



# Communication and Swallowing Disorders I-II

## Objectives:

- To know the main **language** disorders and their management.
- To know the main **speech** disorders and their management.
- To know the main **voice** disorders and their assessment and management.
- To know the main **swallowing** disorders and their assessment and management.

MOST IMPORTANT: VOICE, SWALLOWING, HYPERNASALITY.

**Resources:** Team 436 group A, Doctors Slides.

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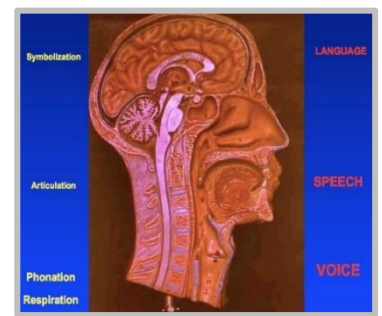
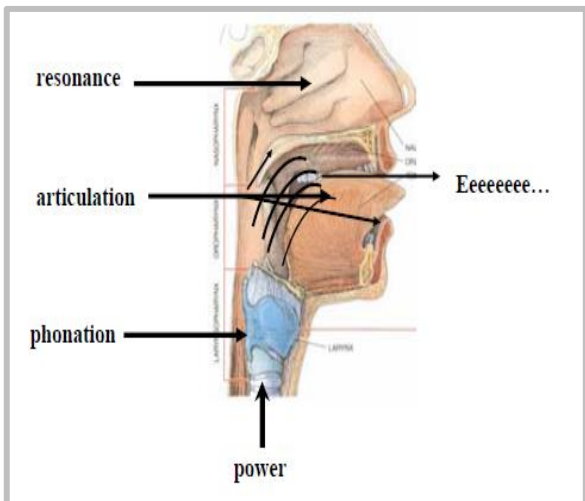
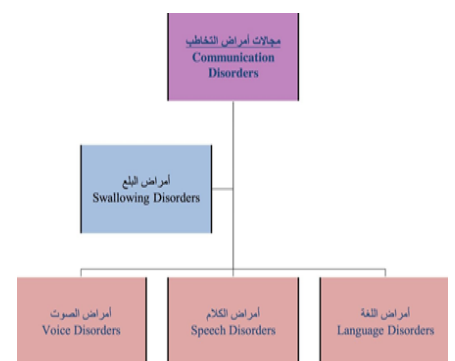
**Revised by:** Shrooq Alsomali

**DEFINITIONS :**

<b>COMMUNICATION</b>	<ul style="list-style-type: none"> <li>Exchange of thoughts, ideas, emotions between two parties Types: 1-Verbal. 2-Non-Verbal.</li> <li>Parts of communication: 1-Voice. 2-Speech. 3-Language. (try to mention them in this order)</li> </ul>
<b>VOICE</b>	<ul style="list-style-type: none"> <li>The result of vibration of the true vocal <b>fol</b>ds using the <b>exp</b>ired air.</li> </ul>
<b>SPEECH (ARTICULATORS)</b>	<ul style="list-style-type: none"> <li>A neuro-muscular process whereby language is uttered.</li> <li>It includes the coordination of respiration, phonation, articulation, resonance and prosody. الحروف والأصوات الواضحة، بطلاقة جيدة وبدون خنة.</li> </ul>
<b>LANGUAGE</b>	<ul style="list-style-type: none"> <li>A symbolic arbitrary system relating sounds to meaning.</li> </ul>
<b>SWALLOWING</b>	<ul style="list-style-type: none"> <li>The process of successful passage of food and drinks from the mouth through pharynx and esophagus into the stomach.</li> </ul>

**HOW COMMUNICATION HAPPENS? VERY IMPORTANT** according to male

- Inspiration → expiration → air passes (**the power**) through sound box (larynx) between the Adducted vocal folds (expiratory phonatory airflow) → vibration of the two vocal folds (not cords!) → voice (primary laryngeal sound) → supralaryngeal compartments (pharynx, epiglottis, tongue, soft palate, teeth, sinuses) for articulators or resonators/speech (they produce a person's recognizable voice) → symbolization by the brain (language).<sup>1</sup>
- Function of supralaryngeal compartments: change of primary laryngeal sound (voice) into secondary sound (speech).
- Disorders of communication can occur in each of the following:
  - o Language
  - o Speech
  - o Voice



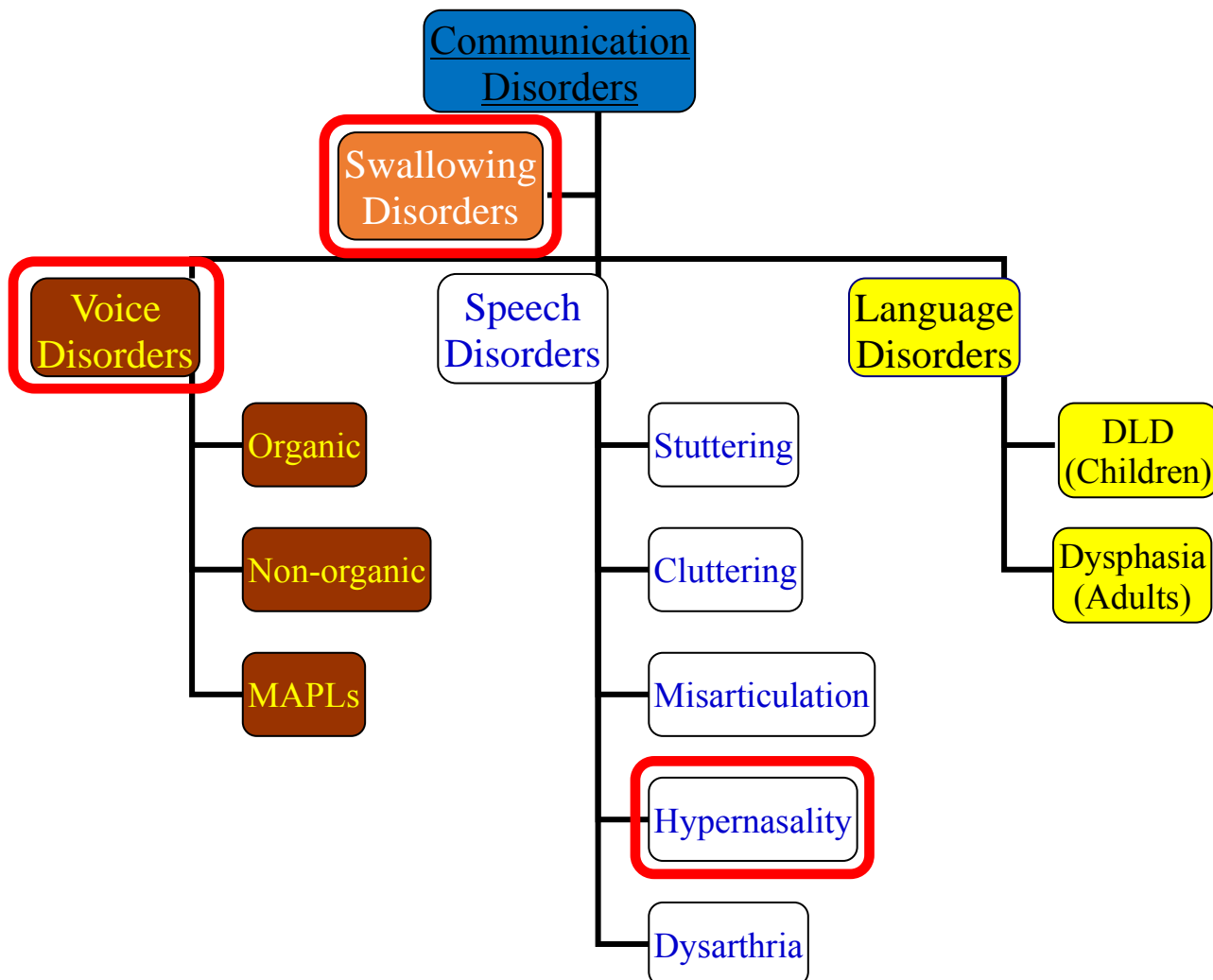
<sup>1</sup> In summary: breathing > Phonation > speech > resonance, then the language from the central system.

