كرسي بحث
أمراض الصوت والبلع والتخاطب

جامعة الملك سعود
King Saud University
كلية الطب
كرسي بحث أمراض الصوت والبلع والتخاطب

Communication and Swallowing Disorders

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Objectives :

1. Describe the basic anatomy, and physiology related to communication and swallowing disorders.

2. List main causes and clinical picture for common communication and swallowing disorders.

3. Describe common investigations related to communication and swallowing disorders.

4. Integrate the data obtained from collected symptoms, signs and investigations into a meaningful diagnosis and construct appropriate management strategies.

5. To identify emerging roles of artificial intelligence in the assessment and management of communication and swallowing disorders.

Symbolization

Articulation

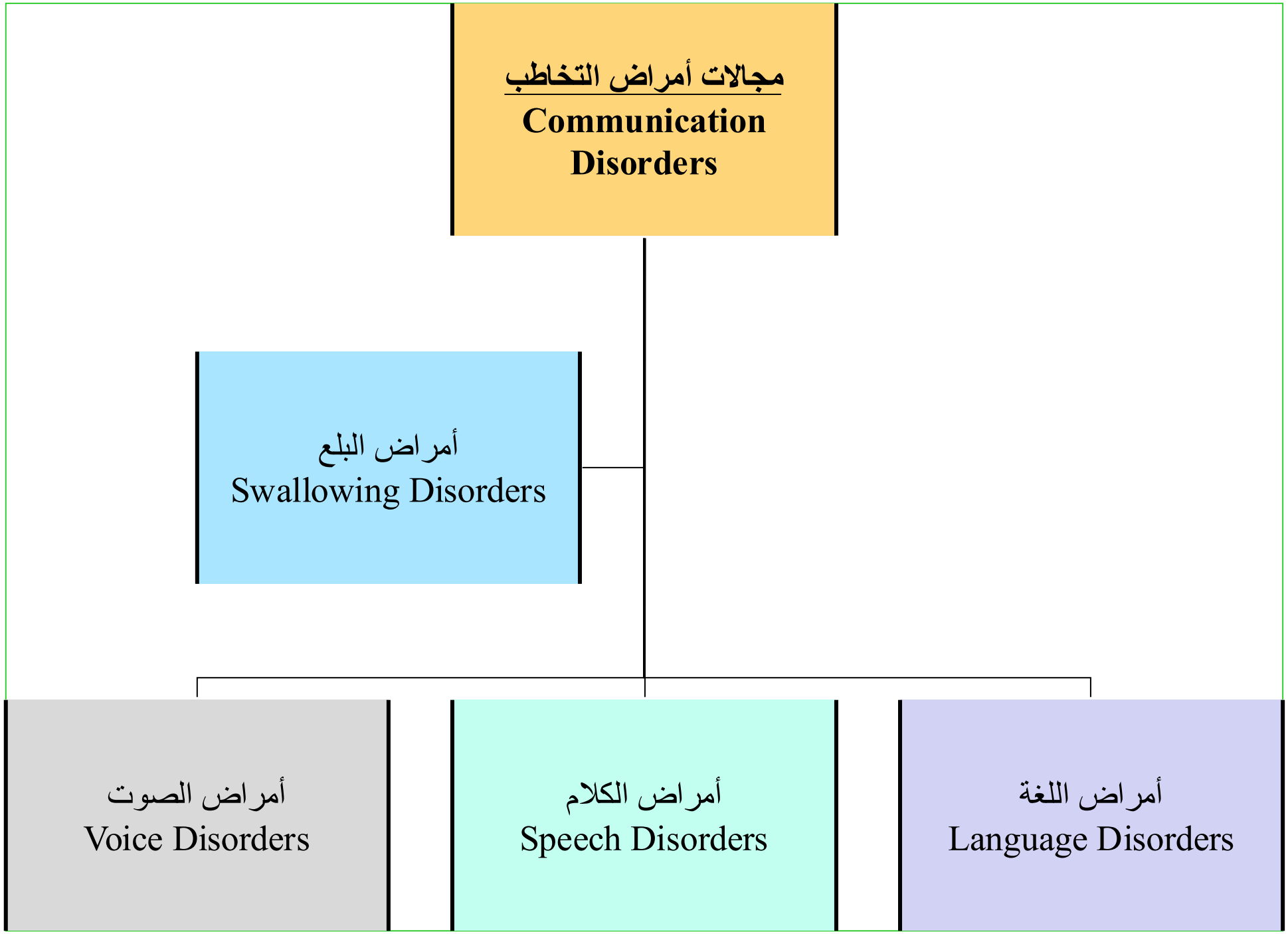
Phonation

Respiration

LANGUAGE

SPEECH

VOICE


مجالات أمراض التخاطب
Communication Disorders
أمراض البلع
Swallowing Disorders
أمراض الصوت
Voice Disorders
أمراض الكلام
Speech Disorders
أمراض اللغة
Language Disorders

Language

A symbolic arbitrary system relating sounds to meaning.

Speech

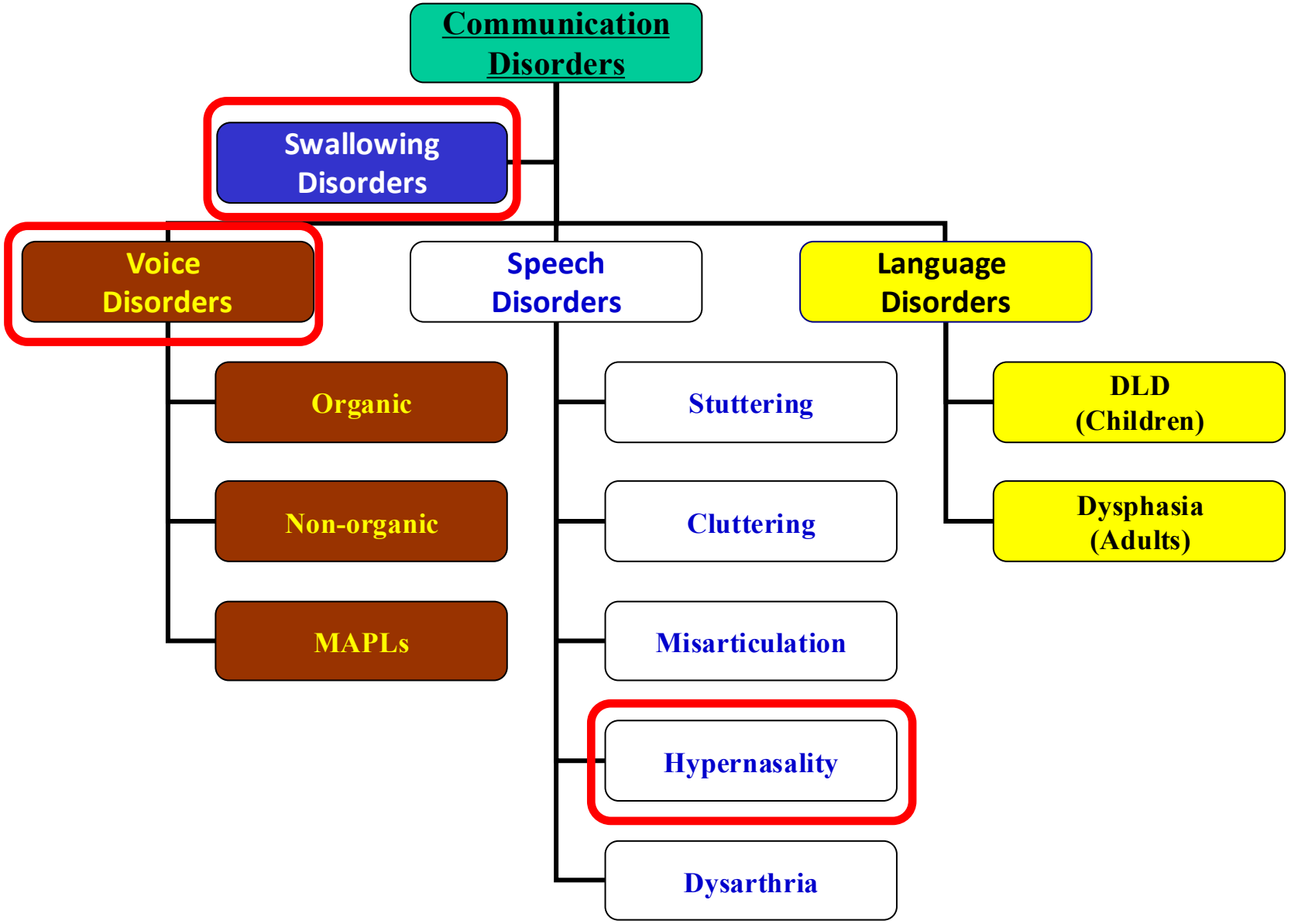
A neuro-muscular process whereby language is uttered. It includes the coordination of respiration, phonation, articulation, resonation and prosody.

Voice

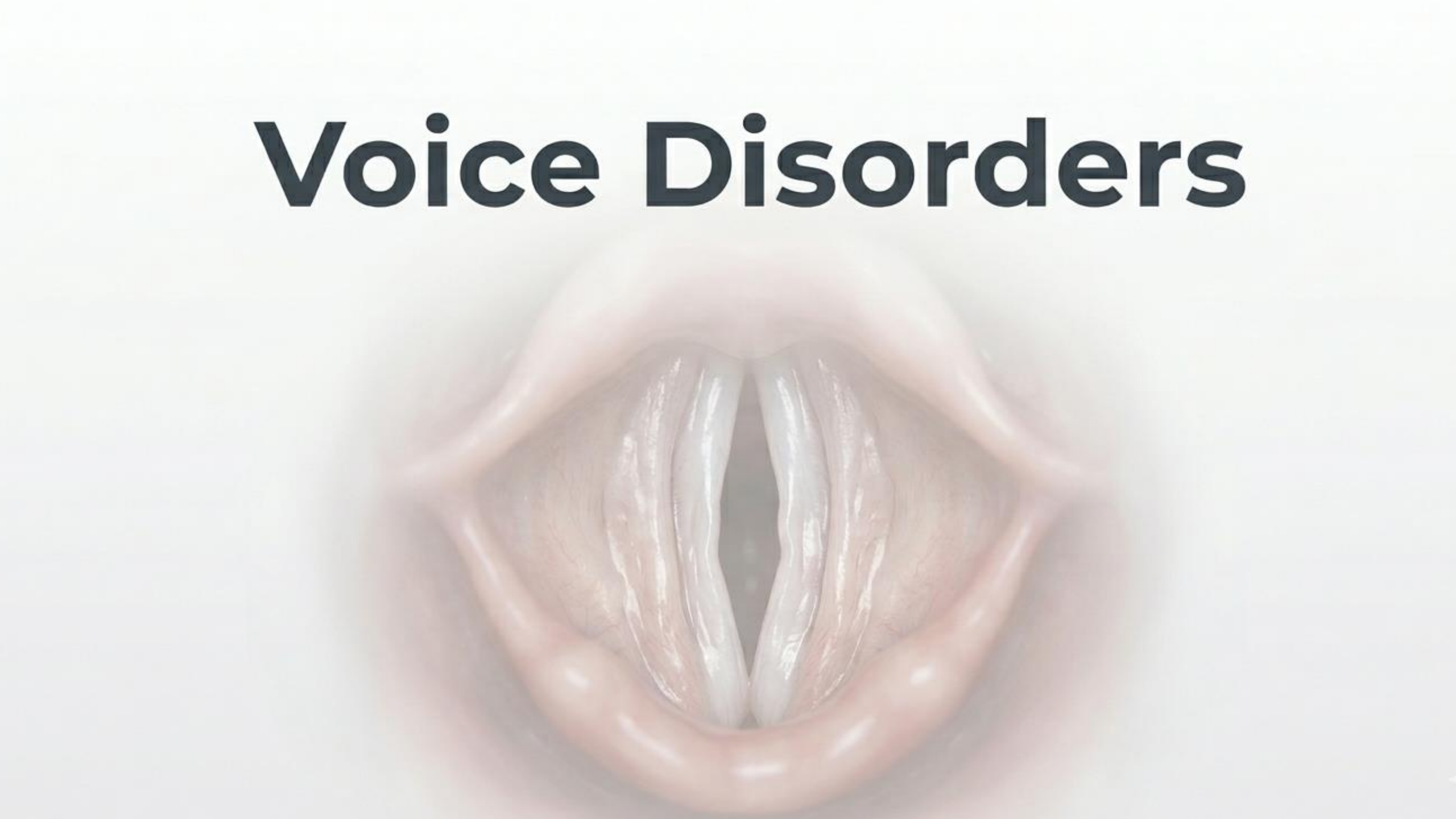
The result of vibration of the true vocal folds using the expired air.

