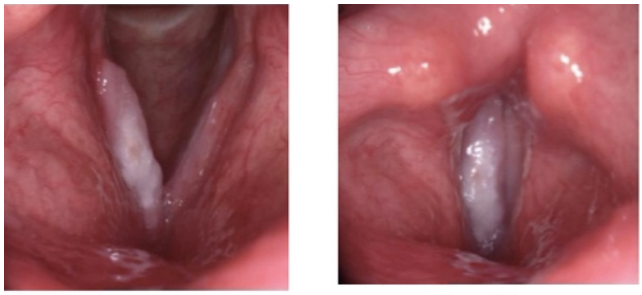


Respiration Phonation

Cancer



Laryngeal Carcinoma



Respiration Phonation

Hyperfunctional dysphonia

Respiration

Phonation

Phonasthenia

Respiration

Phonation

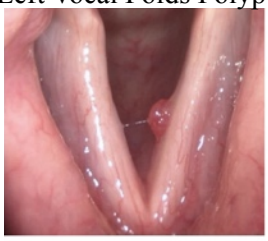
Polyps:

Left vocal folds Polyp with a Reaction

Respiration

Phonation

Left Vocal Folds Polyp



Respiration

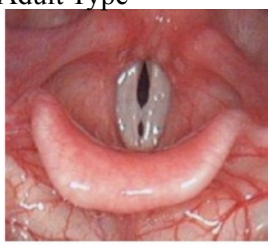
Phonation

Right Vocal Polyp

Nodules:

Vocal Fold Nodules: Adult Type

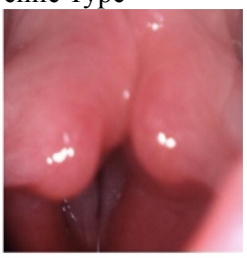
Respiration



Phonation

Vocal Fold Nodules: Juvenile Type

Respiration



Phonation

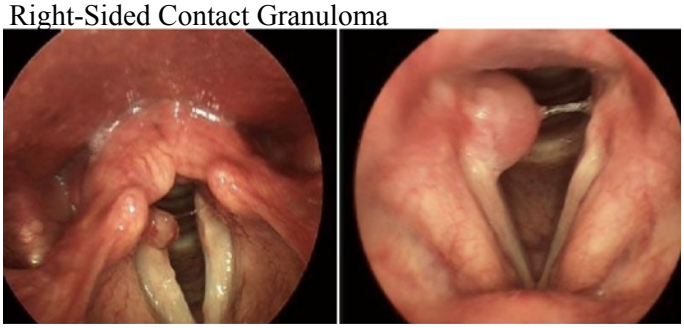
Granulomas

Right-Sided Contact Granuloma

Respiration

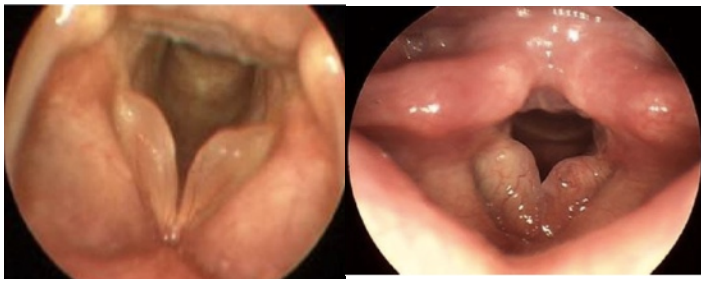
Phonation

Right-Sided Contact Granuloma



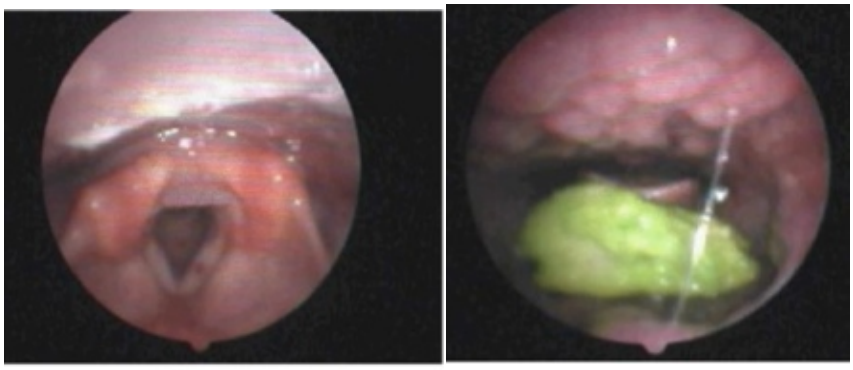
Reinke's Edema

Bilateral

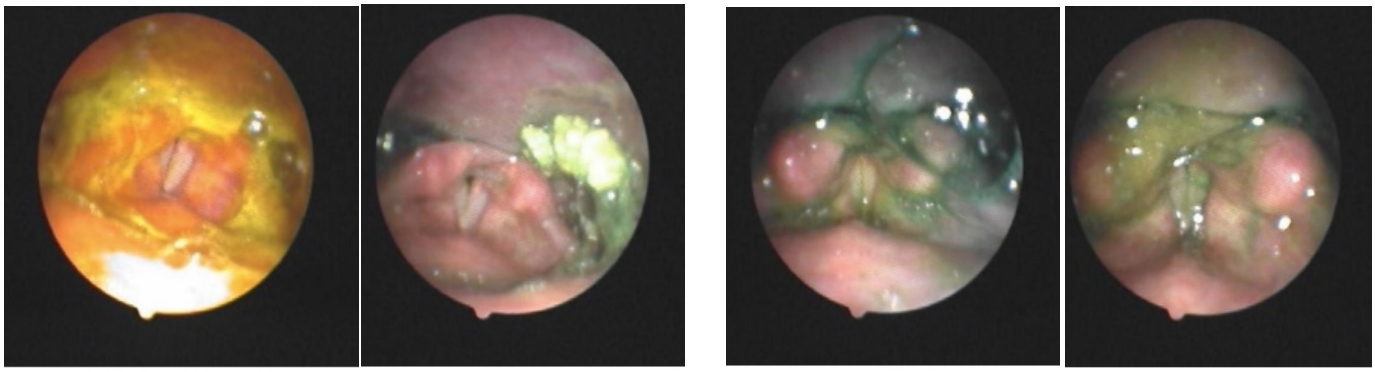


Cysts: Left Vocal Fold Cyst

Normal FEES



NOTE:
Not expected to be on the exam. Take a look at it just to be on the safe side.



Residue Residue Penetration Penetration

Aspiration

VFES (MBS)