## WHO IS MANAGING COMMUNICATION AND SWALLOWING DISORDERS?

### 1. PHONIATRICIANS (MD'S):

- A. A medical specialty that deals with communication and swallowing disorders.
- B. It stems mainly from ORL (ENT), especially when dealing with voice disorders.

### 2. SPEECH-LANGUAGE PATHOLOGIST.



The ones that in red are the most important

## A. LANGUAGE DISORDERS:

❖ **1- Delayed Language Development (DLD):** Language disorders is the most common communication problem here in Saudi Arabia, and DLD the comments among children.

→**DEFINITION:** Delay or failure to acquire language **matched** with age. Ex. 4 yrs. 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.

### 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:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>- <b>2-4 MONTHS;</b> Babbling</li> <li>- <b>6 MONTHS;</b> Vocal play</li> <li>- <b>9 MO-1 YEAR;</b> 1st word</li> <li>- <b>1-1/2 YEARS;</b> 20 words</li> <li>- <b>2 YEARS;</b> 200 words, 2 word sentence.</li> </ul> | <ul style="list-style-type: none"> <li>- <b>3 YEARS;</b> 2000 words, 3 word sentence</li> <li>- <b>4 YEARS;</b> 4 word sentence</li> <li>- <b>5-7 YEARS;</b> Full maturation of all language modalities.</li> </ul> |
|---|---|

### 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. (very important)**
- 435 notes:
  - Babies should say their first word at their 1st year (9 months – 1yr).
  - At their 3 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<sup>2</sup> (opposite of pre-requisites):

### 1. Brain damage.

- Diffuse brain damage (M.R.).
- Localized brain damage with motorly handicapped child (CP).
- **Minimal brain damage (ADHD)**, medication then speech therapy.
- **Cerebral palsy (CP)**, hypoxia or trauma during delivery.

### 2. Sensory deprivation.

- **HEARING IMPAIRMENT**: conductive, sensory-neural, mixed, central auditory processing disorder.
- VISUAL IMPAIRMENT.

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

### 4. Environmental deprivation<sup>3</sup> (Non-stimulating environment): Lonely child, first and last child.

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

## →ASSESSMENT OF DLD:

### 1. History taking.

### 2. Physical Examination of articulators.

### 3. Investigations:

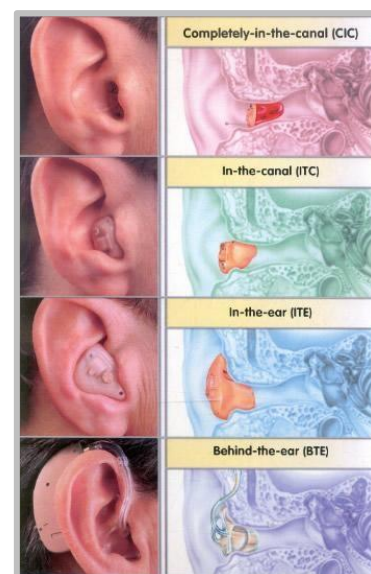
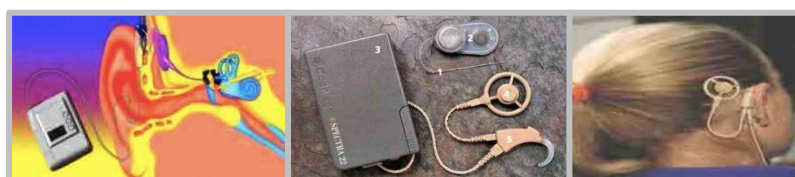
- Psychometry (IQ).
- Audiometry.
- DLD sheet
- Brian Imaging.
- EEG.
- Ophthalmological consultation.

## →management of DLD:

- **Early detection.** (the earlier the better the prognosis)
- Providing the suitable aid:
  - **hearing (HA or CI)<sup>4</sup>.**      - visual aid.      – physiotherapy.
- family counseling.
- Direct language therapy (individual- group).
- Medications (autism and ADHD).

## →OSCE Stop:

- What is this device called?
  - COCHLEAR IMPLANT
- What are the indications for CI?
  - BILATERAL SEVERE TO PROFOUND SENSORINEURAL HEARING LOSS.



<sup>2</sup> First step after diagnosing a child with DLD is to look for the CAUSE

<sup>3</sup> It's very common cause

<sup>4</sup> What's the different (when to use Hearing aid and when to use Cochlear implant)? Always **HA** is better, but if the child is having Bilateral severe to profound sensorineural hearing loss **CI** is needed.

