Neurogenic Communication Disorders

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Preliminaries

• Language
  – Symbolic, dualistic, creative communication code composed of phonology, lexicon, grammar, semantics, and pragmatics
  – Cortical
• Speech
  – One type of language output involving oral tract
  – Comparable to writing, signing, typing

Preliminaries

If abnormal speech or language presents:
• Must r/o old deficit
• Must r/o dialectal, education, or experiential factors
• Must r/o unrelated medical problems such as hearing impairment, edentulousness, or intoxication

Aphasia

• acquired language disorder that is a CNS disturbance of the capacity to interpret and formulate symbols for communicative purposes
• secondary to focal brain damage
  – perisylvian region
  – dominant hemisphere
  – not due to diffuse or multifocal dysfunction

Aphasia

• characterized by impairment in connected speech and conversation, auditory comprehension, repetition, naming, reading, & writing

Aphasia is not:

• dysarthria
• apraxia of speech
• language of confusion/delirium
• due to psychiatric disease
• due to primary cognitive dysfunction
Comatose patients are not aphasic

Assessment of Aphasia:
Informal

- Conversation & Connected Speech
  - fluent
  - hyperfluent (logorrhea or press of speech)
  - nonfluent
  - grammatic/paragrammatic/agrammatic
  - empty
  - Appropriate (no dyspragmia)

- if there is only minimal speech
  - automatic series (counting, days of week)
  - singing
  - does the patient engage linguistically

Assessment of Aphasia:
Informal

- Auditory Comprehension
  - commands
    - 1 part
    - 2 part
    - 3 part
  - yes/no questions with known answer
    - orientation
    - bizarre
    - complex

Assessment of Aphasia:
Informal

- Repetition
  - repeat sentences
    - "No ifs, ands or buts"
    - "They heard him speak on the radio last night"
  - repeat words
    - vary length and familiarity

Assessment of Aphasia:
Informal

- Word Retrieval
  - confrontation
    - name objects
    - name parts of objects
  - responsive
    - answer questions
Assessment of Aphasia: Informal

- Word Retrieval Errors
  - paraphasias: word substitutions
  - circumlocutions: talk around target
  - neologisms: non-words
  - stereotypy: restricted subpropositional forms (often yes & no)
  - frank dysnomia: no response or do not know

Assessment of Aphasia: Informal

- Reading Comprehension
  - silent reading of command
  - silent reading of yes/no question
  - oral reading is not reading comprehension any more than dictation or copying are written expression
  - If reading comprehension compromised, assess oral reading

Assessment of Aphasia: Informal

- Written Expression
  - generate sentence given stimulus word
  - automatic writing (e.g. signature) is not written expression
  - If writing impaired, assess taking dictation, then copying of words or figures

Boston Aphasia Classification

- Relative sparing vs. relative impairment
- Reading and writing always impaired
- Differentiate aphasias in
  - fluency
  - auditory comprehension
  - repetition
  - naming

Taxonomy of Nonfluent Aphasias

<table>
<thead>
<tr>
<th>Aphasia</th>
<th>Fluency</th>
<th>Comprehension</th>
<th>Repetition</th>
<th>Naming</th>
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<tbody>
<tr>
<td>Broca</td>
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<td>Impaired</td>
<td>Impaired</td>
<td>Impaired</td>
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<tr>
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Taxonomy of Fluent Aphasias

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<tr>
<td>Wernicke</td>
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<td>TSA</td>
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<td>Anomic</td>
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<td>Spared</td>
<td>Impaired</td>
</tr>
</tbody>
</table>
Disclaimers & caveats re: aphasia taxonomy

- Receptive/expressive dichotomy invalid
  - all aphasias have an expressive component
  - all aphasias have a receptive component
- If you are binary, use the fluent/nonfluent dichotomy