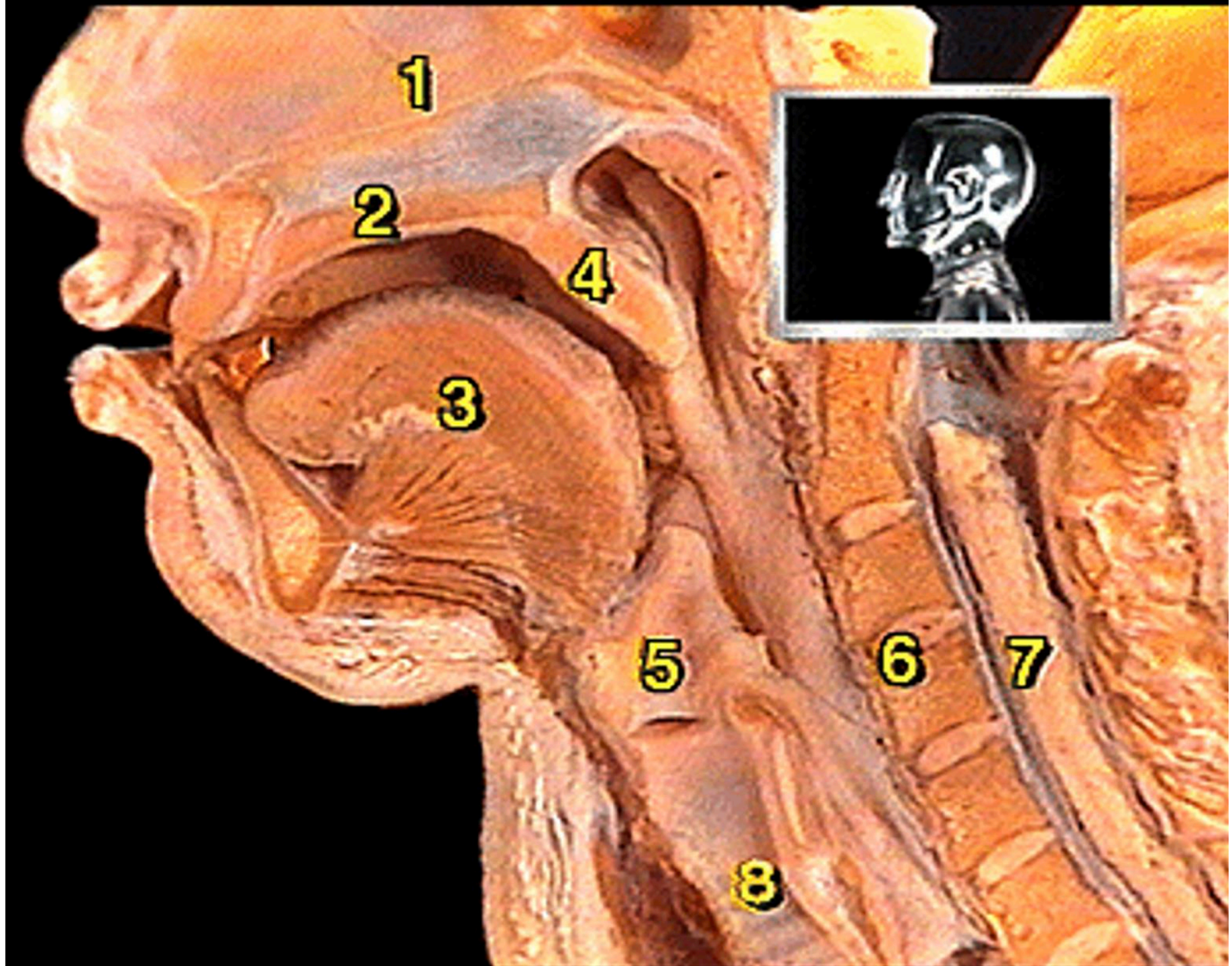
Swallowing

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


Communication Disorders
Swallowing Disorders
Voice Disorders
Speech Disorders
Language Disorders
Organic
Non-organic
MAPLs
Stuttering
Cluttering
Misarticulation
Hypernasality
Dysarthria
DLD (Children)
Dysphasia (Adults)

Voice Disorders

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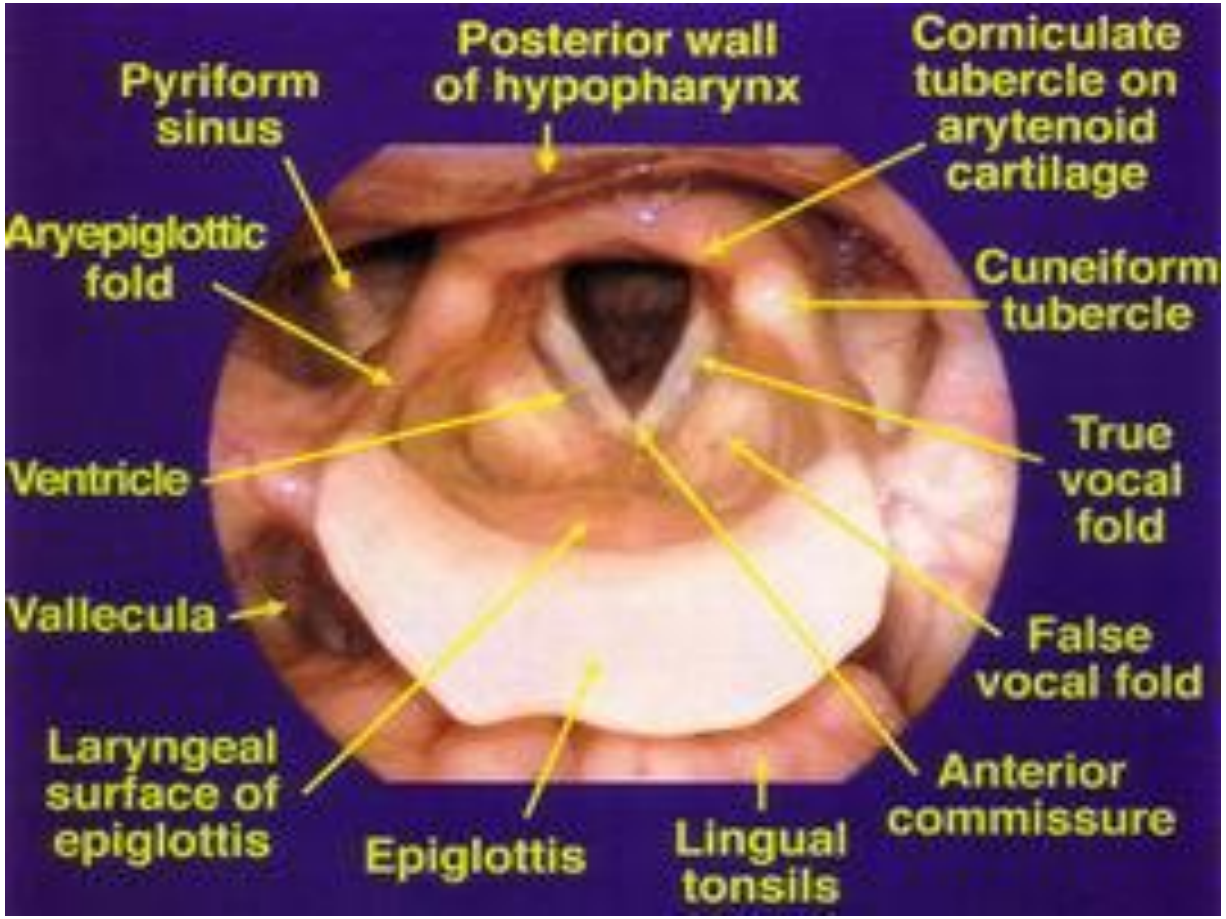

Pyriform sinus
Posterior wall of hypopharynx
Corniculate tubercle on arytenoid cartilage
Aryepiglottic fold
Cuneiform tubercle
Ventricle
True vocal fold
Vallecula
False vocal fold
Laryngeal surface of epiglottis
Epiglottis
Lingual tonsils
Anterior commissure

True vocal fold movements:

During breathing

(Abduction)

During phonation

(Adduction)

Functions of the larynx:

(1) Airway.

(2) Protection.

(3) Phonation.

(4) Increasing intra-thorasic Pressure.

Assessment of dysphonia:

I. History taking.

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

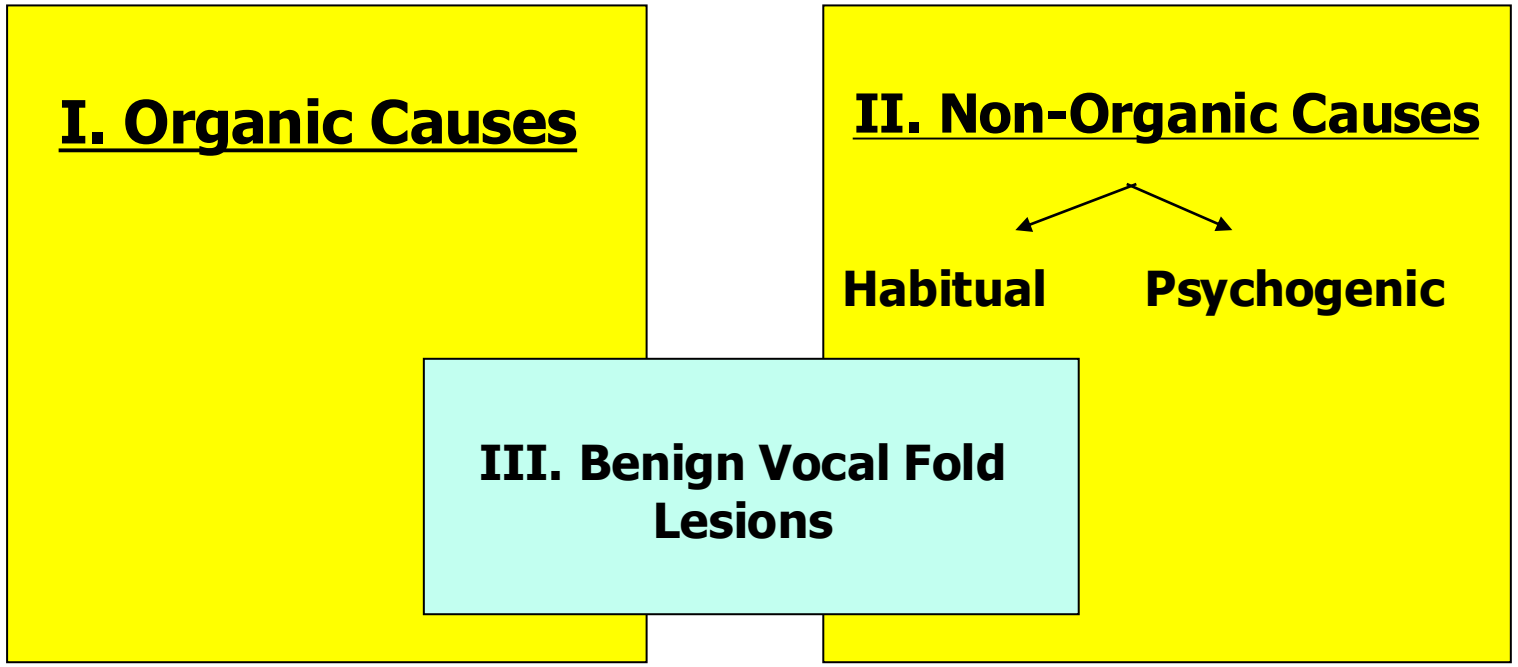
III. Investigations:

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

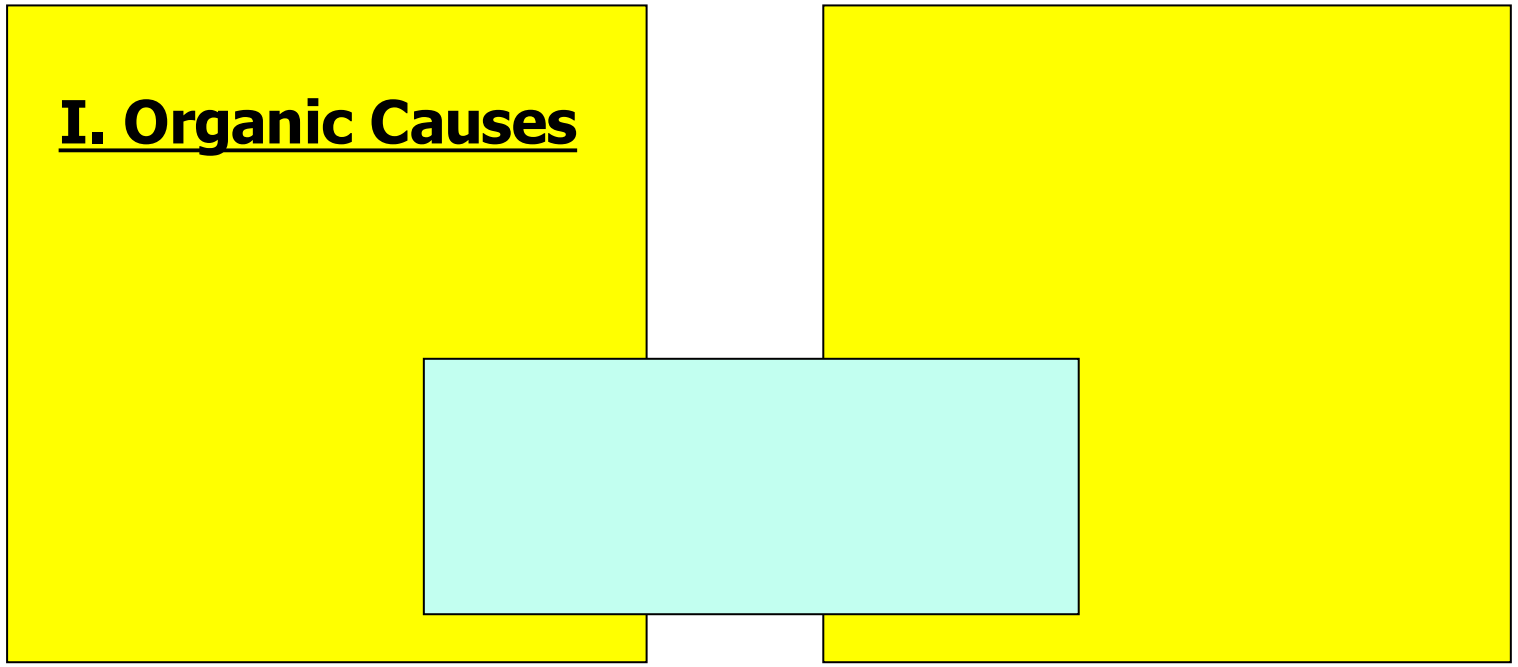

PENTAX

Stroboscopic Examination

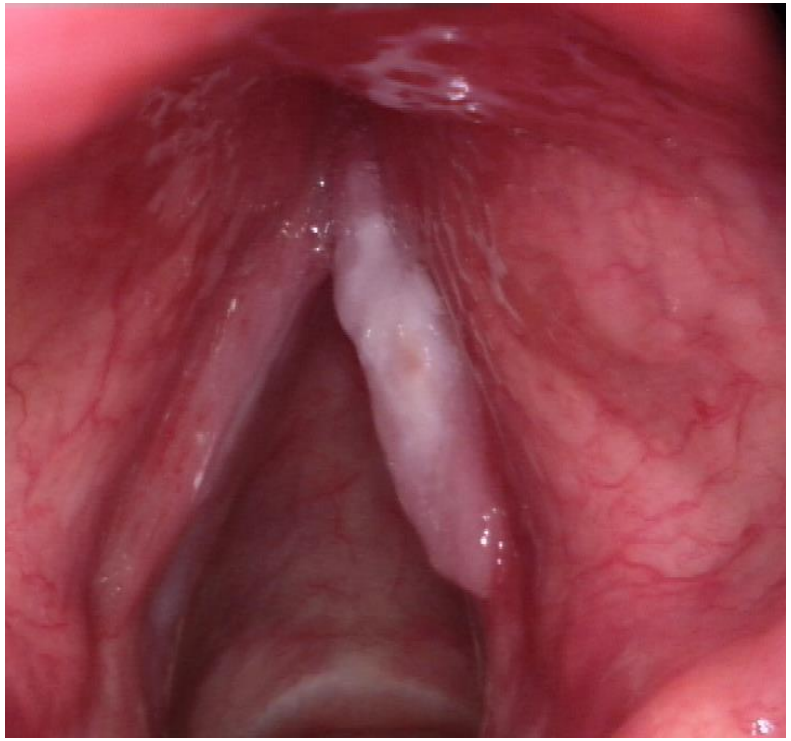
Etiological classification of dysphonia:



Etiological classification of dysphonia:



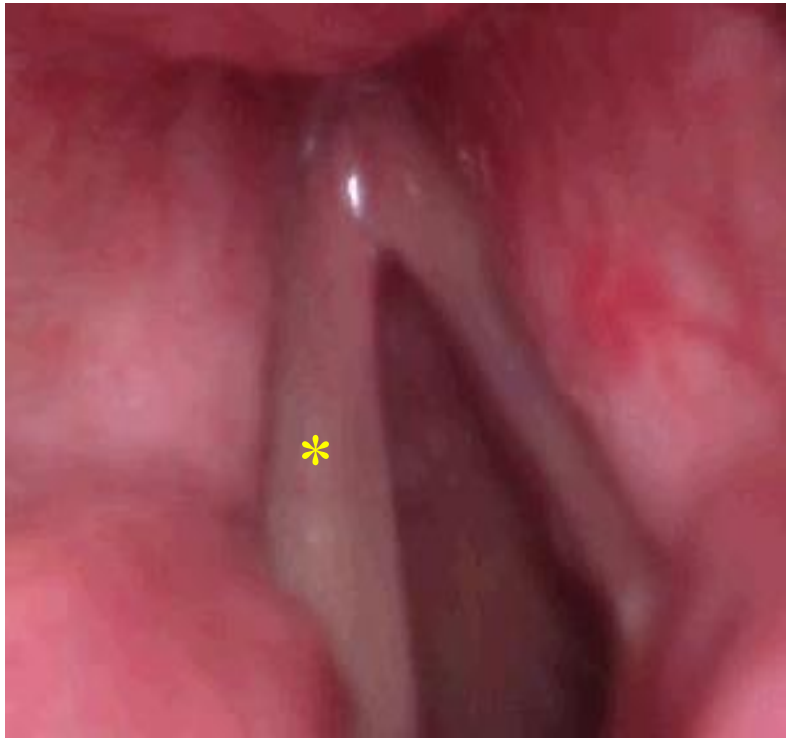
Laryngeal carcinoma



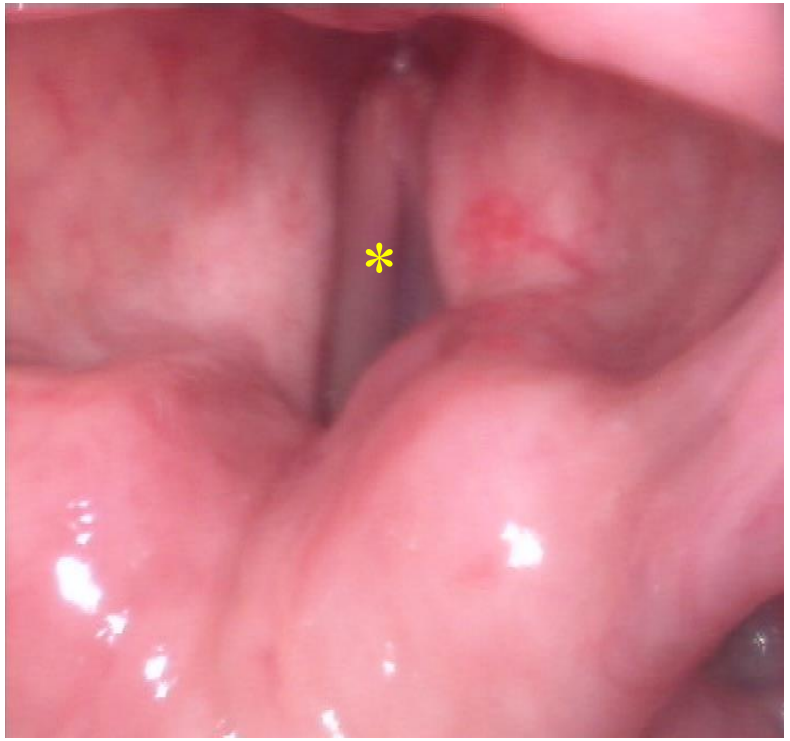
Respiration

Phonation

Left vocal fold paralysis



Respiration



Phonation

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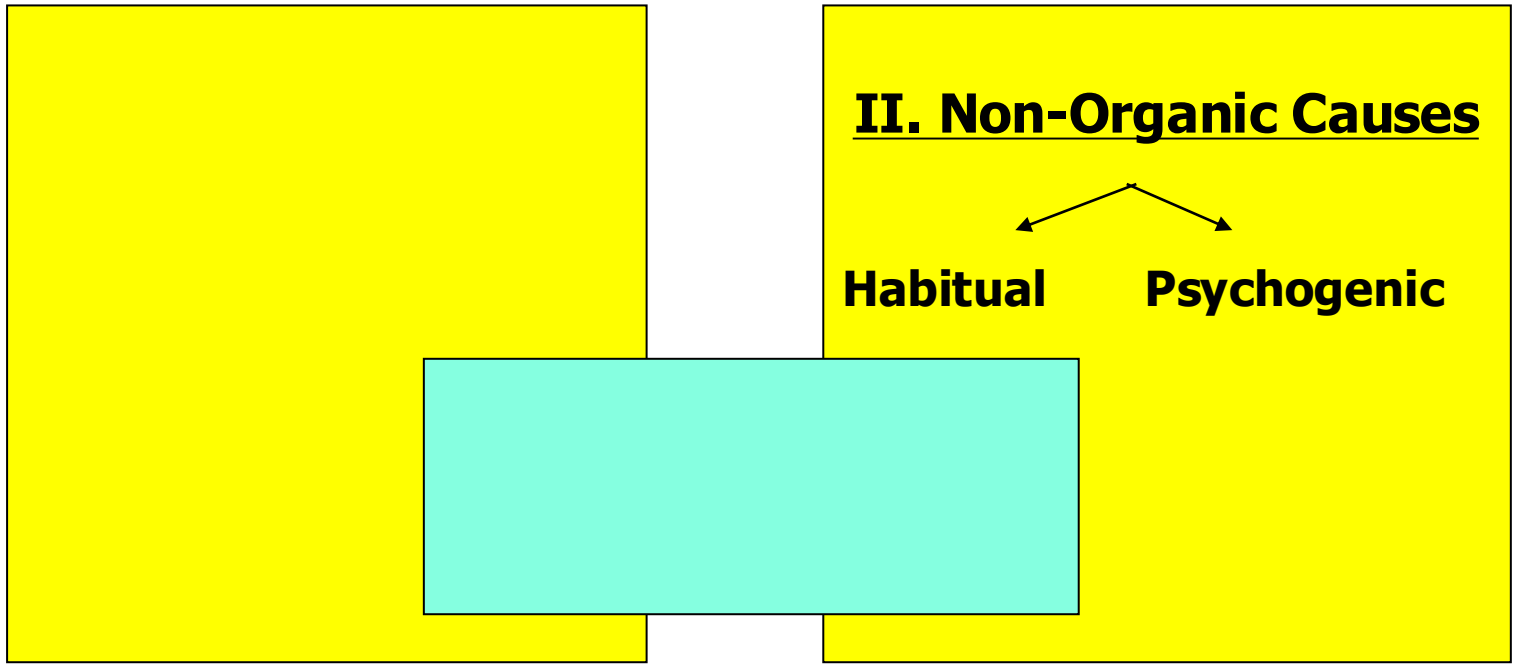
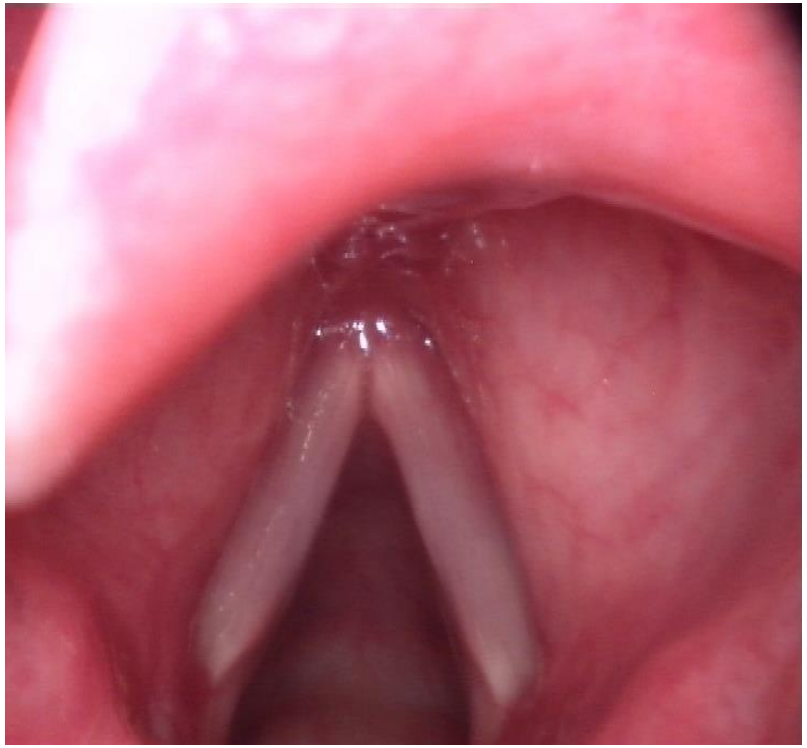
Etiological classification of dysphonia:



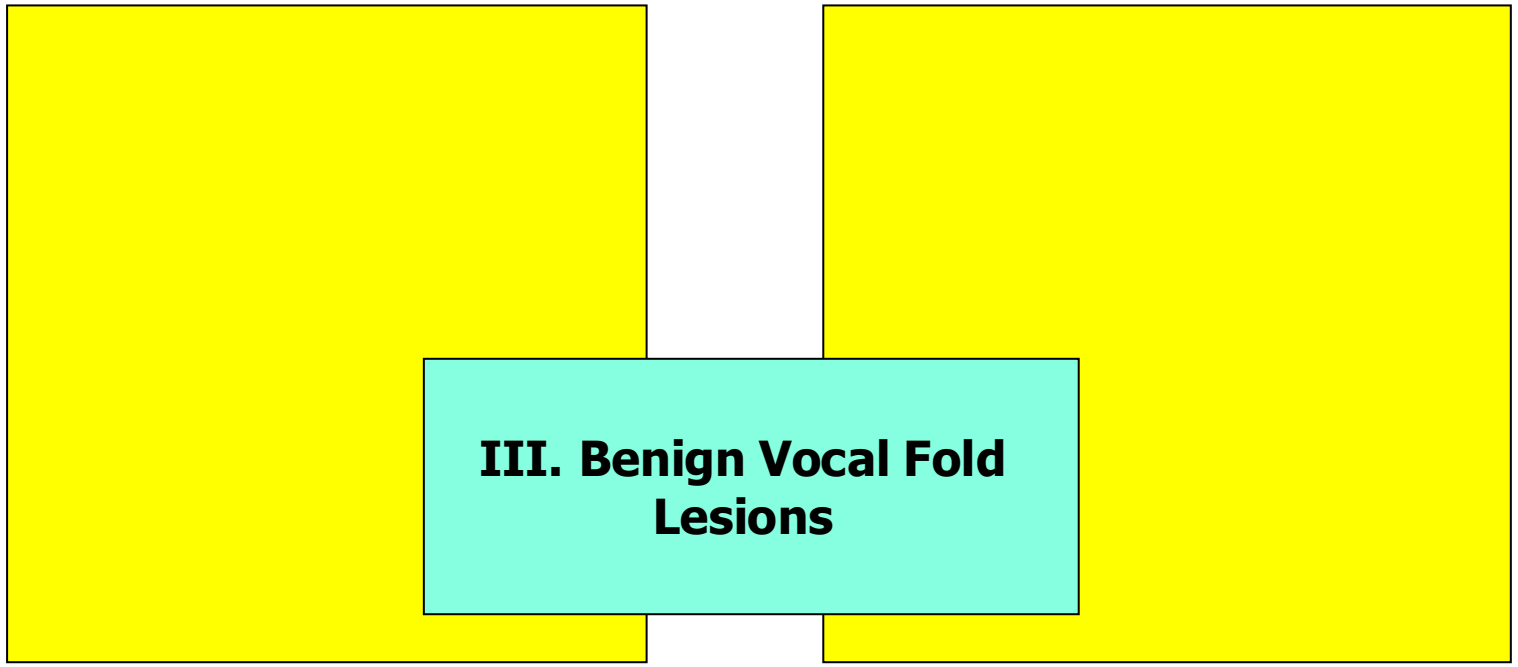
Phonasthenia



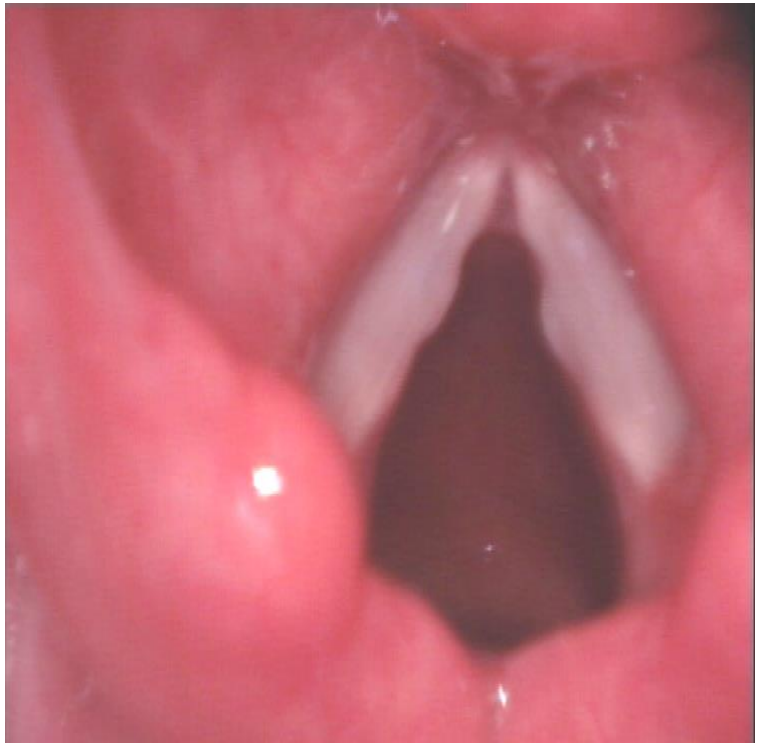
Respiration

Phonation

Etiological classification of dysphonia:



Vocal Fold Nodules: Adult Type



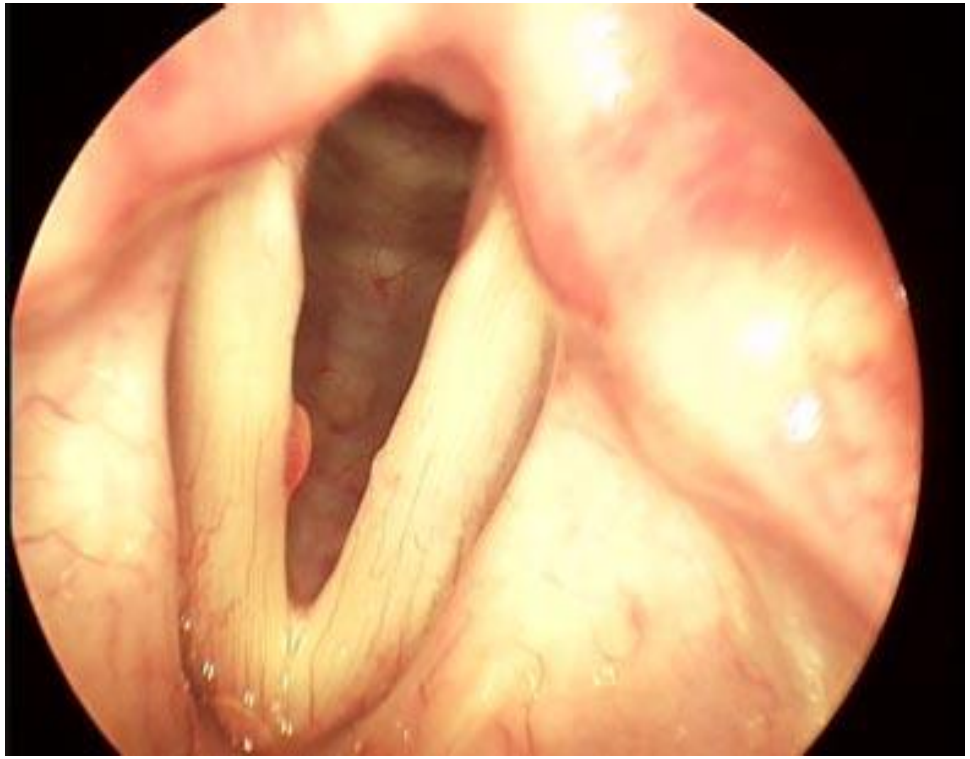
Respiration

Phonation

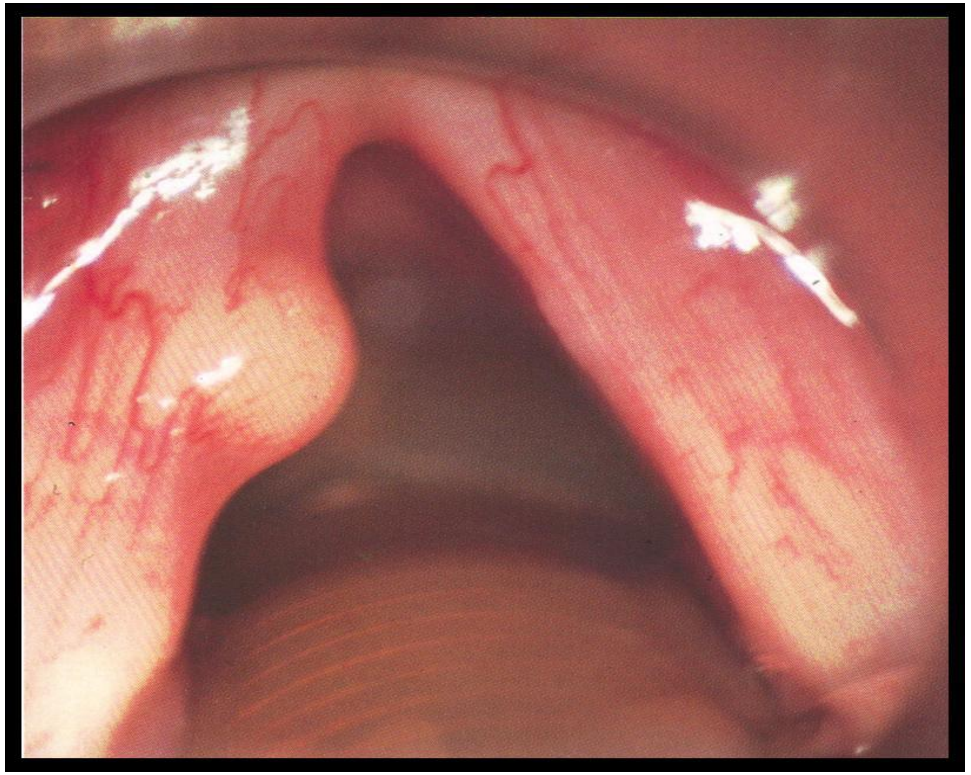
Left Vocal Fold Polyp

Respiration

Phonation



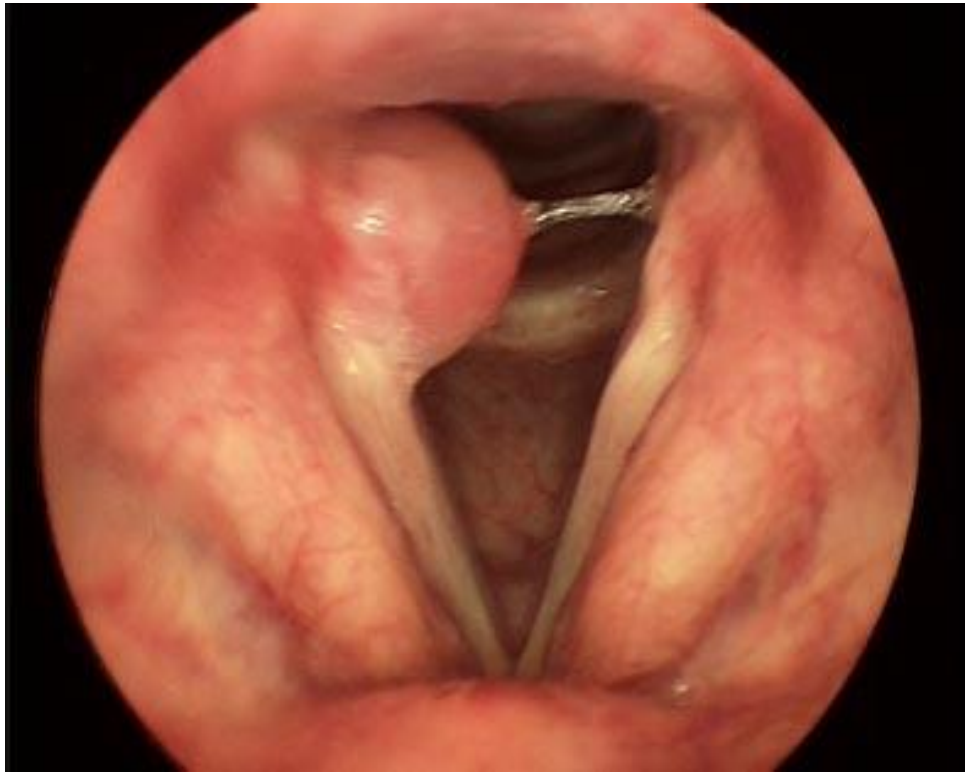
Left Vocal Fold Cyst

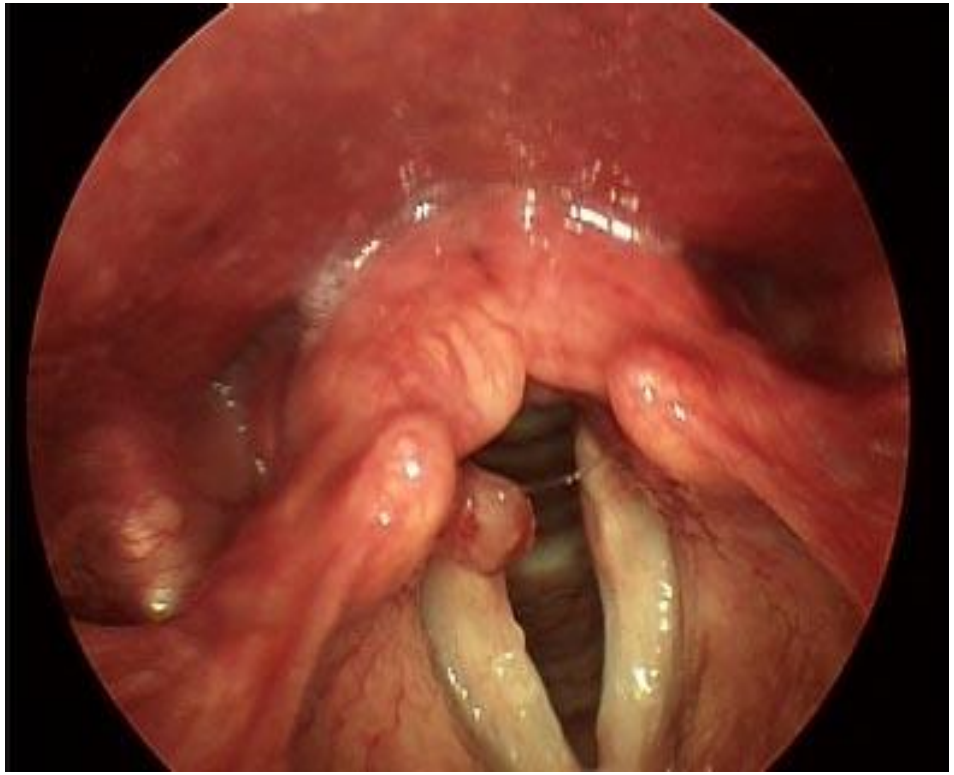


Right Vocal Fold Cyst

Reinke’s Edema

Right-sided Contact Granuloma





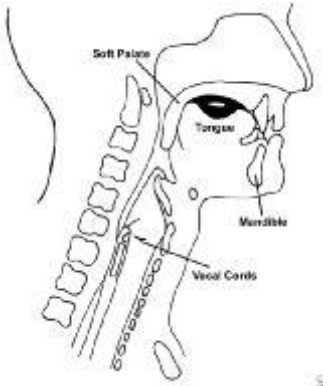
Management of voice disorders:

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

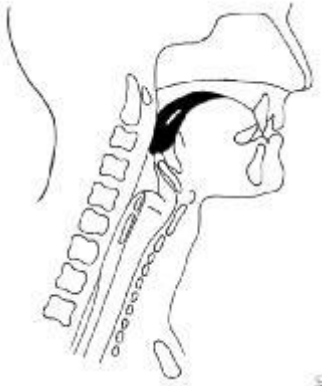
Emerging roles of AI in Voice Disorders:

- Automated acoustic voice analysis for screening and follow-up.
- AI-assisted analysis of laryngoscopic and stroboscopic images.
- Early detection of voice changes in professional voice users.
- Supportive tools for voice therapy monitoring.