## ❖ 2- DYSPHASIA:

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

→ Full development of speech:

- Females: 7.5 years (more stutter)
- Males: 8 years

→ **ETIOLOGY:**

- 1-CVA. 2-Neoplastic. 3- Traumatic. 4-Inflammatory. 5- Degenerative. 6- Metabolic.  
7-POISONING. 8- RTA

### → TYPES OF DYSPHASIA:

- Expressive:(e.g. Broca's aphasia) Understands but cannot speak, very traumatic psychologically. (better prognosis).
- Receptive: Can speak but he doesn't understand.
- Mixed predominantly expressive.
- Mixed Predominantly Receptive.
- Global. (most severe)

Mixed types are more common.

### ❖ 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.

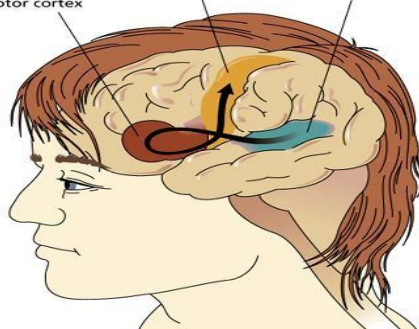
#### 3. INVESTIGATIONS:

- CT / MRI brain.
- Psychometry (IQ).
- Dysphasia test.
- Audiometry.

### →MANAGEMENT:

- **Treat the cause.** If tumor, if HTN causing Hemorrhage. etc.
- **Physical rehabilitation (Physiotherapy).**
- **Family counseling.** They have big role! If isolated, the problem will deteriorate.
- **Language therapy.**
- Alternative and augmentative communication: cards, sign boards. In mixed or sever Aphasia.

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## B-SPEECH DISORDERS:

### 1- DYSLALIA (MISARTICULATION):

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

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

**A. SIGMATISM (/S/ DEFECT):** سبورة

- Interdental stigmatism ثبورة
- Lateral astigmatism شبورة
- Pharyngeal stigmatism خبورة

**B. ROTACISM (/R/ DEFECT)<sup>5</sup>:** ريما: غيما = ويما = ليما = بيما

**C. BACK-TO-FRONT DYSLALIA:** كورة

- /k/ → /t/ تورة - /g/ → /d/

**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.
- Psychometry (IQ).
- Articulation test.
- Audiometry.

→ **MANAGEMENT:**

**A. TREATMENT OF THE CAUSE:**

- **Tongue tie<sup>6</sup>** (prevents elevation of the tongue, can't say **La**). RX: by cutting the frenulum.
- Dental anomalies (open bite).
- Hearing.
- Dyslalia sheet.

**B. SPEECH THERAPY** with assistance and counseling. Most cases treated this way and it very helpful  
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### 2- STUTTERING: تأتأة أو تلعثم

→ **DEFINITION:** The **intra phonemic disruptions** resulting in sound and syllable **repetitions** أأأأحمد، sound **prolongations**<sup>7</sup> أأأأحمد (first sound or whole word is prolonged), and **blocks**. Worst prognosis (MCQ!)

→ **TYPES:**

- Prolongation
- Repetitions
- Blocking

\*Most important problem facing children with stuttering is the **avoidance**: يبدأ الطفل يتجنب المشاركة والتحدث ويصير كل أحد يتجنبه وهذا من أكثر الأشياء إلي يزيد المشكلة سوء.

<sup>5</sup> ينطق الـ "ر" بـ "ر" و "ا" و "ي"

<sup>6</sup> 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'. Or due to short frenulum the child can't elevate the tongue > problem in ر & ل.

<sup>7</sup> The longer the more sever.

- **NORMAL DISFLUENCY:** هنا اسمها عدم طلاقة طبيعية يعني ممكن تعدي بدون مشاكل، ولكن الطفل عرضة للتلعثم
  - **Less than 6 years** - **Only repetitions**<sup>8</sup>. - **No associated muscular activity.** - **Not aware**<sup>9</sup>.
- **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. (more shy)

→**THEORIES OF STUTTERING:** The exact cause is unknown. Although the cause it's not psychological, but this problem has a psychological impact.

- ✓ Organic/Genetic theory
- ✓ Neurosis theory.
- ✓ Learning theory.

#### →ASSESSMENT OF STUTTERING:

##### 1. HISTORY TAKING.

##### 2. PHYSICAL EXAMINATION

##### 3. INVESTIGATIONS:

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

#### →AUDITORY PERCEPTUAL ANALYSIS (APA)

##### 1. CORE BEHAVIORS:

- Intrapophonemic disruption.
- Repetitions.
- Prolongations.
- Blocks.

##### 2. SECONDARY REACTIONS

- Muscular activity and struggle (tremors)
- Word substitutions and circumlocution
- Interjection

##### 3. CONCOMITANT REACTIONS:

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

→**MANAGEMENT:** The only treatment till now is speech therapy جلسات علاجية

##### 1. Family and patient counseling.

##### 2. Speech therapy: يكون فيها تعويد للطفل على إبطاء سرعة الكلام + التحكم في النفس...

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

**3- CLUTTERING:** Is a fluency disorder characterized by a **rapid** and/or irregular speaking rate, excessive disfluencies. Rx: first by making the person aware of this problem.

<sup>8</sup> Repetitions only with no prolongation or block + Repeating only the syllable or the words NOT the sound

<sup>9</sup> الطفل ما يشعر إن عنده هذي المشكلة. وخطأ كبير تنبيه الطفل أو لفت انتباهه إن عنده هذي المشكلة + لا تقولو له ليش تتكلم كذا أو وقف خذ نفس X الطريقة الصحيحة للتعامل هو إن كل أفراد الأسرة يتكلموا مع الطفل أو قدامه بطريقة بطيئة وهادية وتحفيزه ✓

