An Overview of Communication Disorders and Swallowing

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STROKE

Stroke/Brain Injury
• Site of lesion(s) is/are critical in a complete assessment
• Co-morbidities play an important role
• Patient baseline (education and level of independence)
• Family support
Deficits/Interventions

<table>
<thead>
<tr>
<th>Manifestations</th>
<th>Left Hemisphere Damage</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paralysis or Paralysis</td>
<td>Right side</td>
<td>Involve affected side during ADLs</td>
</tr>
<tr>
<td>Major Deficits</td>
<td>Right visual field loss; language deficits</td>
<td>Communication tools and treatment provided by the SLP</td>
</tr>
<tr>
<td>Thought Processes</td>
<td>Has difficulty listening and processing information</td>
<td>Be patient, give frequent breaks, speak slowly</td>
</tr>
<tr>
<td>Emotional Style</td>
<td>Easily frustrated or depressed; aware of deficits</td>
<td>Be patient, offer encouragement</td>
</tr>
<tr>
<td>Attention Span</td>
<td>Usually normal</td>
<td>Limit sessions, care, or tx based on individual need</td>
</tr>
<tr>
<td>Behavioral Style</td>
<td>Slow and cautious; needs encouragement</td>
<td>Allow plenty of extra time to work with the client; don’t appear rushed</td>
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Classification of Aphasia

Non Fluent vs. Fluent Aphasia

- Non fluent: limited verbal expression
  - Halting speech
  - Telegraphic speech
  - Lacking grammar
  - Reading and writing are also impaired

- Fluent: use of lengthier utterances
  - May be devoid of meaning (i.e. jargon)
  - Frequent speech errors
  - Poor awareness of errors
Anomic Aphasia

- Fluent aphasia
- Fluency occurs in grammatical form. Coherency weakened by word retrieval errors (i.e. circumlocutions)
- Persistent inability to supply the specific words needed for topic, particularly nouns and verbs
- Is often the major language residual following recovery
- Auditory comprehension is intact
- Varying lesion sites of the left hemisphere

Conduction Aphasia

- Fluent aphasia
- Repetition is poor and phoneme substitutions are frequent with word finding difficulties
- Writing is impaired
- Reading comprehension (silent) is spared but not verbal reading ability
- Comprehension and articulation is good
- Lesion of the white matter pathways that connect Broca’s and Wernicke’s area - arcuate fasciculus

Transcortical Sensory Aphasia

- Rare, fluent, receptive aphasia
- Most striking features are the ability to repeat and echolalia
- Comprehension is poor
- Reading, writing and naming are poor
- Lesions of sensory association areas surrounding Wernicke’s area
Wernicke’s Aphasia
- Fluent, receptive aphasia
- Poor auditory comprehension
- Oral expression with paraphasic errors and jargon with no awareness of errors
- Damage to the region of the auditory association cortex of the superior temporal lobe (Wernicke’s area)
- May have normal articulation and syntax but abnormal semantics. Words are non-specific.
- Reading and writing often severely impaired

Transcortical Motor Aphasia
- Rare, non-fluent, expressive aphasia
- Good auditory comprehension
- Able to repeat fluently
- Absence of spontaneous speech (similar to Broca’s aphasia)
- Lesions surrounding Broca’s area

Broca’s Aphasia
- Non-fluent, expressive aphasia
- Speech limited to expression of high-frequency content words
- Good auditory comprehension
- Writing may be a means of expression
- Co-existing apraxia is common
- Left frontal lesion (Broca’s area)
Transcortical Mixed

- Profound impairment of language function in most modalities
- Intact/echolalic-like repetition
- Severe-profound comprehension deficits
- Watershed type brain damage
  - Pick’s Disease
  - Carbon Monoxide Poisoning

Global Aphasia

- Profound impairment of language function in all modalities.
- No functional speech (mute or repetitive)
- Severe-profound comprehension deficits
- Poor prognosis for recovery
- Large lesion in frontal and parietotemporal language areas

Video of aphasia

- https://www.youtube.com/watch?v=OGyOKItHS9Y//
SLP tx goal: Improving Communication

- Speak slowly using short phrases/sentences
- Give directions one at a time.
- Allow extra time between thoughts to give the aphasic patient time to process info.
- Pair verbal with non-verbal when speaking
- Avoid “twenty questions”, but provide yes/no or multiple choice
- Encourage gestures, drawing

Intervention Strategies

- Pharmacology
- Melodic Intonation Therapy
- Word Finding Strategies
- Written Cues
- Multi-modality Approach