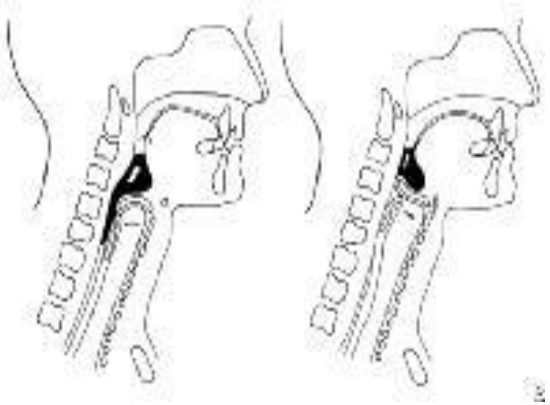
Phases of normal swallowing:



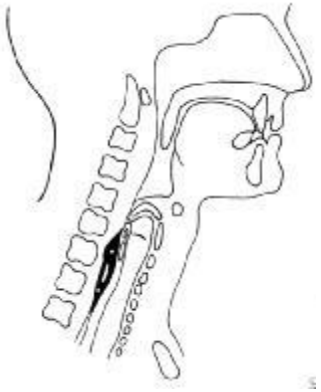
1. Oral preparatory phase



2. Oral propulsive phase



3. Pharyngeal phase

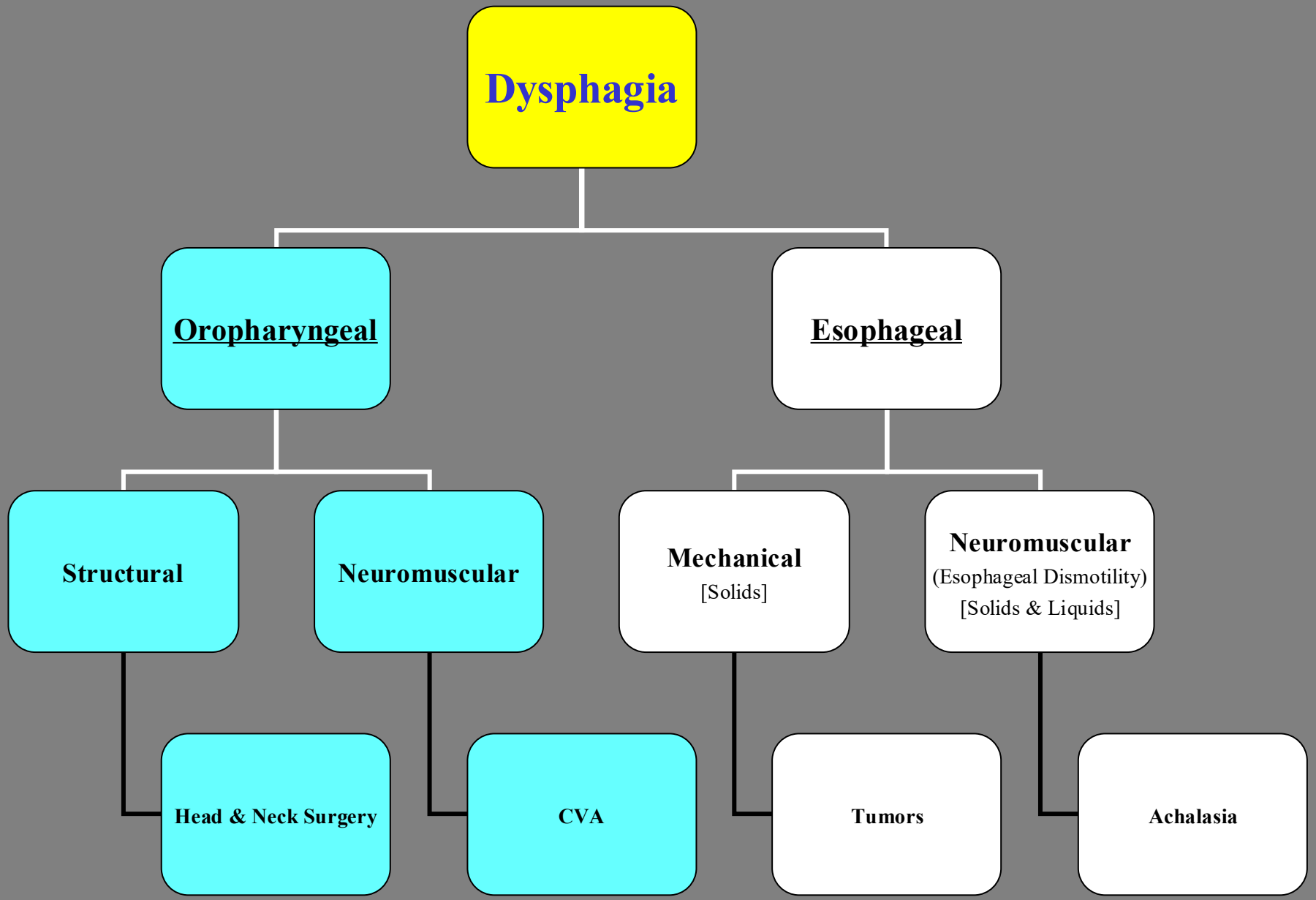


4. Esophageal phase

Consequences of dysphagia:

- **Dehydration.**
- **Weight loss.**
- **Aspiration pneumonia.**
- **Airway obstruction.**
- **Loss of joy of eating.**

Causes of dysphagia:



Assessment of dysphagia:

I. History taking.

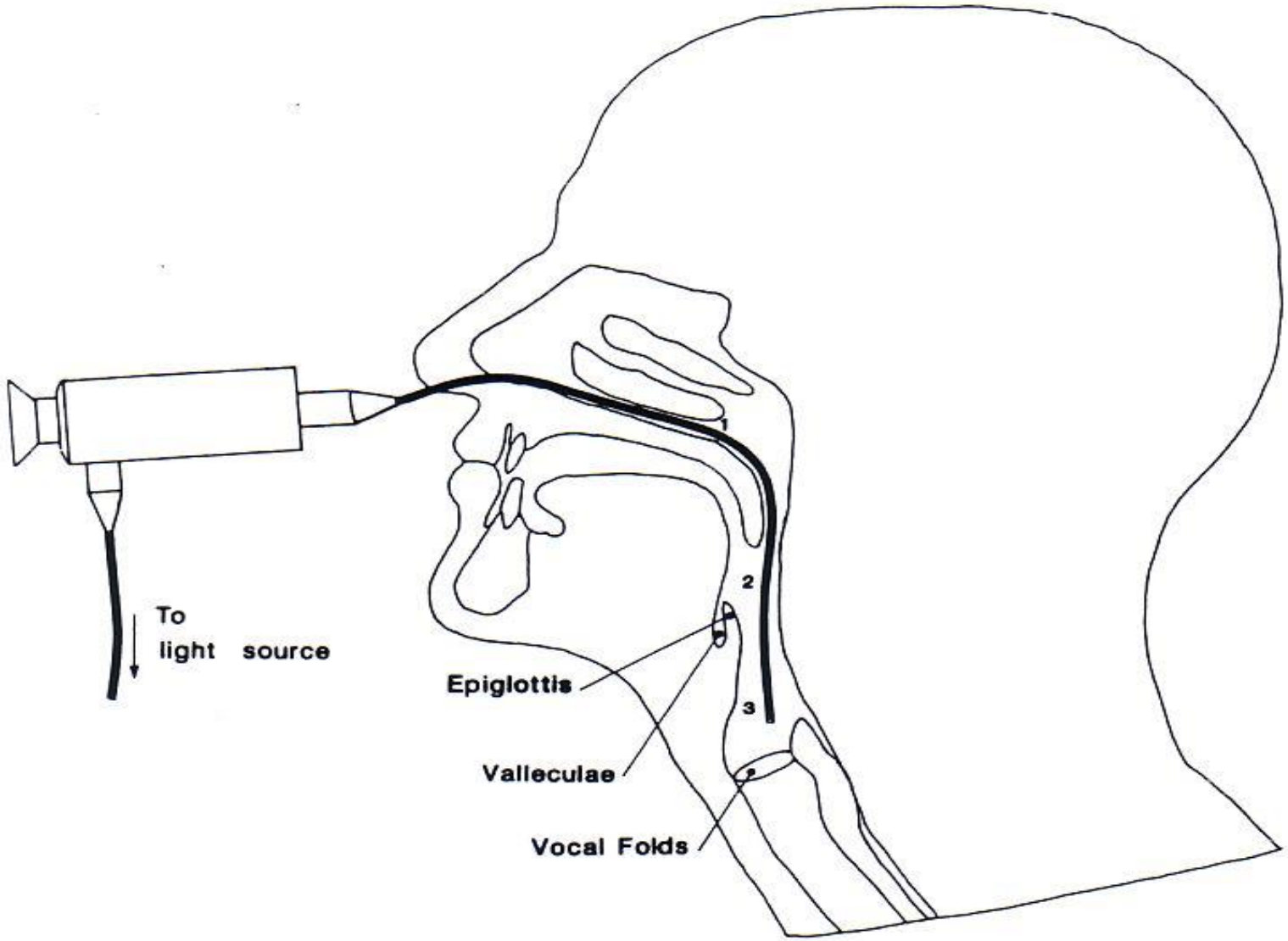
II. Physical examination:

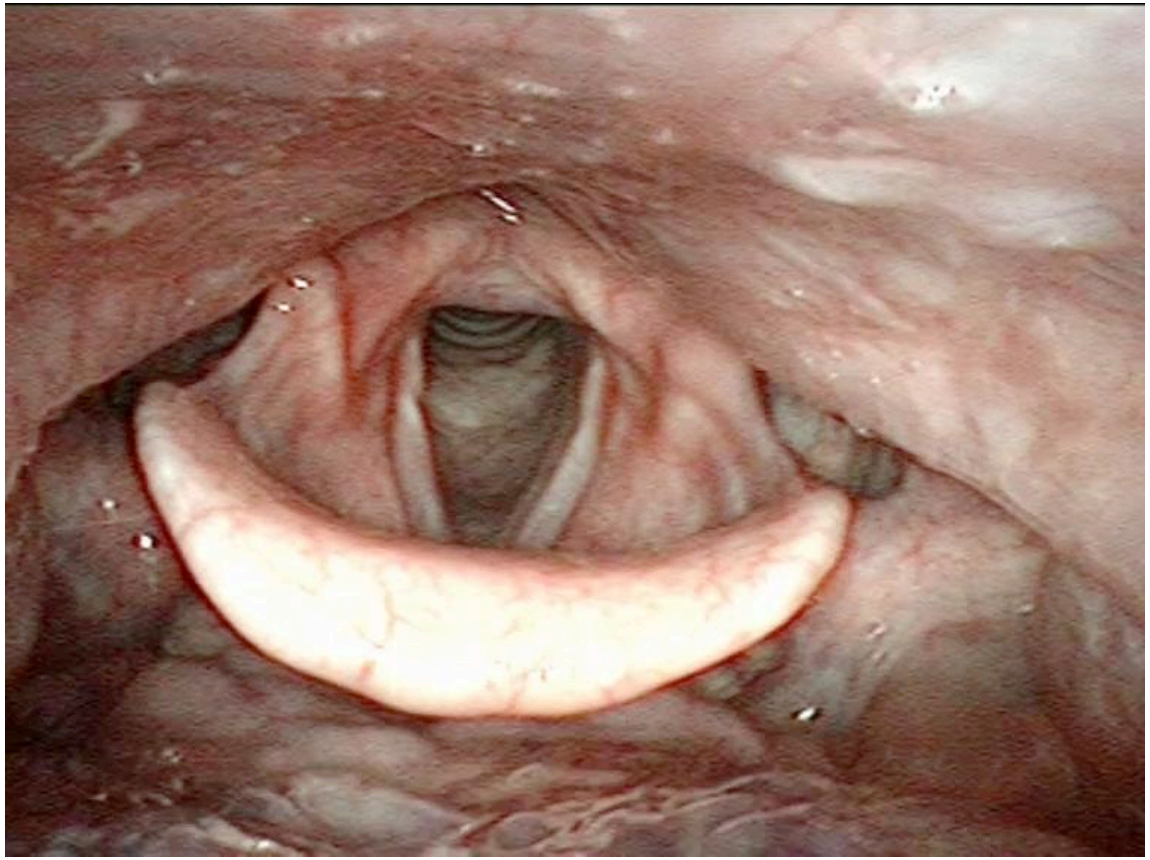
- General examination.
- Language and Speech assessment.
- Vocal tract examination.
- Neck examination.
- Trail feeding.

III. Investigations:

- FEES.
- VFES (MBS).
- GERD (LPR) work-up.