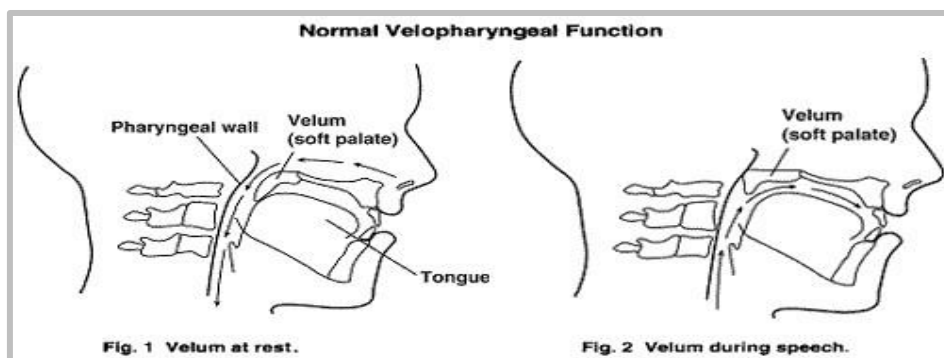


#### 4- **HYPERNASALITY**<sup>10</sup>: **IMP**

##### → 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 (closed nasality) e.g. **common cold**, polyp, deviated septum adenoid, chronic sinusitis. (M becomes B) (مع الزكمة). Not relating to us.
- **Hypernasality**<sup>11</sup> → soft palate open (open nasality) → velopharyngeal dysfunction (VPD).



##### → ETIOLOGY:

Organic	Non-organic
<p><b>1. Structural</b></p> <p><b>a. Congenital:</b></p> <ul style="list-style-type: none"> <li>- <b>Overt cleft palate</b><sup>12</sup>.</li> <li>- <b>Submucous cleft palate.</b></li> <li>- Non-cleft causes:           <ul style="list-style-type: none"> <li>· Congenital short palate.</li> <li>· Congenital deep pharynx.</li> </ul> </li> </ul> <p><b>b. Acquired:</b></p> <ul style="list-style-type: none"> <li>- Palatal trauma</li> <li>- Tumors of the palate and pharynx</li> <li>- Adenotonsillectomy</li> </ul> <p>2-4 weeks =&gt; temporary (pain=&gt; decrease movement=&gt; more inx are needed if it exceeds 4 weeks&gt; surgical error)</p> <p><b>Neurogenic: (VP Incompetence)</b></p> <ul style="list-style-type: none"> <li>- Palatal U motor neuron lesion.</li> <li>- Palatal L motor neuron lesion.</li> </ul>	<ul style="list-style-type: none"> <li>• Faulty speech habits.</li> <li>• Mental retardation.</li> <li>• Neurosis or hysteria.</li> <li>• Hearing impairment.</li> <li>• post-tonsillectomy pain. (transient)</li> </ul>

<sup>10</sup> كل أصوات الحروف تطلع من الفم باستثناء 3 أحرف: (إن) (إم) (انغ=منجا)

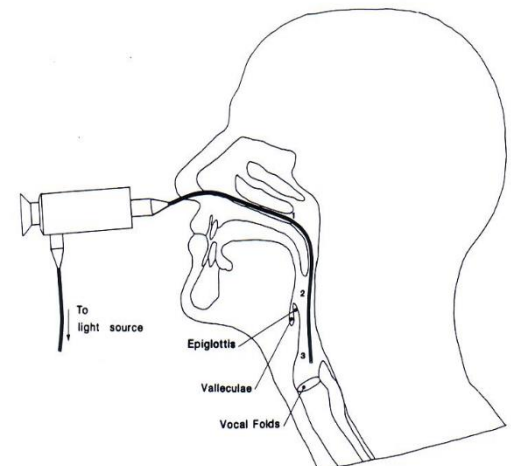
<sup>11</sup> Normal sounds go with the mouth started to be contaminated with nasal tone.

<sup>12</sup> Most important problem facing baby with cleft palate is **breast feeding**, other problems like the effect on hearing, otitis media, cosmetic and **hypernasality** for course :)

### → EFFECTS OF VPD:

- **Feeding problems:** nasal regurgitation.
- **Psychosocial problems.**
- **Communicative problems:**
  - Speech: hypernasality.
  - Language: DLD.
  - Voice: hyper or hypofunction.

Assessing all three position, starting from soft palate and pharyngeal walls.



### → ASSESSMENT OF HYPERNASALITY (VPD):

- I. History taking. Trauma, cleft abnormality...
- II. Physical examination:
  - General.
  - ENT examination: palate (inspection, palpation).
  - Simple test:
    - Gutzman's (a/i) test.
    - Czermak's (cold mirror) test.
- III. Investigation:
  - Audio recording.
  - **Fiberoptic Nasopharyngolaryngoscopy<sup>13</sup>.**
  - Psychometry (IQ).
  - Audiometry.
  - Articulation test.
  - Nasometry.
  - Hypernasality sheet.



### → MANAGEMENT:

- Teamwork - Feeding - Hearing - Maxillofacial - Palatal and lip surgeries - Obturators.
- Communication (Phoniatic intervention):
  - Language: Language therapy.
  - Speech: Speech therapy
  - Voice: Voice therapy.
- Family counseling.

### → 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.

<sup>13</sup> The better way to evaluate is through Endoscopy, but it's better to be through the **Nose** not the mouth, why? To asses from the beginning and not missing the soft palate (like if it done through the mouth)

→ **PROSTHETIC DEVICE:** (for elderly)

- 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: (important > according to male)

Difficult to diagnose >triad:

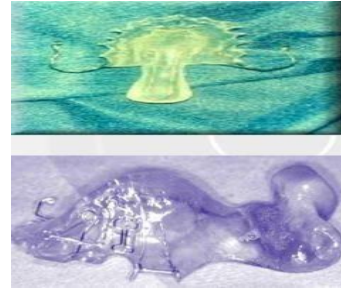
■Contraindicated to adenoidectomy

>Hypernasality.

■Post nasal notch (instead of spine).

■Bluish central line in soft palate.

■Bifid uvula.



**5- DYSARTHRIA:** (neurological problems in speech)

→ **DEFINITION:**

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

→ **TYPES OF DYSARTHRIA:** only know the types

Type	1- FLACCID	2- SPASTIC <sup>14</sup>	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 <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

→ **ASSESSMENT OF DYSARTHRIA:**

- **HISTORY TAKING.**
- **PHYSICAL EXAMINATION:** mouth, palate, neurological exam.
- **INVESTIGATIONS:**

<sup>14</sup> Can't control the muscles of speech very well.

