Swallowing

What is Dysphagia?
- difficulty moving food from the mouth to the stomach
- also can include cognitive awareness, visual recognition of food, and physiologic responses

Aspiration
- the entry of food or liquid into the airway below the true vocal folds; also can include saliva
- silent aspiration is when aspiration occurs without producing a reflexive cough or other overt sign

Penetration
- entry of food or liquid into the larynx at some level down to but not below the true vocal cords
- (Logemann, 1998)

Strongest Predictors of Aspiration Pneumonia
- Dependence for feeding
- Dependence for oral care
- Number of decayed teeth
- Tube feeding
- Multiple medical diagnosis
- Smoking
- Reduced activity level
- GERD
- Esophageal dysmotility
- Aspiration of food
- Pharyngeal delay (Langmore et al., 1998)
Statistics

According to the American Speech Language Hearing Association (ASHA)
• 300,000 to 600,000 people in the US are affected by neurogenic dysphagia each year
• Studies have shown prevalence of dysphagia post stroke to be 25-70% of patients
• Research has shown patients with dysphagia are at increased risk for aspiration; aspiration increases risk for aspiration pneumonia
• Cost of care for the post stroke patient who develops pneumonia increases by $14,836.00

Statistics—continued

A retrospective study done by Garon, Sierzant, & Ormiston in 2009 found that of 2,000 patients, 51% aspirated on MBSS and of those patients, 55% had no protective cough reflex (silent aspiration)

Emphasized the need for early nursing dysphagia screens along with referral for formal dysphagia evaluation for stroke patients.

Ramsey et al. 2003 reported dysphagia in acute stroke patients is a marker of poor prognosis, increasing risks of chest infection, malnutrition, persistent disability, prolonged hospital stay, institutionalization on discharge and mortality. Also stressed importance of early screens and dysphagia assessments.

Swallowing

• very complex process
• use 50 pairs of muscles
• 6 cranial nerves for sensory and motor functions
• screening vs diagnostic procedure
• signs/symptoms of dysphagia/aspiration
## Cranial Nerves Involved in Swallowing

<table>
<thead>
<tr>
<th>nerve</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CN V- Trigeminal Nerve</strong></td>
<td>contains both sensory &amp; motor fibers that innervate the face</td>
</tr>
<tr>
<td><strong>CN VII- Facial Nerve</strong></td>
<td>both sensory &amp; motor fibers</td>
</tr>
<tr>
<td><strong>CN IX- Glossopharyngeal</strong></td>
<td>contains both sensory &amp; motor fibers</td>
</tr>
<tr>
<td><strong>CN X- Vagus</strong></td>
<td>contains both sensory &amp; motor fibers</td>
</tr>
<tr>
<td><strong>CN XI- Spinal Accessory</strong></td>
<td>motor function of soft palate, posterior tongue, &amp; pharynx</td>
</tr>
<tr>
<td><strong>CN XII- Hypoglossal</strong></td>
<td>contains motor fibers that primarily innervate the tongue</td>
</tr>
</tbody>
</table>

## Swallowing

4 phases of swallowing

- Oral Preparatory phase
- Oral Phase
- Pharyngeal Phase
- Esophageal Phase
Oral Preparatory Phase

- varies in time depending on consistency
- labial seal is maintained to prevent bolus loss
- liquid bolus is held between tongue & anterior hard palate; velum is pulled down & forward
- mastication-involves rotary lateral movement of the mandible and tongue
- tongue mixes food with saliva
- tension in buccal musculature closes off lateral sulcus to prevent loss of food particles

Oral Phase

- takes 1 to 1.5 seconds to complete
- posterior propulsion of the bolus to pharynx
- "stripping action" or anterior to posterior rolling action of the midline of the tongue
- tongue tip and sides remain firmly anchored against the alveolar ridge

Pharyngeal Phase

- takes <1 second
- pharyngeal swallow is triggered when bolus passes any point between the anterior faucial arches and the point where the tongue base crosses the lower rim of the mandible
- elevation & retraction of the velum-complete closure of velopharyngeal port
- elevation & anterior movement of the hyoid & larynx
- closure of the larynx-prevent material from entering airway
- opening of the cricopharyngeal sphincter
- ramping of the base of the tongue to deliver bolus to pharynx followed by tongue base retraction
- contraction in the pharyngeal constrictors from top to bottom
Communication following stroke—What do SLPs assess?