RIGHT HEMISPHERE DYSFUNCTION
Right Hemisphere

Deficits/Interventions

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<td>Major Deficits</td>
<td>Left visual field deficits; displays visual, special, perceptual deficits, distorted body image; possible agnosia</td>
<td>Use repetition and one-step commands; approach on the left side and place objects in view past midline, orient them to the room</td>
</tr>
<tr>
<td>Thought Processes</td>
<td>Poor judgment; unrealistic thoughts; memory deficits; difficulty with concrete thinking</td>
<td>Safety is a concern; establish a routine; use a memory book or aide</td>
</tr>
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<td>Emotional Style</td>
<td>Labile; denial of deficits, socially inappropriate behavior</td>
<td>Cue to deficits; give constant reminders to call for help; supervise closely, redirect behaviors</td>
</tr>
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<td>Attention Span</td>
<td>Short; highly distractible</td>
<td>1:1 quiet work environment; keep sessions short</td>
</tr>
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<td>Behavioral Style</td>
<td>Quick and impulsive; needs supervision</td>
<td>Use alarms or monitoring to prevent injury</td>
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Nonverbal Deficits in RHD

- Lack of awareness of others' nonverbal communication
  - Facial expression
  - Eye contact
  - Gestures and proxemics (body-space awareness)
- Display a flat affect
Verbal Deficits in RHD

- Conversational initiations
- Conversational turn taking
- Topic maintenance/adherence
- Response length
- Presupposition
- Referencing
- Intonation

Behavior Changes

- Behavior changes
  - Impulsivity
  - Egocentricity
  - Quickness to try things
  - Risk taking
- Social inappropriateness
  - Sexual disinhibition
  - Inappropriate self-disclosure

Video of RHD

- Left neglect: https://www.youtube.com/watch?v=d4FhZs-m7hA
- https://www.youtube.com/watch?v=IoXtpvap-f0 (start at 54 seconds)
BRAINSTEM STOKES

Deficits post BS CVA

• Cranial nerve damage
• Double vision
• Ataxia/balance issues
• Attention
• Difficulty regulating BP, temp, breathing
• At its most severe: Locked In Syndrome
• CAS: Cognitive Affect Syndrome

MOTOR SPEECH DISORDERS
Motor Speech Disorder - Apraxia

- Movement-planning problem with difficulty putting the movements in the right order
- Example of error might be “tootie” or “feecoff” for coffee
- The errors are inconsistent and practice of error productions makes the speech worse
- The patient appears to grope with their lips and tongue
- Patients are usually frustrated due to awareness of the deficit
- Automatic speech is better than novel speech

Motor Speech Disorder - Dysarthria

- A group (at least 8) of speech problems resulting from disturbed or weak control of the muscles for speech
- Characteristics to be assessed:
  - Rate
  - Resonance
  - Articulation
  - Respiration
  - Prosody
  - Phonation

Compensation for Motor Speech Disorders

- May include one or some of the following:
  - Exaggerate mouth openings (over enunciate)
  - Let your listener look at your mouth to help them figure out what you are saying
  - Hold vowels to give your tongue time to get to the next sound
  - Repeat key words
  - If one word cannot be understood use a synonym
  - Use gestures to supplement what is said
  - Speak louder
  - Reduce speaking rate (talk slower)
  - Give the speaker the topic so that they can “fill in” what they do not understand based on what is being discussed and get a clearer picture of your intended message
  - THINK LOUD, THINK SHOUT!
Videos of motor speech disorders

• Dysarthria
  – https://www.youtube.com/watch?v=EHNSBo3SsmY&index=4&list=PLEvUP2ggbvpEJQu--Yq66KifBmlzpsQ
  – https://www.youtube.com/watch?v=_L9k0VnQAV8&index=38&list=PLEvUP2ggbvpEJQu--Yq66KifBmlzpsQ

• Apraxia of speech
  – https://www.youtube.com/watch?v=8GaSQAB8l5E

TRAUMATIC BRAIN INJURY

Cognitive Linguistic Deficits

Right CVA

MS

Encaphalopathy

Neurodegenerative Diseases

TBI

Metabolic issues
Cognitive-Linguistic Disorders Associated with TBI

- Decreased Attention and Concentration
- Decreased Memory
- Decreased Orientation
- Impulsiveness
- Executive Dysfunction

Executive Dysfunction

- Executive Dysfunction results from damage to the frontal lobes, subcortical structures, and white matter lesions.

Cognitive-Linguistic Domains of Executive Dysfunction

- Organization/Planning
- Mental Flexibility
- Initiation
- Complex Attention
- Working Memory
- Awareness
- Emotional Control
- Inhibition
- Self-Monitoring
- Problem Solving/Reasoning
Intervention Strategies

- Create checklists to guide performance
- Organize the room
- Highlight important information
- Identify potential obstacles prior to event
- Establish clear time goals
- Talk through each step
- Use multi-modalities—talk it out, write it down

Diagnoses of Patients Who May Exhibit Dysphagia

- Traumatic Brain Injury
- Cerebral Vascular Accident
- Neuromuscular Disease (i.e. MS, Guillain Barre)
- Anoxic Brain Injury
- Brain Tumor
- Cervical Spinal Cord Injury
- Cerebral Palsy

DYSFUNCTION =
Swallowing Anatomy

Cranial Nerves Involved in Swallowing

V: Trigeminal
VII: Facial
IX: Glossopharyngeal
X: Vagus
XII: Hypoglossal

*Data from the next 6 slides: Daniels & Huckabee, Dysphagia Following Stroke, 2008, pg. 74-76.