- Audio recording.
- MDVP.
- CT/MRI brain.
- Dysphasia test. Dysarthria can come with dysphasia

- Psychometry (IQ).
- Audiometry.
- Nasometry.
- Fiberoptic nasopharyngolaryngoscopy.
- Aerodynamics (Aerophone II).

### → MANAGEMENT OF DYSPARTHRIA:

#### ❖ INDIVIDUALIZED:

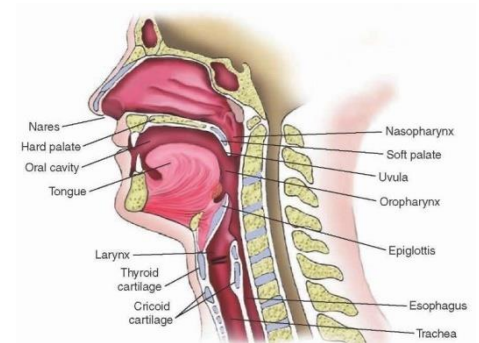
1. Management of the cause.
2. Patient counseling and speech therapy.
3. Communicative therapy:
  - Articulation.
  - Phonation.
  - Resonance.

- Respiration.
- Prosody.

### 4-ALTERNATIVE AND AUGMENTATIVE COMMUNICATION<sup>15</sup>.

## 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.).



### → Functions of the larynx:

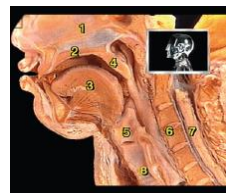
- Airway<sup>16</sup>.
- Protection<sup>17</sup>.
- Phonation.
- Increasing intrathoracic pressure.



### True vocal cord movement:

→ During breathing (**Abduction**)

→ During Phonation (**Adduction**)



### → USUALLY THE PRESENTING SYMPTOMS IN VOICE DISORDERS ARE:

#### - Dysphonia:

- Difficulty in phonation
- Hoarseness: roughness & harshness of voice. Objective term. Dysphonia is broader (includes high pitched)
- Change patient’s voice from his/her habitual

<sup>15</sup> We offer this method in some cases where the patient is having **Anarthria**, (he understands and able to write but can't talk).

<sup>16</sup> The most important function of focal folds. If paralysed in adducted position patient may die!

Breathing (Airway) is the only function that need the vocal folds to be abducted.

<sup>17</sup> From what we eat every day to not enter the airway.

-**Aphonia**: Loss of the patient's voice (functional or organic).

-**Phonasthenia**: voice fatigue.

- **Phonasthenia**: a subjective complaint of dryness, tightness, globus feeling and voice fatigue, while the patient's voice and larynx is normal.

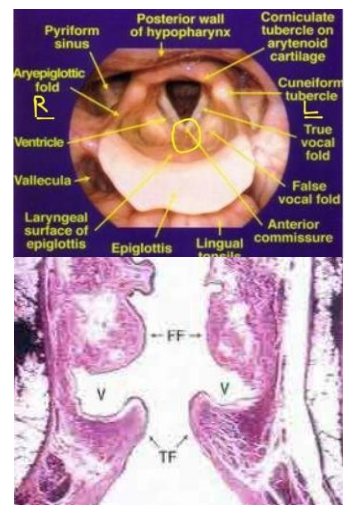
- **Dysodia**: Change of the singing voice while the speaking voice is normal.

→ **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.

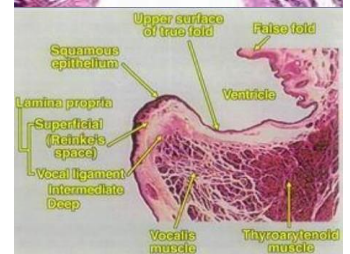
How to know **Right from Left**? By the **Anterior commissure** (no posterior commissure), so in the first picture the patient is facing us.



→ **CROSS SECTION OF THE VOCAL CORDS WHICH CONTAINS:**

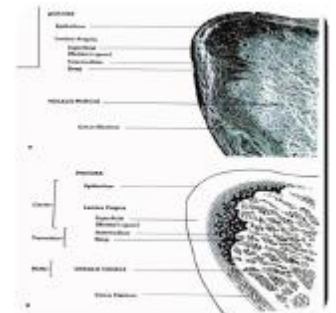
Mucosa:

1. Squamous epithelium
2. Lamina propria which contains:
  - Superficial layer.
  - The intermediate and deep layers (vocal ligament).



→ **Etiology of dysphonia:**

1. **Organic**: there is clear seen pathology.
2. **Non-organic (normal Phx)**: no clear seen pathology, but there is complaint.
3. **Benign focal cord lesion**
4. **Accompaniment of Neuro-psychiatric Ailments**



→ **1- ORGANIC VOICE DISORDERS:**

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

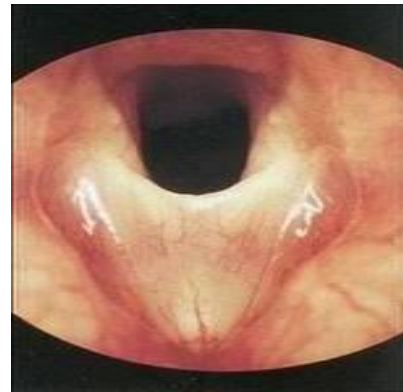
1- Normal



2- Laryngomalacia



3- Congenital vocal folds web



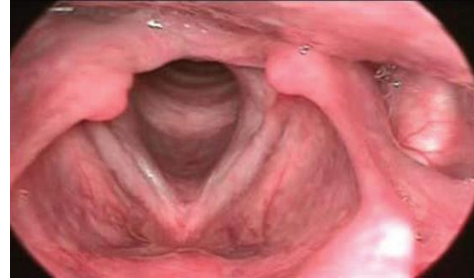
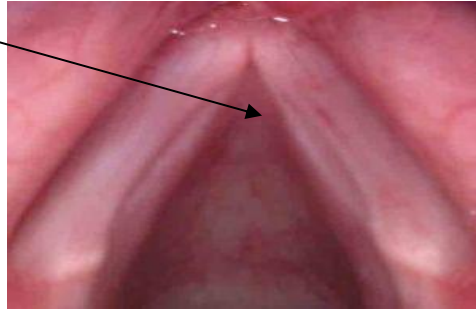
4- Laryngeal cleft





### 5- Sulcus vocalis (bilateral groove)

- Congenital lesion
- (On the free edge of the true vocal fold)
- treated by: vocal folds injection (filler)



### 6- Laryngopharyngeal Reflux



### 7- Fungal infection



## 8- Laryngoscleroma



## 9- Laryngeal carcinoma:

Whitish lesion occupying the full length of the right true vocal fold.