FEES


To
light source
1
2
3
Epiglottis
Valleculae
Vocal Folds

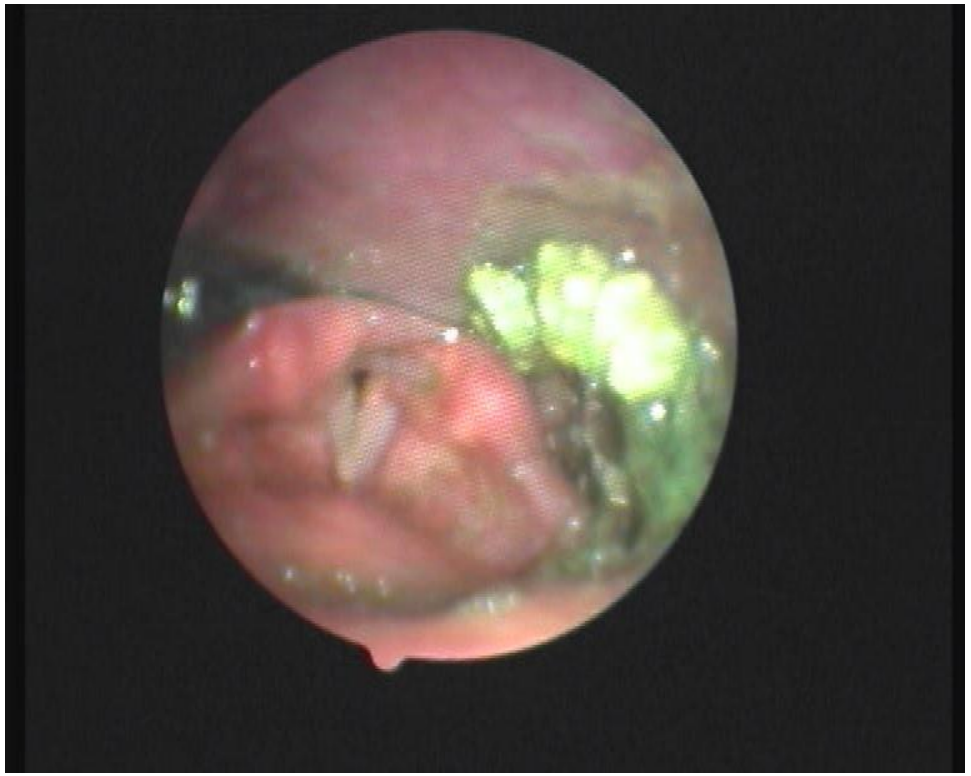


Talking Pharynx

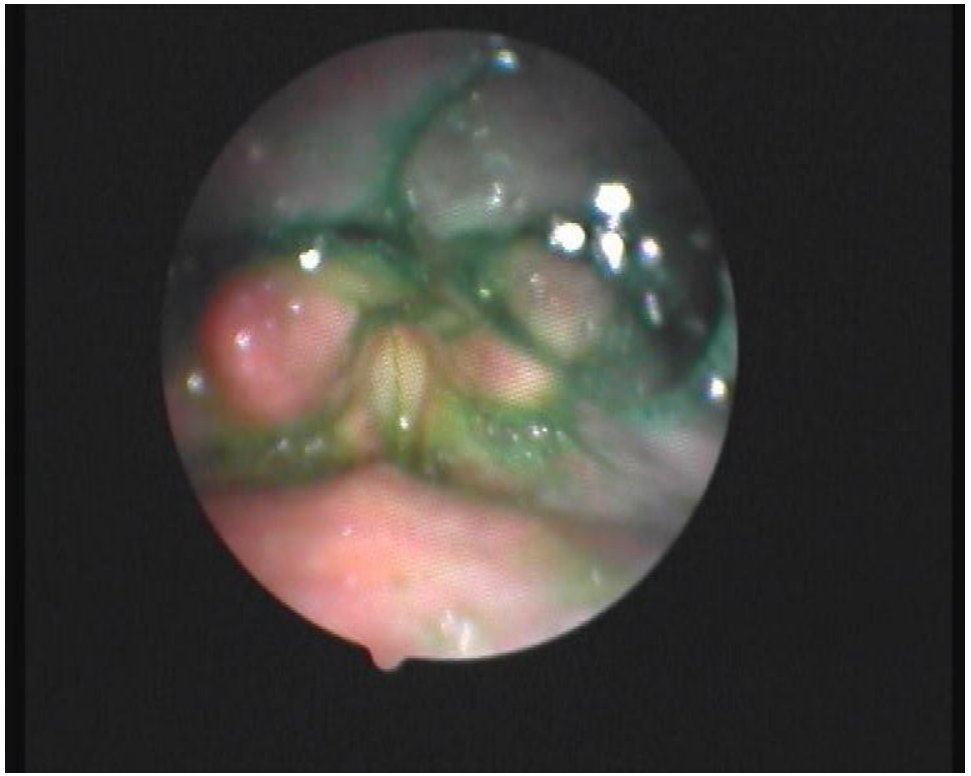
Youtube Video

Normal FEES

(Thin fluid dyed blue)