Trigeminal Nerve

Sensory: Sensory to face, hard palate, anterior tongue
Motor: Jaw opening to resistance, jaw lateralization, bite

Motor Innervation: Temporalis, masseters, medial and lateral pterygoids, anterior belly of digastric, mylohyoid, tensor veli palatini
Facial Nerve

Sensory: Taste to anterior 2/3 tongue, Sensory to soft palate and adjacent pharyngeal wall

Motor: Flattens cheeks, lateralisates and puckers lips

Motor Innervation: Posterior belly of digastric, stylohyoid, submandibular and sublingual glands, muscles of face and lips

Glossopharyngeal Nerve

Sensory: Gag reflex, estimation of onset of swallow

Motor: Gag Reflex

Motor innervations: Stylopharyngeus, taste and sensation to posterior 1/3 tongue and oral cavity, faucial arches

Vagus Nerve

Sensory: Reflexive cough

Motor: Vocal quality, volitional cough, glottal coup

Motor Innervation: Cricothyroid, intrinsic/extrinsic laryngeal muscles, sensory input to lower pharynx, larynx; cricopharyngeus
Pharyngeal Plexus (IX & X)

- Sensory and Motor see above for IX and X
- Motor Innervation: Superior, middle, and inferior pharyngeal constrictor, palatoglossus, palatopharyngeus, salpingopharyngeus, levator veli palatini

Hypoglossal Nerve

Motor only: Lingual movement: superior, lateral, protrusion, retraction

Motor Innervation: Intrinsic; Extrinsic muscles of tongue genioglossus, styloglossus, hyoglossus, strap muscles and geniohyoid (when paired with C1-C2)

The Power of Three!

- Three major swallowing stages
- All 3 must work together to elicit a normal swallow
- Takes 3 seconds to complete all 3 stages in a normal swallow.
### Oral Preparatory-1
- Point from which food or liquids are presented to the oral cavity
- Food is broken down in preparation to form a bolus
- Focuses on lip closure, tongue movement, and jaw movement

### Oral Stage-2
- Propels a bolus from the anterior portion of the mouth to the posterior portion of the mouth
- Also focuses on the anterior-posterior movement of the tongue

### Pharyngeal Stage-3
- Begins when the swallow reflex is triggered
- Larynx elevates and tilts forward; vocal folds close to protect the airway
- Epiglottis folds over the airway to provide extra protection
- Muscles are attached from the larynx to the sphincter; as the larynx elevates the sphincter opens allowing material to pass through
Evaluation of Swallow: Clinical Observation

- Dysarthria/oral-motor weakness
- Abnormal volitional cough (weak or non-productive)
- Dysphonia
- Coughing noted before, during, or after the swallow
- Change in voice quality (volume or quality)

_A bedside swallow evaluation is only intended as a screening tool._

Overt Signs of Aspiration

- Wet vocal quality
- Coughing or throat-clearing

_Silent aspirators do not exhibit coughing and/or throat-clearing due to sensory impairments generally observed with brain stem lesions and right hemisphere CVA._

Aspiration/Efficiency
Modified Barium Swallow Study

- Used to identify anatomy and physiology of the swallow and determine safety and efficiency of oral intake.
- This is not a pass/fail test
- This is only a snap shot in time and not the only tool utilized to determine plan of care
- Aspiration can only be confirmed with an instrumental evaluation (not a bedside)

MBS Images

FEES

- Fiberoptic Endoscopic Evaluation of Swallowing
  - Observation of the anatomy involved in swallowing
  - Observation of the movement/sensation of the critical structures within the hypopharynx
  - Observation of secretions
  - Direct assessment of swallowing function for food and liquid
  - Response to therapeutic maneuvers and interventions to improve the swallow
Possible Swallowing Precautions

- Supervision during meals
- Thicker liquid consistencies (nectar or honey)
- Change in solids (puree, soft, chopped, ground)
- Give meds one at a time or crushed
- Oral hygiene before and after meals
- Repositioning for the patient
- Modify bite/sip size or bolus placement
- Add cold or sour bolus
- Chin tuck, Head turn/tilt, or Effortful swallow
Supplies at the Bedside

SLP Dysphagia Interventions

- Oral-motor strengthening/IOPI
- Positioning
- Thermal Stimulation
- Shaker Exercises or variant
- Masako Maneuver
- Mendelsohn maneuver
- Supraglottic or Super Supraglottic maneuver
- Facilitated Feedings
- EMST

Rationale for Repeating Instrumental Studies

- Diet upgrades, including liquids, for patients with sensory impairments
- Decline in medical status
- Change in cognitive status that may allow a patient to utilize compensatory strategies to facilitate improved swallowing skills
- Determine efficacy of treatment strategies and to modify goals as appropriate