Squamous cell carcinoma is the most common.

Risk factors: Tobacco use, Excessive ethanol use, Infection with human papillomavirus, Increasing age.



Respiration

Phonation

## 10- Cancer





### 11- Left vocal cord paralysis

Left vs right? left true vocal cord **immobility** (don't describe it as paralysis, because the diagnosis could be something else).

1-Determine anatomical landmarks (anterior and posterior) to know which side is left and which is right  
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.

You cannot determine which cord is paralyzed if you don't know if the picture is during inspiration or phonation.

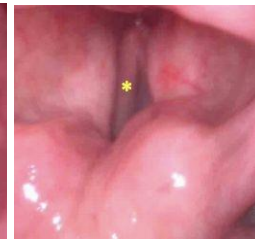
How it presents?

Dysphonia- aspiration (if unilateral)

Airway obstruction - swallowing abnormality (if bilateral)



Respiration



Phonation

### 12- Trauma



Respiration



Phonation

## → 2- NON-ORGANIC VOICE DISORDERS: (normal anatomy, medical treatment)

### 1. HABITUAL:

- a. Hyperfunctional childhood dysphonia.
- b. Incomplete mutation.
  - i. 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.
  - i. Misuse of voice will cause the ventricles to hypertrophy until they touch each other and dysphonia will occur (patient will sound like WWE fighter).
  - ii. Normal function of ventricle: -Helps shape the cords -holds glands which decrease friction between false and true vocal cords -fine tuning.

### 2. 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><b>1- Hyperfunctional dysphonia</b> In professional voice users</p>	 <p style="text-align: center;"><b>Respiration      Phonation</b></p>
<p><b>2- Phonasthenia</b> Most common E.g. Teacher can't talk after 5th period (fatigue) إجهاد صوتي</p>	 <p style="text-align: center;"><b>Respiration      Phonation</b></p>

→ 3- BENIGN VOCAL CORD LESIONS: (Minimal associated pathological lesions (MAPLs))

All are very Important with their management

1- Vocal fold nodule (Bilateral and symmetrical).	
<p style="text-align: center;">Juvenile type Kissing nodules</p> <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>Respiration</p> <p>Phonation</p> </div>	<p style="text-align: center;">Adult type</p> <p><u>Describe:</u> <b>Bilateral nearly symmetrical</b> vocal cords lesions at junction of anterior 1/3 and posterior 2/3.</p> <p><u>Presenting complaint:</u> dysphonia or hoarseness</p> <p><u>Causes:</u> phono-trauma, voice misuse and abuse, shouting.</p> <p><u>Treatment</u><sup>18</sup>: <b>voice therapy</b> and vocal hygiene advices<sup>19</sup>.</p> <p>More common in female adult and male children, very rare in adult male.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>Respiration</p> <p>Phonation</p> </div> <div style="text-align: center; margin-top: 10px;">  </div> <p><u>Glottal gap</u>, due to facing of both nodules.</p>

<sup>18</sup> Sometimes when the nodules are grossly asymmetrical or fibrotic we may treat surgically.

<sup>19</sup> Advices to prevent recurrence.

## 2- Vocal fold polyp (different shapes)

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 during phonation)



Respiration

Phonation

### Left true vocal fold polyp

Describe: **unilateral** vocal fold mass or lesion at  
the left side in the middle third protruding  
medially.

Presenting complaint: dysphonia or  
hoarseness

Causes: phono-trauma, voice abuse and sudden  
shouting.

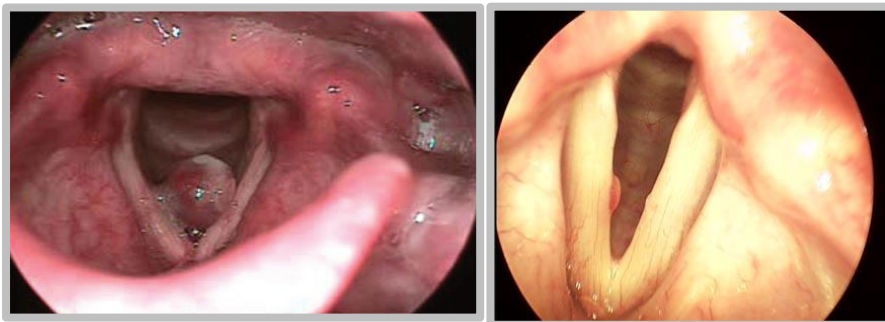
Treatment: Mainly surgical excision and voice  
therapy.



Respiration

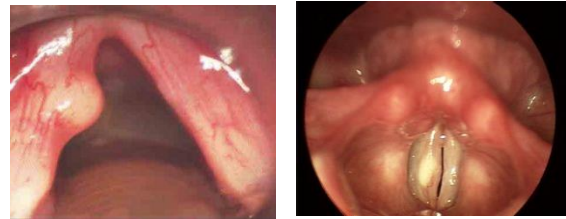
Phonation

### Right vocal fold polyp



### 3- Vocal fold cyst

Arises from deeper layers → ill defined



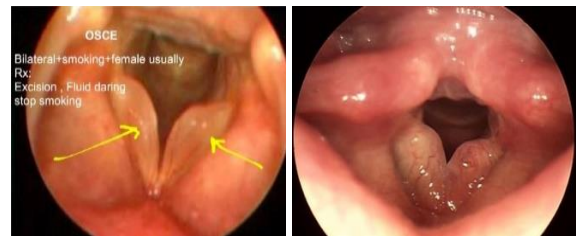
Causes: phono-trauma, congenital, duct closure voice abuse.

Treatment: primary management Surgery. We can differentiate between the polyp and the cyst by the outer mucosa, in the polyp is changing, reddish and hemorrhagic.

### 4- Reinke's edema – Usually bilateral.



Right-sided Reinke's edema



Causes: smoking, laryngopharyngeal reflex, voice abuse.

Treatment: stop smoking and surgical removal. Common amongst middle aged female smokers but also in male.