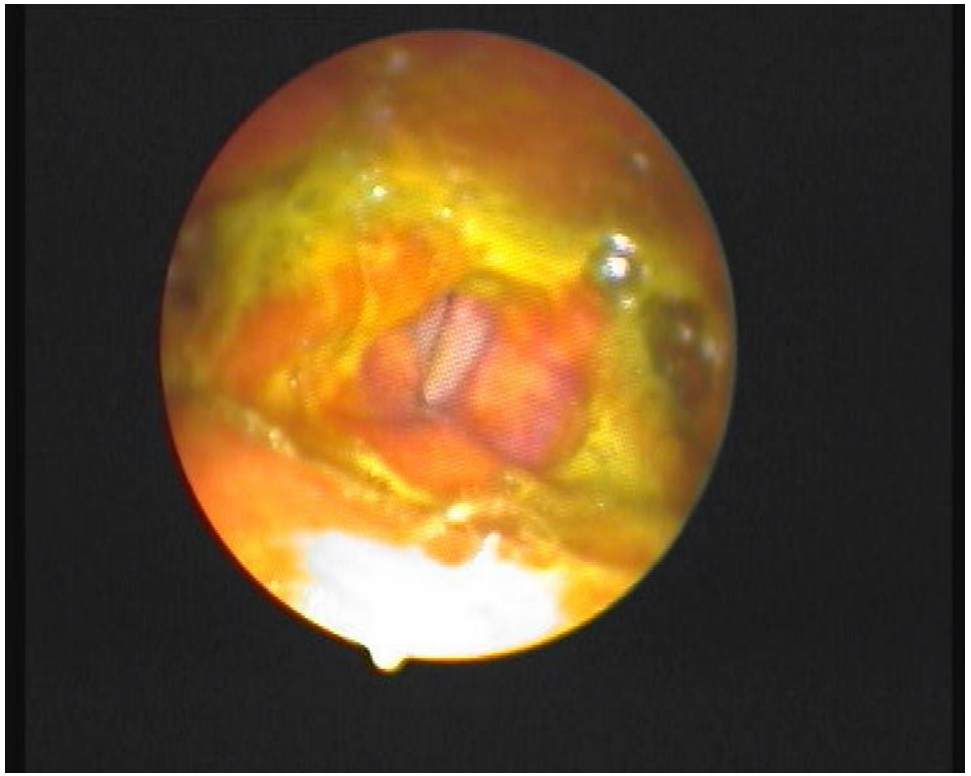


Residue

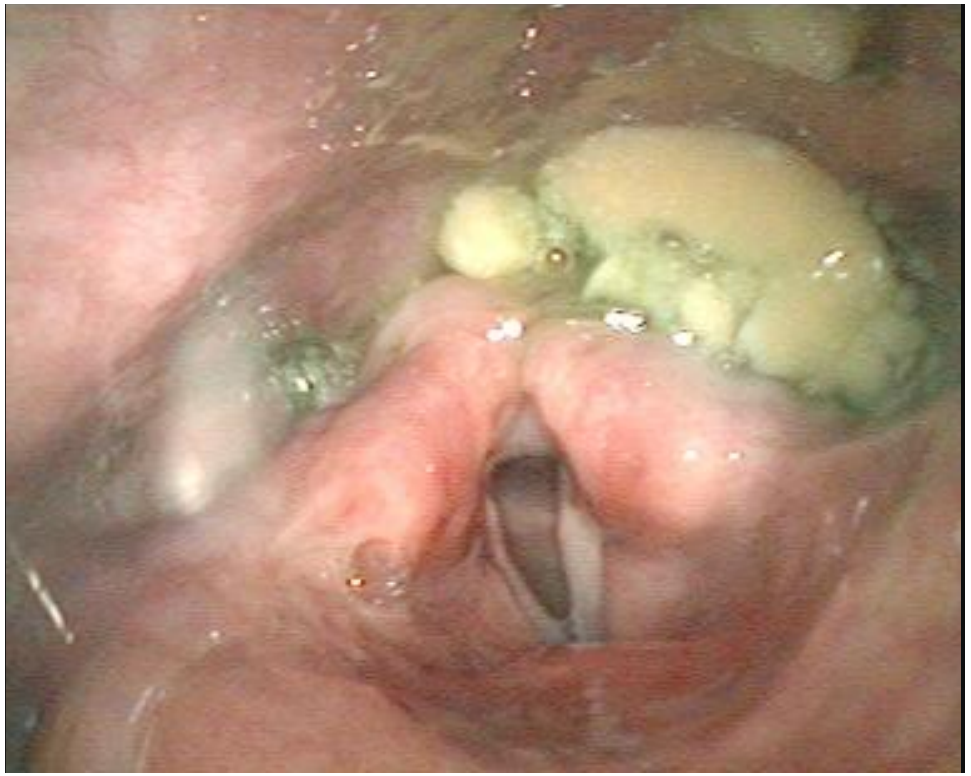


Penetration

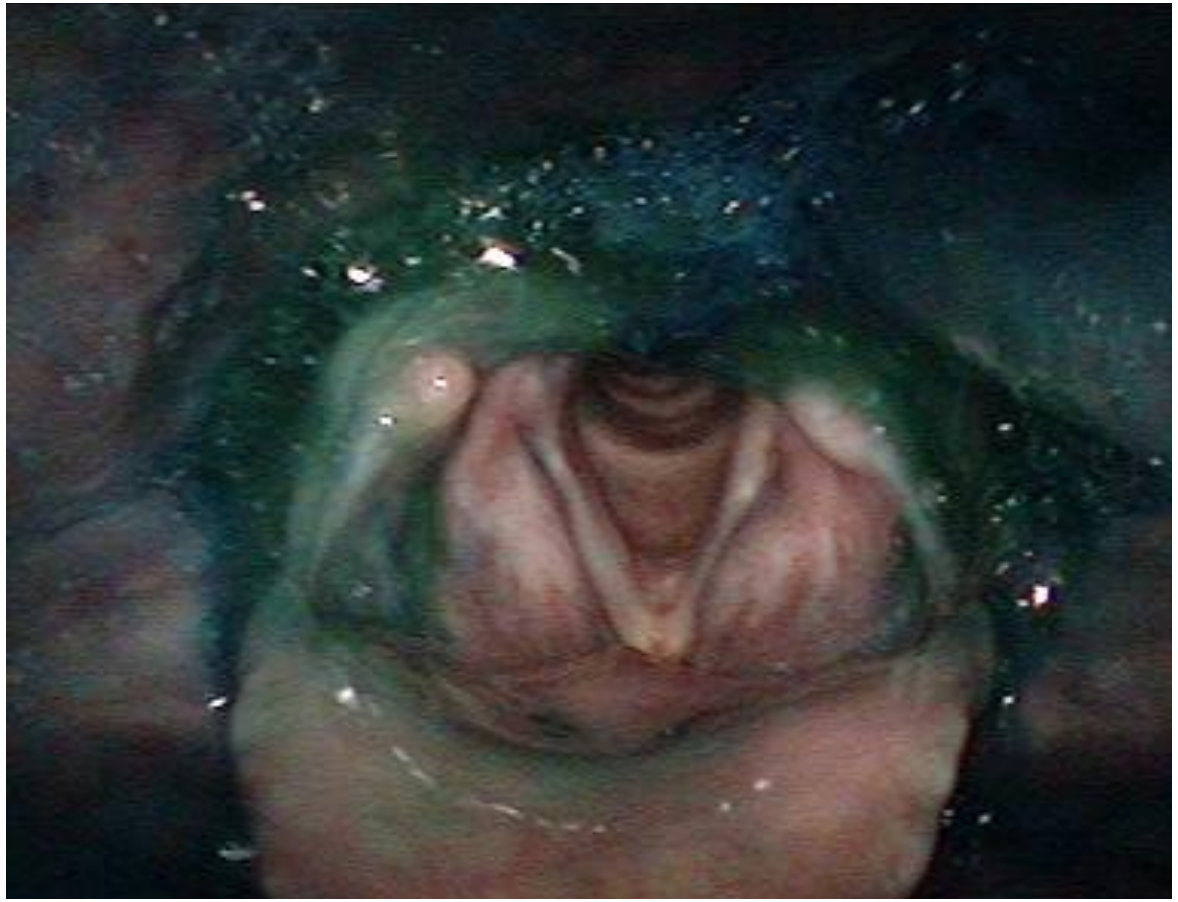
Aspiration



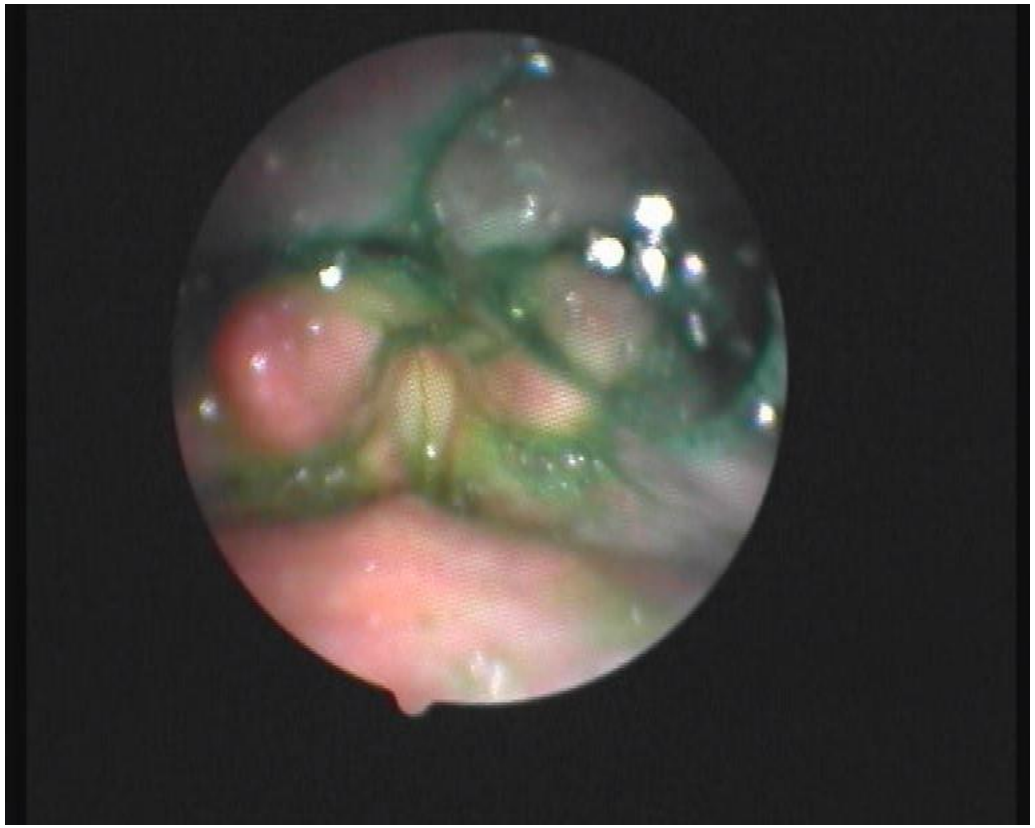
Residue



Residue



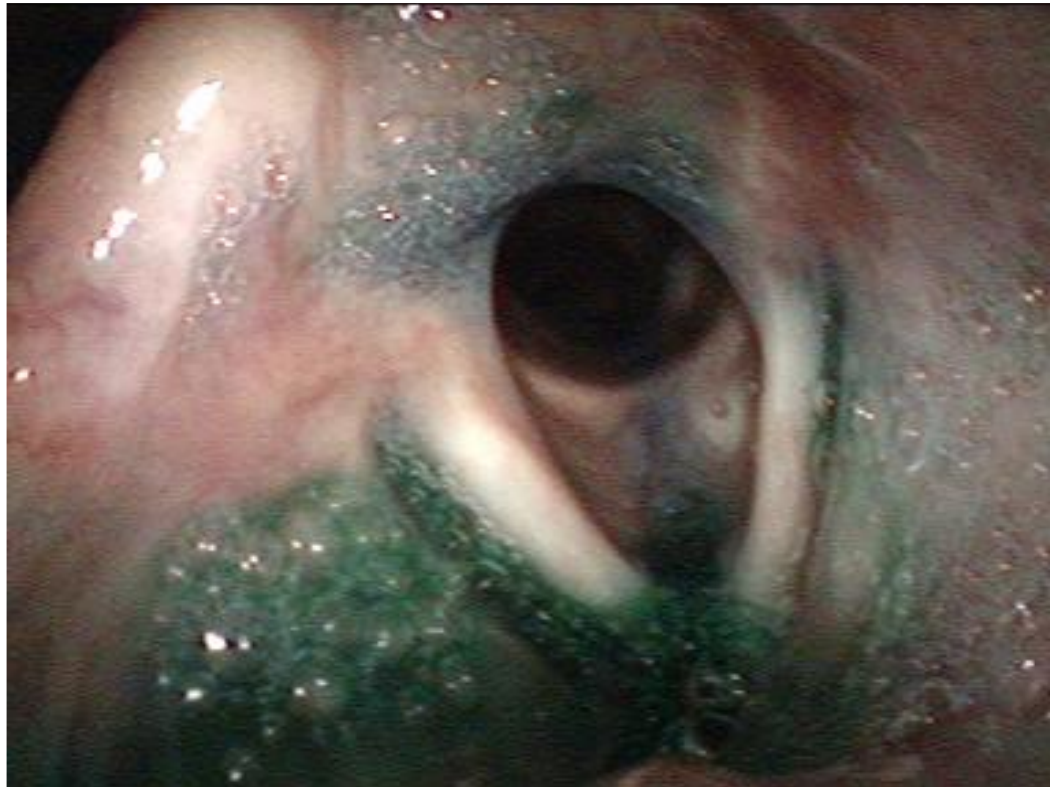
Residue



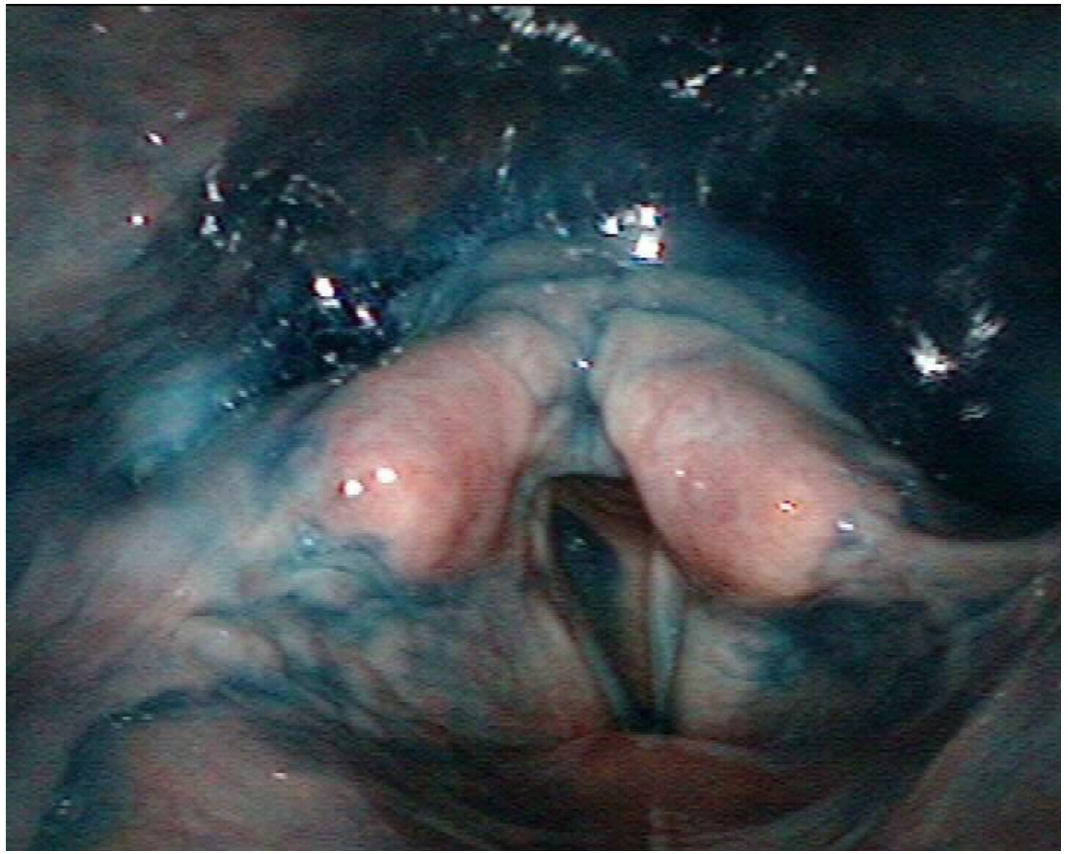
Penetration

Penetration

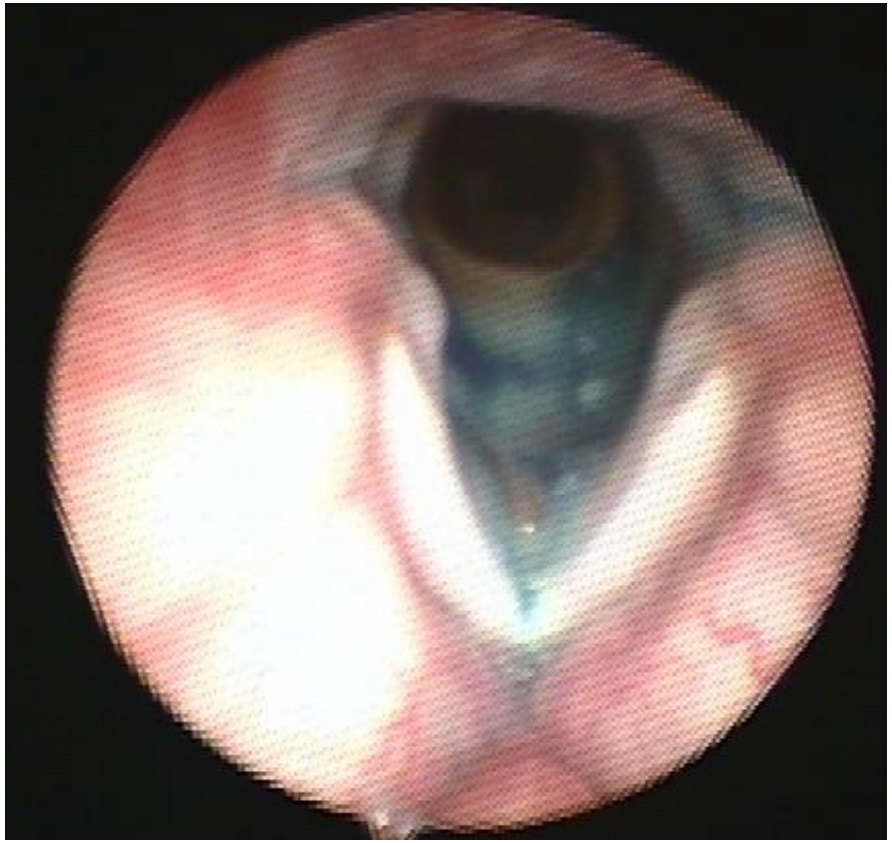
Aspiration



Aspiration



Aspiration



Aspiration

Aspiration

VFES (MBS)

Management of dysphagia:

- Swallowing therapy:
  - Diet modification.
  - Postural techniques.
  - Swallowing maneuvers.
  - Sensory enhancement techniques.
  - Motor exercises.
- Surgical treatment, eg medialization laryngoplasty.
- Medical (Drug) treatment, eg anti-parkinsonism drugs.
- Intraoral prosthesis.
- Alternative routes of feeding, eg NG tube feeding.

Emerging roles of AI in Swallowing Disorders:

- AI-assisted interpretation of FEES and VFES images.
- Automated detection of penetration and aspiration risk.
- Decision-support tools for dysphagia management.
- Monitoring swallowing therapy outcomes.

Speech Disorders

1. Dyslalia (Misarticulation):

Definition:

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

Management of dyslalia:

- **Treatment of the cause:**

  . Tongue tie.

  . Dental anomalies.

- **Speech therapy.**

2. Stuttering:

<u>Definition</u>:

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

Management of stuttering:

- **Family and patient counseling.**
- **Speech therapy:**

  a. Indirect therapy: if not aware.

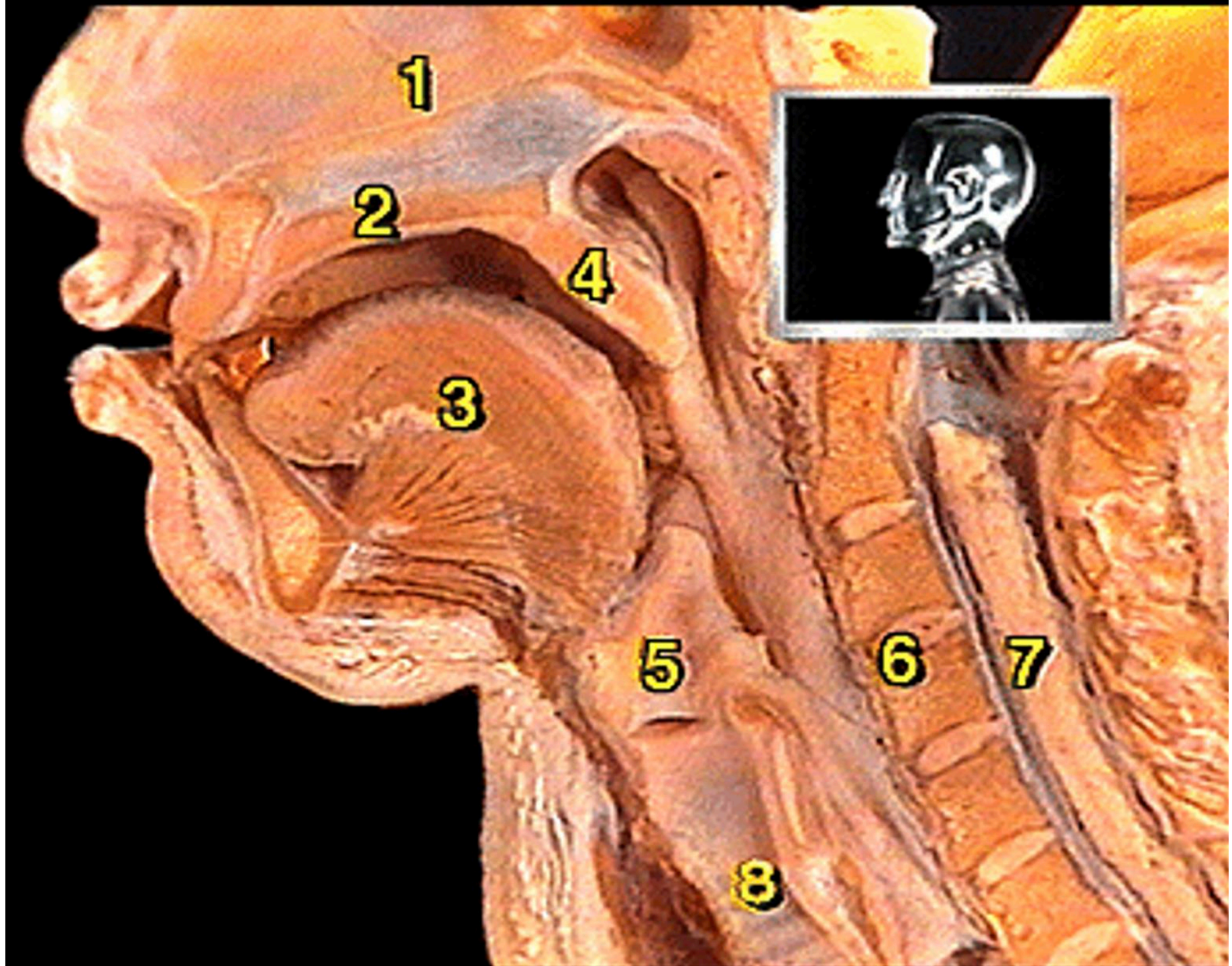
  b. Direct therapy: if aware.

