

# Speech disorders

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## SPEECH DISORDERS

### DYSPHONIA

1. Vocal cord muscle paralysis / fatigability
2. Spasmodic dysphonia

### DYSARTHRIA

1. Lower motor neuron (flaccid dysarthria)
2. Upper motor neuron (spastic dysarthria)
3. Cerebellar (ataxic dysarthria)
4. Extrapyrmidal (hypo- / hyper-kinetic dysarthria)
5. Mixed dysarthria

### **SPEECH TESTING**

**CN7** – pronounce **LABIAL SOUNDS** – M, B, P. “Say 'baby hippopotamus'”

**CN12** – pronounce **LINGUAL SOUNDS** – T, D, L. “Say 'yellow lorry'”

**CN10** – ask patient to cough and to say 'Aaah' (**PALATAL SOUNDS**)

Ask the patient to count steadily to 30 - to assess for *muscle fatigue*.

### **THERAPY**

- generally focuses on teaching *compensatory strategies* and *self-correction of errors*.
- *exercises of* oral, lingual, buccal, and laryngeal *musculature* may increase physiologic support for speech.

## **DYSPHONIA**

- inability to vocalize (loss of voice - breathy sound);
- due to **disorder of LARYNX or its innervation** (abnormal apposition of vocal cords).

### VOCAL CORD DYSFUNCTION / PARALYSIS

1. Laryngitis
2. Damage to superior laryngeal nerve
3. Nodules, polyps, carcinoma.
4. Muscle paralysis or fatigability (after excessive speaking).

### SPASMODIC DYSPHONIA

- **dystonic spasms** of laryngeal muscles:

- a) **ADDUCTOR type** (most common form) - voice is strained (effortful, strangled), high-pitched, punctuated by repetitive brief interruptions of speech.  
H: botulinum toxin injection into thyroarytenoid muscle
  - b) **ABDUCTOR type** - voice has whispering, breathy quality.  
H: botulinum toxin injection into posterior cricoarytenoid or cricothyroid muscles - technically more difficult → less satisfactory results
- patient may employ certain "*tricks*" to *briefly overcome dystonia*, presumably by using other motor pathways to accomplish desired movement (e.g. some patients may find their voice nearly normal when singing or shouting).
  - cause - basal ganglia dysfunction.
  - rare nonprogressive syndrome.
  - occurs in middle aged - elderly individuals.

## DYSARTHRIA

- **lack of motor control over PERIPHERAL SPEECH ORGANS** – consistent disturbance in *articulation* of individual sounds:

- a) labials (n. facialis) – M, B, P
- b) gutturals (n. vagus)
- c) linguals (n. hypoglossus) – T, D, L

### FLACCID dysarthria (s. LMN dysarthria, BULBAR PARALYSIS)

- speech is slurred and progressively less distinct.
- special difficulty in **vibrative letters** (such as "R").
- bilateral palate paralysis → *nasal quality* speech.
- vocal cord paralysis → *raspy quality* speech.
- facial diplegia → impaired **labials**.
- tongue paralysis → impaired **linguals**.
- in myasthenia gravis speech worsens as patient continues to speak.

### SPASTIC dysarthria (s. UMN dysarthria, PSEUDOBULBAR PARALYSIS)

- harsh, low-pitched, slow, monotonous verbal output that sounds strained or strangled ("Donald Duck" speech).
- may occur with *nonfluent aphasia* (particularly Broca aphasia).

### ATAXIC dysarthria

- **cerebellar** disease.
- slowness of speech, altered rhythm, irregular breakdowns, improper stress - uneven, jumpy (staccato), unpredictable output.
- disturbed *speech & respiration coordination*:
  - a) not enough breath to utter certain words or syllables.
  - b) greater strength than intended (*explosive speech*).
- SCANNING SPEECH - **disrupted PROSODIC quality** - slow, deliberate, segmented (unnatural separation of syllables), monotonous speech;
  - normal grammatical and semantic competence, normal articulation;
  - lesion at **decussation of brachium conjunctivum** in mesencephalon (crossed efferent cerebellar pathways).
  - part of **Charcot triad** [ataxia, nystagmus, scanning speech] - historically considered to be pathognomonic for *multiple sclerosis*, but more common with *head injuries*.