### 5- Contact granuloma

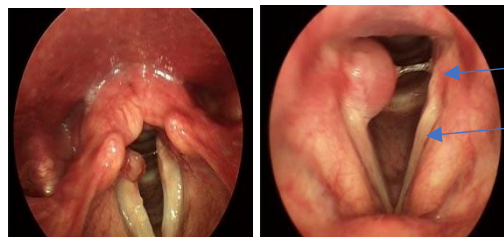
Right-sided Contact Granuloma



Respiration

Phonation

Right-sided Contact Granuloma



Cartilaginous part.

Membranous part.

Unilateral swelling in the Cartilaginous part.

Two types: 1- intubation granuloma 2- contact granuloma (due to reflex).



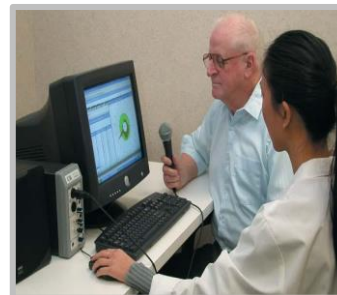
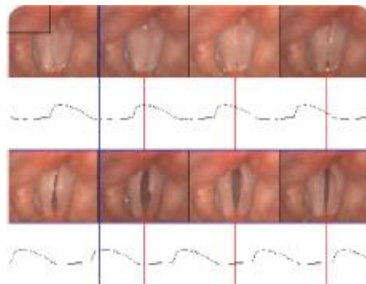
- Causes: **Laryngopharyngeal reflex**, After intubation.
- Presenting complaint: **pain** or **discomfort** but rarely dysphonia unless very large.
- Treatment: Treat the cause (the reflex), voice therapy, surgery only<sup>20</sup> if failed medical treatment or increasing in size.
- Why not polyp? It's in the posterior part (**Usual place for a granuloma**).
- It is very similar to polyps but differ in location, here it involves the posterior cartilaginous part which does not vibrate, therefore no dysphonia.

### → ASSESSMENT OF DYSPHONIA:

- History taking.
- Physical examination: APA, neck
- Investigations:
  - Audio recording.
  - Digital laryngostroboscopy.
  - Digital laryngo kymography.
  - Acoustic analysis (MDVP).
  - Aerodynamic analysis (Aerophone II).
  - GERD (LPR) work-up.
  - CT neck.
  - Voice sheet
  - **CSL**=Acoustic analysis of voice, intensity and frequency (Quantities).



Stroboscopic Examination



Computerized speech lab. (CSL)



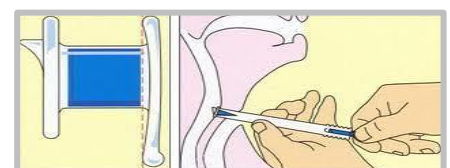
Phonatory Aerodynamic System (PAS)

### → MANAGEMENT OF VOICE DISORDERS:

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



Tracheo-esophageal puncture

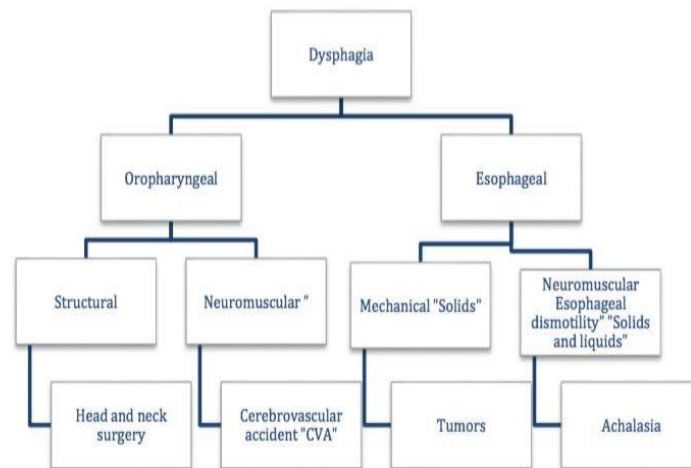


<sup>20</sup> Due to high recurrence rate with the surgery.

★ **Stroboscope:** (it only takes samples) There is a HIGH-SPEED TYPE that is more detailed.

- It is a special method used to visualize vocal fold vibration, because we can't see the high-speed vocal folds vibrations with naked eyes or original endoscopy.
  - 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. up to 1000.
  - ✓ Males reach 120-130 cycle/ sec. up to 200.

## SWALLOWING DISORDERS:



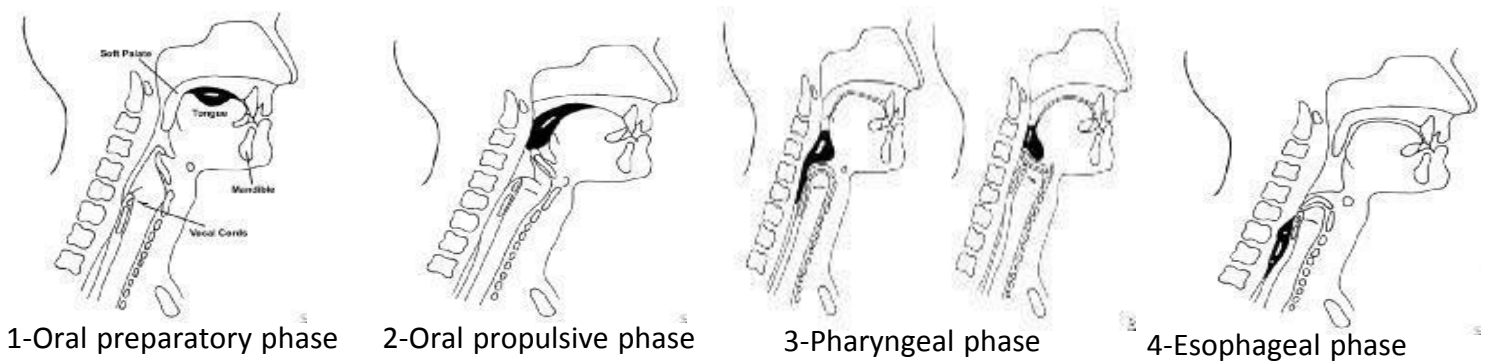
In ENT, they are concerned about the **oropharyngeal** causes.