3. Hypernasality:

Definition:

Faulty contamination of the speech signal by the addition of nasal noise.

It results from velopharyngeal insufficiency (VPI).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Management of hypernasality:

- Team work.
- Feeding.
- Hearing.
- Maxillofacial.
- Palatal and lip surgeries.
- Obturators.
- Communication:
    - . Language: Language therapy.
    - . Speech: Speech therapy.
    - . Voice: Voice therapy.

4. Dysarthria:

Definition:

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

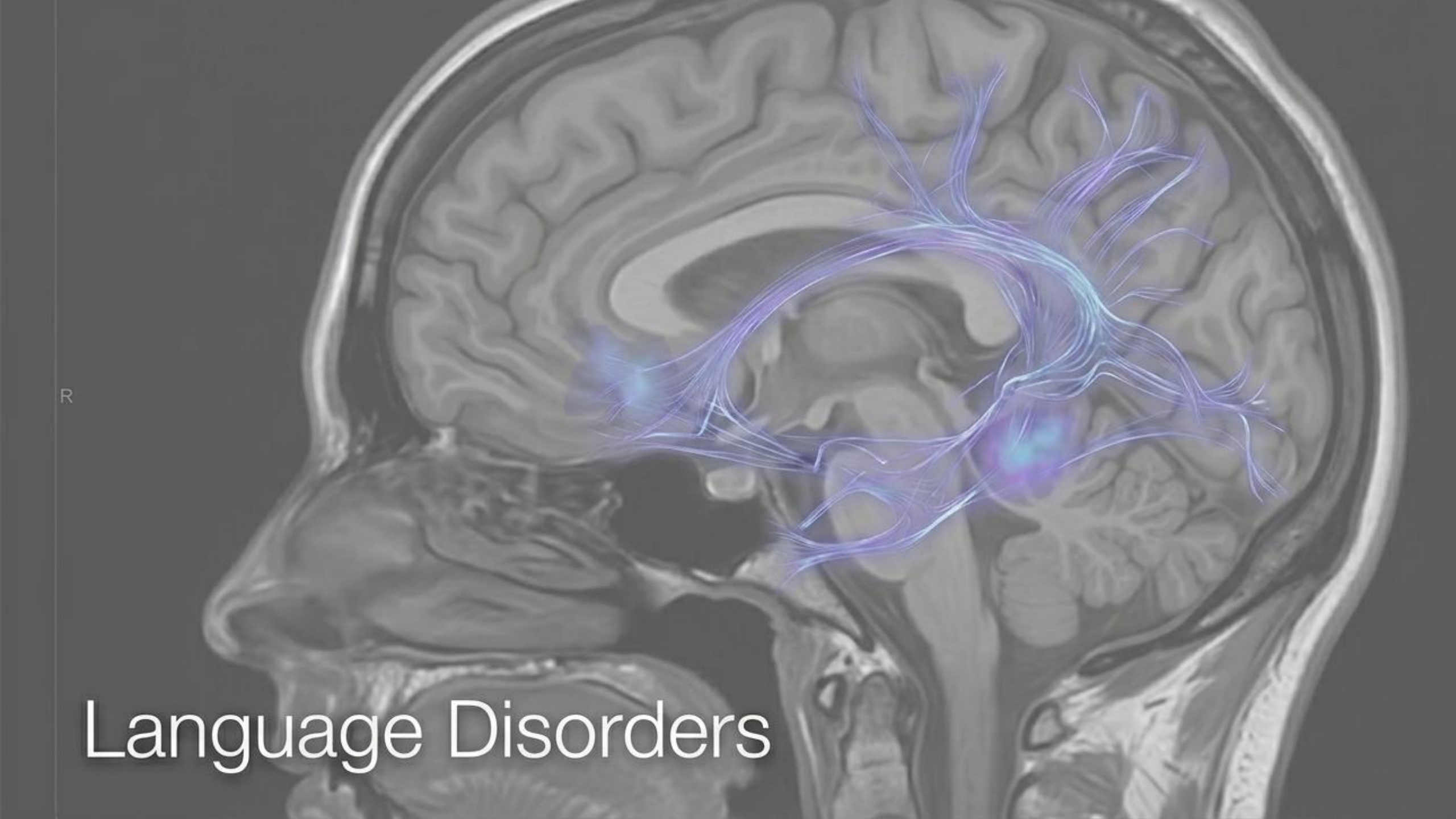
Management of dysarthria:

Individualized:

- Management of the cause.
- Patient counseling.
- Communicative therapy:
    * Articulation.
    * Phonation.
    * Resonance.
    * Respiration.
    * Prosody.
- Alternative and augmentative communication.

Emerging roles of AI in Speech Disorders:

- AI-based speech recognition for articulation and fluency analysis.
- Automated analysis of stuttering frequency and severity.
- Support tools for speech therapy exercises and feedback.
- Early screening of motor speech disorders.



Language Disorders

[1] Developmental Language Disorder (Delayed Language Development) (DLD):

Definition of DLD:

Delay or failure to acquire language matched with age.

Causes of DLD:

A) Brain damage:

- **Diffuse brain damage (MR).**
- **Brain damaged motorly handicapped child (CP).**
- **Minimal brain damage (ADHD).**

B) Sensory deprivation:

Hearing impairment.

C) Psychiatric disorders:

- **Autism.**
- **Childhood schizophrenia.**

D) Non-stimulating environment.

E) Idiopathic.

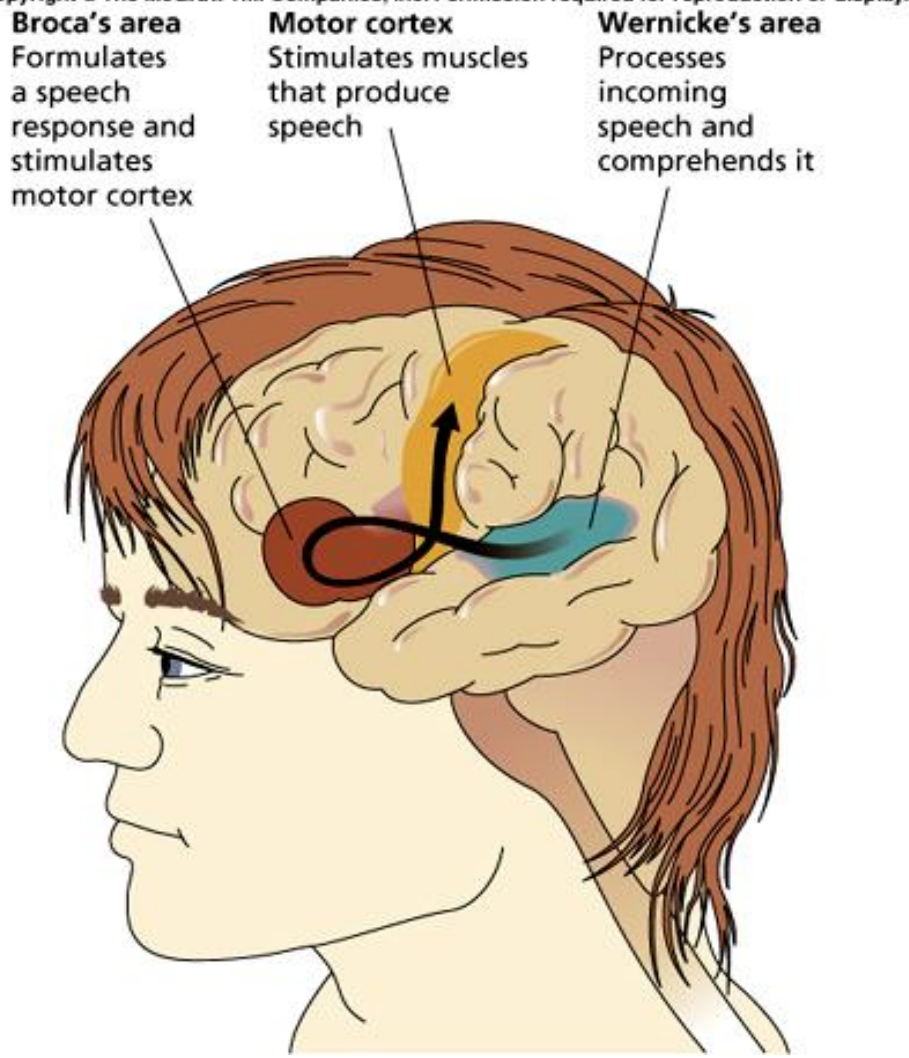
Management of DLD:

- **Early detection.**
- **Providing the suitable aid (HA or CI).**
- **Family counseling.**
- **Language therapy.**

[2] Dysphasia:

Definition:

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



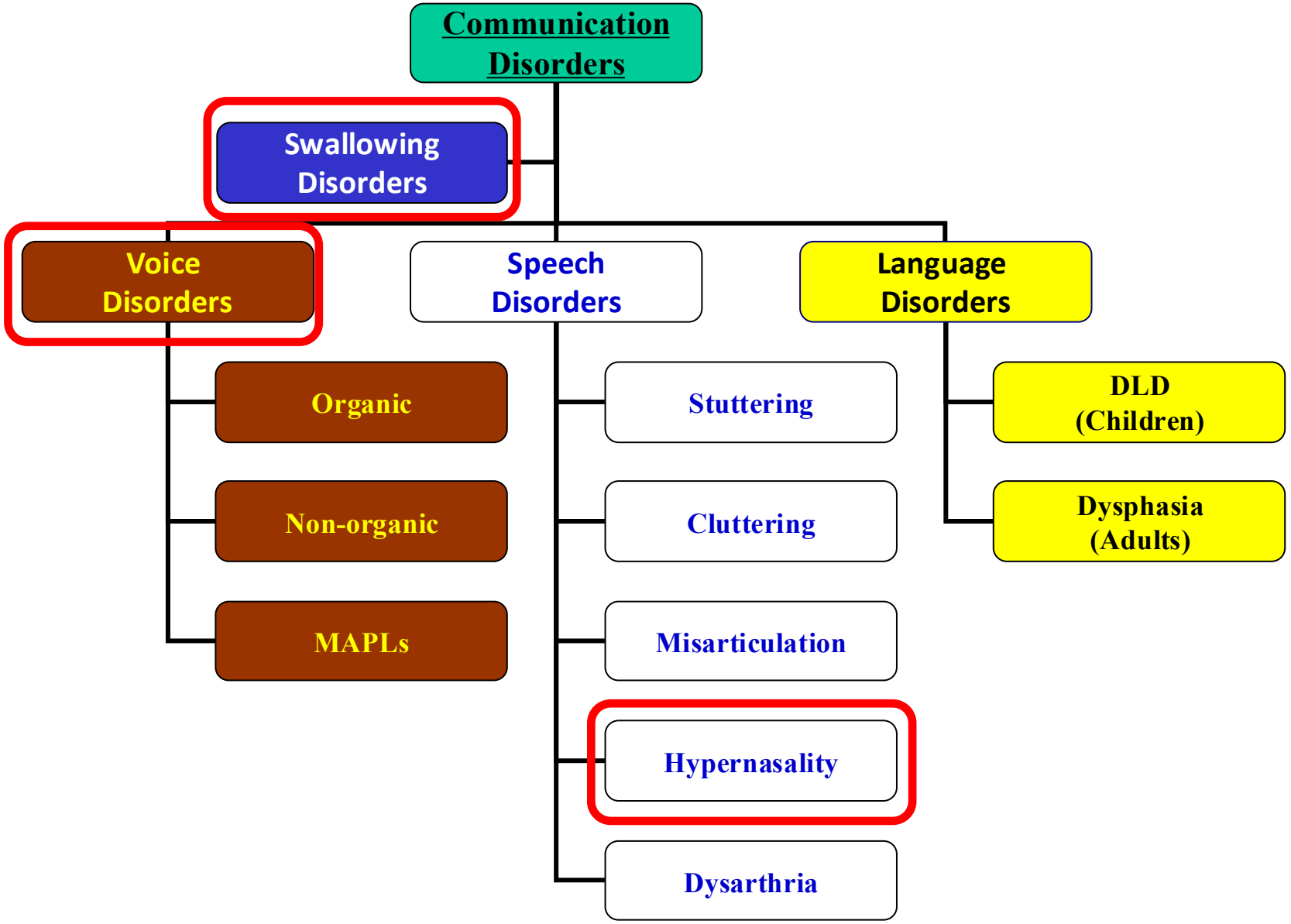
Management of dysphasia:

Individualized:

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

Emerging roles of AI in Language Disorders:

- Language sample analysis using natural language processing.
- Early screening tools for developmental language disorder.
- AI-supported assessment in aphasia rehabilitation.
- Assistive communication technologies.


Communication Disorders
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Organic
Non-organic
MAPLs
Stuttering
Cluttering
Misarticulation
Hypernasality
Dysarthria
DLD (Children)
Dysphasia (Adults)

Office Hours

- Sunday: 9-11 am
- Tuesday: 9-11 am

Building 3 level 4 CSDU