### HYPOKINETIC / HYPERKINETIC dysarthria

- **extrapyramidal** disease.
- 1. **Hypokinetic dysarthria** (Parkinson and other rigid types of extrapyramidal disorders) - rapid utterances, word slurring, decrescendo volume at ends of sentences; voice is low pitched and monotonous, lacking both inflection and volume (hypokinetic and hypophonic); in advanced states only whispering is possible.
- 2. **Hyperkinetic dysarthria**:
  - a) **choreiform dysarthria** (choreiform disorders, myoclonic disorders) - BURSTING SPEECH: prolonged phoneme and sentence segments, intermixed with silences; variable, often improper, stress (phoneme inflections).
  - b) **dystonic dysarthria** (in dystonia musculorum deformans) - slower rate, prolongation of individual phonemes and segments; unexpected appearances of stress or silence.

### MIXED dysarthrias

- combination of spastic, flaccid, ataxic, and hypokinetic / hyperkinetic dysarthrias.
- common (e.g. multiple sclerosis, Wilson's disease, advanced amyotrophic lateral sclerosis).

## MUTISM

- **total loss of speech**.

- 1) most often involves **upper motor neurons**.
  - **aphasic** patients frequently present with *initial mutism*.
  - *persistent mutism* is associated with bihemispheric involvement (particularly of mesial **frontal lobes**).
  - **bilateral dysfunction of upper brain stem or frontal septal area** – lost initiation of both behavior and verbal output (AKINETIC MUTISM).
- 2) mutism can also be **psychogenic**.

# SPEECH-RELATED DISORDERS

1. Phonic tics and vocalization
2. Reiterative speech:
  - a. Echolalia
  - b. Palilalia
  - c. Stuttering
  - d. Logoclonia

## PHONIC TICS & VOCALIZATIONS

- involuntary sounds:

- A. **Simple vocal tics** - similar in character to motor tics (inarticulate noises and sounds - throat clearing, grunts, coughs, shouts, snorts, word accentuation).
- B. **Complex vocal tics** - articulate words, phrases, sentences (e.g. echolalia, coprolalia).

Etiology:

1. Gilles de la Tourette syndrome.
2. Degenerative diseases of nervous system (e.g. neuroacanthocytosis, Huntington's disease)
3. Neuroleptic medication.

## REITERATIVE SPEECH DISTURBANCES

[*angl.* **reiterative** – kartotinis]

### Echolalia

- mandatory tendency to **repeat what has just been said by examiner**.
- fully developed echolalia encompasses *entire phrases and sentences*.
  - patient apparently **unaware** of what he or she is saying.
  - most have COMPLETION PHENOMENON - if started on phrase that is not completed (red, white, and \_\_\_\_\_), correct word is supplied by patient automatically.
  - most often encountered in **transcortical aphasias** (esp. transcortical sensory and mixed transcortical); also in many **degenerative brain diseases**.

### Palilalia

- involuntary **repetition of words / phrases during verbal output**.

Etiologic associations:

- 1) some aphasias.
- 2) basal ganglia involvement
- 3) untreated schizophrenia
- 4) paramedian thalamic damage
- 5) later stages of degenerative brain diseases (e.g. Alzheimer's disease)
- 6) electrical stimulation of left hemisphere sites.

### Logoclonia

- tendency to **repeat final syllable of word**.

- indicates bilateral brain dysfunction (e.g. later stages of dementia).

## Stutter

- difficulty in producing smooth flow of speech - multiple rapid **iteration of uttered partial-word** (not whole word!)

- associated with **right cerebral dominance** and **widespread overactivity of cerebral cortex & cerebellum**.
  - includes overactivity of **supplementary motor area** (stimulation of this area produces **laughter**, with duration and intensity proportionate to stimulus intensity).
- A. **Developmental stutter** - common (particularly among *developing males*; accompanied by **physical & emotional discomfort**) - involuntary repetition of **first syllable** of word; initiation of word is followed by:
- a) machine gun-like repetition (STUTTER)
  - b) prolonged silence (STAMMER).
    - by late childhood, many children recover from stuttering.
- B. **Acquired stutter** - repetitions and prolongations **not restricted to initial syllable**; patient **does not exhibit anxiety** associated with difficult performance - bilateral brain dysfunction (no focal neuroanatomical site).

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