### → 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:** difficulty in moving food from the mouth to the stomach (pain, discomfort and/or difficulty in initiation or completing the act of swallowing)
- **ODYNOPHAGIA:** painful swallowing due to a disorder of the esophagus.

### → PHASES OF SWALLOWING:

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



### → CONSEQUENCES OF DYSPHAGIA:

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

**Phases of swallowing:** The first two stages are voluntary. The second two stages are involuntary. Most dangerous and crucial stage is the pharyngeal stage because of the airway. In pharyngeal stage, three things:  
 1- the larynx goes up and anterior and closes the vocal folds.  
 2- Soft palate closes.  
 3- Pharynx contract and the upper esophageal sphincter opens.



## → ASSESSMENT OF DYSPHAGIA:

### – HISTORY TAKING.

### – Physical examination:

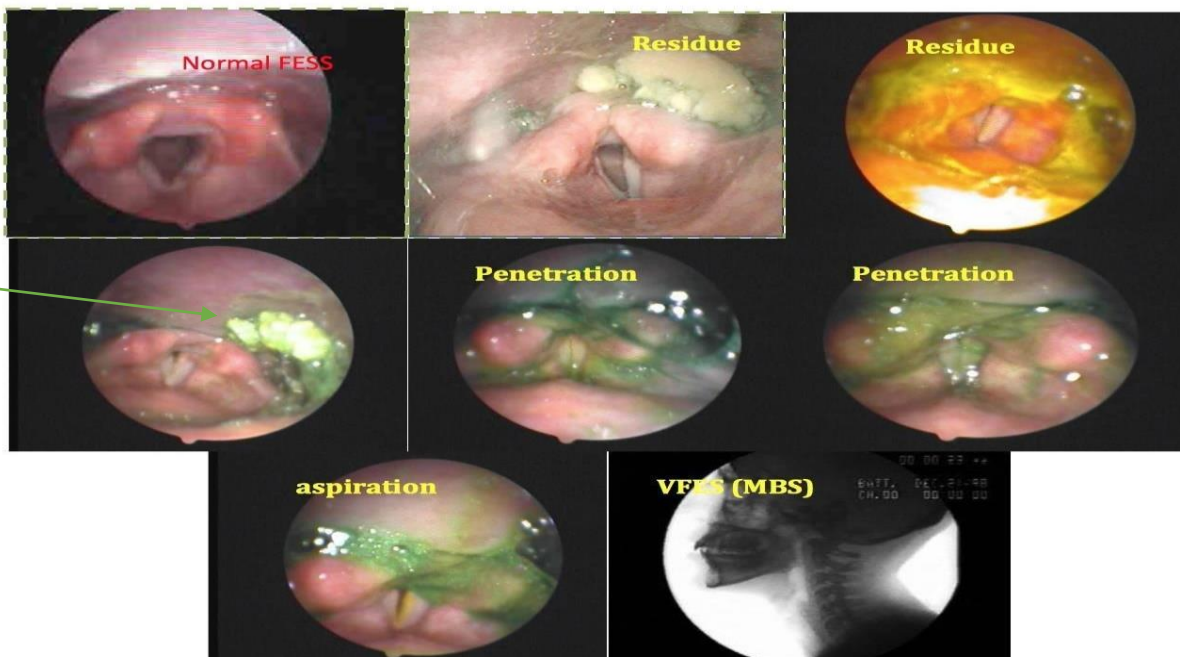
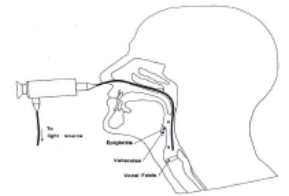
- General examination
- Language and speech assessment
- Vocal tract examination
- Neck examination
- Trail feeding. Patient is given water, if they cough, that indicates aspiration.
- Dysphagia sheet

### – Investigations:

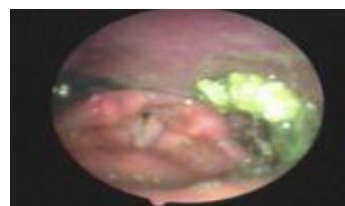
- FEES<sup>21</sup> “Fiberoptic endoscopic evaluation of swallowing” (Endoscopy)
- VFES<sup>22</sup> (MBS) “Video fluoroscopic evaluation of swallowing” (Modified barium swallow) (Radiology)
- GERD (LPR) workup
- FEES protocol of evaluation (Langmore, 2003):
  - Anatomic and physiologic assessment.
  - Assessment of food and liquid swallowing.
  - Assessment of therapeutic interventions.



**FEES**



**Residue:**  
Food stuck in one side (left), that's mean there is paralysis in this side.



Food stuck in the pyriform fossa (site of constriction).

<sup>21</sup> Through the nose, enter to three positions: 1- to see soft palate movement 2- to see pharynx & larynx mov. 3 to see vocal folds mov. and if there is aspiration or not.

<sup>22</sup> The advantage of VFES over FEES is that it can evaluate the all 4 stages of swallowing. I can easily miss oral and oesophageal stages in FEES. **Important**

- **Residue** = in the pharynx, **Penetration**= at the true vocal folds, **Aspiration**=below vocal folds.
- Normally when drinks or food enters the airway there is cough reflex, but if for e.g. an old age patient with CVA or stroke and the fluids enter the airway and no cough reflex, this is called **Silent Aspiration** which is very dangerous.
- 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:

### 1. SWALLOWING THERAPY:

- Diet modification. E.g. Dysphagia with water? Try make it thicker > juice.
- Postural techniques. E.g. Head turning to right or Head down to protect airway.
- Swallowing maneuvers. E.g. Take breath > swallow > cough: In case of silent aspiration.
- Sensory enhancement techniques. Stimulation of pharynx with something cold.
- Motor exercises. Mouth or jaw
- Bolus control cup<sup>23</sup>

### 2. SURGICAL TREATMENT, e.g. medialization laryngoplasty (in case of unilateral focal fold paralysis).

### 3. MEDICAL (DRUG) TREATMENT, e.g. anti-parkinsonism drugs.

### 4. INTRAORAL PROSTHESIS.

### 5. ALTERNATIVE ROUTES OF FEEDING, e.g. NG tube feeding.

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

- **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.

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<sup>23</sup> (Dysphagia cups) are a style of adapted drinking cups that are designed for individuals who have problems swallowing safely.