- Speech
- Voice
- Language
  - Verbal expression
  - Non-verbal expression
  - Auditory Comprehension
  - Visual Comprehension
  - Pragmatics
- Cognitive-Linguistics
  - Orientation
  - Attention
  - Memory
  - Verbal/Thought Organization
  - Planning, Sequencing, problem solving, reasoning, logic, calculations

Communication Deficits Following Stroke

- Aphasia
  - Expressive
  - Receptive
- Motor Speech Disorders
  - Apraxia
  - Dysarthria
- Dysarthria
- Cognitive-Linguistic Impairment

Aphasia

What is Aphasia?

- "an acquired communication disorder caused by brain damage that impairs a person's ability to understand, produce, and use language" (LaPointe, 2005).
- It does not affect intelligence.
- Affects reading, writing, and gestural language.
- More than 100,000 Americans acquire the disorder each year; most common cause is stroke-25-40% of stroke survivors (National Aphasia Association).
### Types of Aphasia

<table>
<thead>
<tr>
<th>Nonfluent Aphasias</th>
<th>Fluent Aphasias</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Broca's Aphasia</td>
<td>• Wernicke's Aphasia</td>
</tr>
<tr>
<td>• Transcortical motor Aphasia</td>
<td>• Transcortical Sensory Aphasia</td>
</tr>
<tr>
<td>• Isolation Aphasia</td>
<td>• Conduction Aphasia</td>
</tr>
<tr>
<td>• Global Aphasia</td>
<td>• Anomic Aphasia</td>
</tr>
</tbody>
</table>

#### Aphasia Types Continued

**Broca's Aphasia**
- Agrammatism
- short telegraphic speech
- effortful speech
- poor reading/writing
- Auditory comp relatively good

**Transcortical Motor Aphasia**
- Intact repetition
- short telegraphic sentences
- difficulty initiating responses

**Isolation Aphasia**
- Marked naming difficulty
- all areas severely impaired except repetition

**Global Aphasia**
- severely impaired in all language modalities
- difficulty with gestural skills

#### Aphasia Types Continued

**Wernicke's Aphasia**
- Fluent but meaningless speech
- Severe auditory comp
- Jargon, paraphasias, neologisms
- impaired reading, writing
- lack of awareness of errors

**Conduction Aphasia**
- marked repetition difficulty
- minor comprehension deficit
- aware of errors with attempts to self correct

**Transcortical Sensory Aphasia**
- resembles Wernicke's but intact repetition
- paraphasias

**Anomic Aphasia**
- Marked naming problems
- Circumlocution is common
- Near normal language
Tips for Communication

• Make sure you have their attention before communicating.
• Don’t talk “down” to someone.
• Keep information concrete, simple but adult.
• You don’t need to speak louder than normal, it is not a hearing problem.

Motor Speech Disorders

Apraxia
• Defined as “a neurogenic speech disorder resulting from impairment of the capacity to program sensorimotor commands for the positioning and movement of muscles for the volitional production of speech” (Duffy, 1995)
• It can occur without significant weakness or neuromuscular slowness
• Oral apraxia
• Verbal apraxia

Motor Speech Disorders

Dysarthria
• A group of speech disorders resulting from disturbances in muscular control over the speech mechanism due to damage of the central or peripheral nervous system
• Due to paralysis, weakness, or incoordination of the speech musculature
• Can affect respiration, phonation, resonance, articulation, and prosody
• Flaccid, Spastic, Ataxic, Hypokinetic, Hyperkinetic
  • (Duffy, 1995)
Right Hemisphere Dysfunction/Cognitive Linguistic Deficits

- Perceptual and Attentional Deficits
- Affective Deficits
- Communicative Deficits
- Cognitive Deficits