Cortical Organization of Language

Localization of Classical Aphasias

- **Broca**: third left frontal convolution
- **Global**: entire perisylvian region
- **Transcortical Motor**: anterior watershed
- **Mixed Transcortical**: anterior watershed & posterior watershed
Localization of Classical Aphasias

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Localization of Classical Aphasias

- **Wernicke:** posterior, superior temporal lobe
- **Conduction:** arcuate fasciculus; inferior parietal lobe
- **Transcortical sensory:** posterior watershed
- **Anomic:** posterior: temporoparietal?
Localization of Classical Aphasias

- Wernicke: posterior, superior temporal lobe
- Conduction: arcuate fasciculus; inferior parietal lobe
- Transcortical sensory: posterior watershed
- Anomic: posterior: temporoparietal?
**Subcortical aphasia**
- Thalamic Aphasia
- Left caudate, putamen, ALIC Aphasia
- Variable symptoms

**Nonaphasic Language Disorders**
- TBI
- Minor hemisphere CVA
- Dementias & Primary progressive aphasia
- Diffuse & multifocal neurological deficits (encephalopathies)
- Seizures
- Psychogenic dysfunction

**Neurogenic Speech Disorders**
- Motor Speech Disorders: disorders in speech resulting from neurological impairment affecting motor programming or neuromuscular execution of speech
  - Apraxia of Speech
  - Dysarthrias

**Dysarthria**
- group of speech disorders
- neurogenic
- associated with a variety of CNS, PNS, & muscle pathologies

**Motor Speech Evaluation**
- Cranial Nerves
- Phonation
- Diadochokinesis with syllables
  - p  CN VII
  - t  CN XII
  - k  CN XII
  - pataka
- Word & Sentence repetition
- Conversation
- Intelligibility
- Forced counting
**Characteristics of UMN vs. LMN lesions**

- **LMN**
  - Imprecise
  - Weak
  - Hypernasal
  - Atrophy
  - Fasciculations
  - Breathy or hoarse voice
  - Sometimes tremor
- **UMN**
  - Slow
  - Spastic
  - Strained-strangled voice
  - Pseudobulbar affect
  - Abnormal reflexes

**Dysarthrias**

- **Flaccid**
  - lower motor neuron lesion
  - Imprecise diadochokinesis
- **Spastic**
  - bilateral upper motor neuron lesions
  - Slow diadochokinesis
- **Ataxic**
  - cerebellar lesion
  - Dysrhythmic diadochokinesis

**Dysarthrias**

- **Hypokinetic**
  - extrapyramidal lesion
  - Reduced ROM & festination (as in Parkinson’s)
- **Hyperkinetic**
  - extrapyramidal lesion
- **Unilateral Upper Motor Neuron**
  - Variable symptoms
- **Mixed**
  - e.g., flaccid-spastic dysarthria of ALS

**Apraxia of Speech**

- disorder of motor planning
- absence of aphasia & neuromotor deficits
- characterized by symptom variability
  - mutism
  - difficulty initiating speech
  - problems in syllable transition
  - more difficulty in volitional than automatic
  - more difficulty in long than short
  - more difficulty in complex than simple

**Cranial Nerves**

- **Diadochokinesis with /pataka/**
- progressively longer words
- **automatics vs. volitional speech**
- **nonverbal oral movement**

**Evaluation of AOS**

- **Apraxia of Speech**
  - Often
    - articulatory struggle
    - phoneme metathesis
    - syllable transposition

- **Evaluation of AOS**
  - **Cranial Nerves**
  - **Diadochokinesis with /pataka/**
  - **progressively longer words**
  - **automatics vs. volitional speech**
  - **nonverbal oral movement**
Treatment in a Nutshell

- Speech therapy is efficacious for neurogenic communication disorders
- It must be of sufficient frequency
- It should be initiated early
- Therapy
  - Speaker oriented (medical, pharmacologic, surgical, prostheses, behavioral)
  - Communication oriented
  - Counseling
- Consult a SLP to determine most effective course