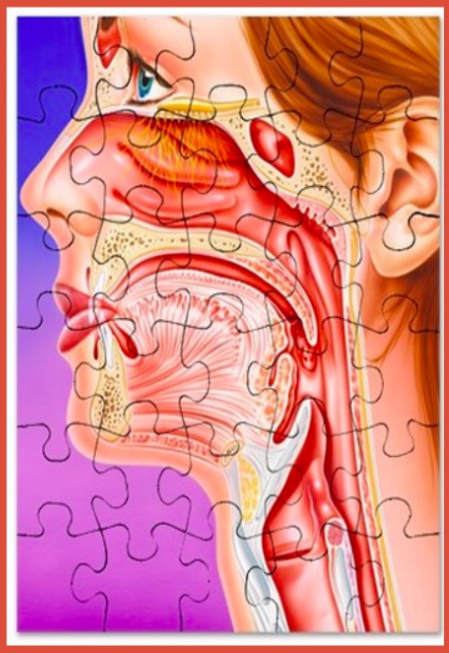
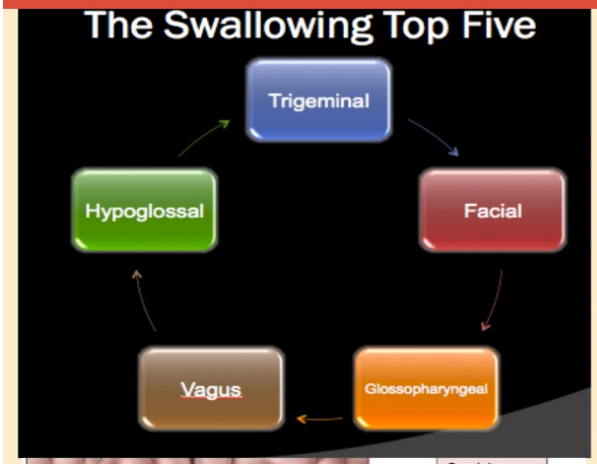
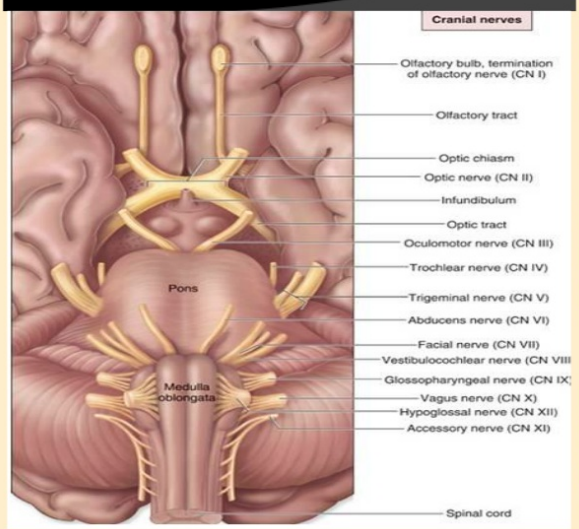


The Cranial Nerve Exam: Integrating Assesment and Treatment

Yvette M. McCoy, MS CCC-SLP, BCS-S

Putting It All Together: Dysphagia Basics Across A Continuum Of Care





Top cranial nerves involved in swallowing

*TRIGEMINAL CNV
Sensory: Sensation to face and mouth
Motor: Muscles of mastication biting/chewing

*FACIAL CNVII
Sensory: Taste to anterior 2/3 of tongue
Motor: Movement of facial muscles
Parasympathetic: Salivation (submandibular and sublingual glands)

*GLOSSOPHARYNGEAL CNIX
Sensor: Senses arrival of the bolus at the palate,taste (posterior 1/3 tongue and oral pharynx),Gag Reflex
Motor: Pharyngeal constriction and shortening (stylopharyngeus), Elevation of palate
Parasympathetic: Parotid gland

*VAGUS CNX
Sensory (90%):General sensation in oropharynx, Sensation of residue in pharynx, larynx, esophagus
Motor: Velopharyngeal Closure, Vocal Fold Approximation
Middle/inferior pharyngeal constriction, Pharyngoesophageal Segment Relaxation, Esophageal Peristalsis,Gag Reflex

*HYPOGLOSSAL CNXII
Motor ONLY
Power source for the tongue muscles
Hyoid-Thyroid Approximation
Hyoid Anterior Movement
Only nerve with contralateral innervation

SKILL

1. Creation of new “specialized neural groups”, enabling efficient and precise execution of skilled motor behavior, without muscle strength.

2. Acquisition of a skill through functional repetition and refinement of movement patterns.

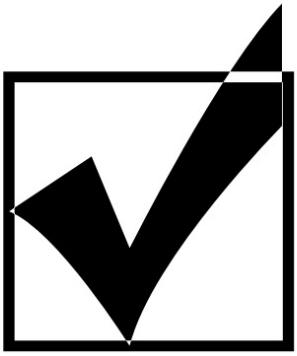
VS

STRENGTH

1. The exercise stimulus must be sufficient enough to elicit a change in muscle function. (stimulus intensity)

2. The frequency of the exercise stimulus, (how often it is performed) is crucial.

The FACTS

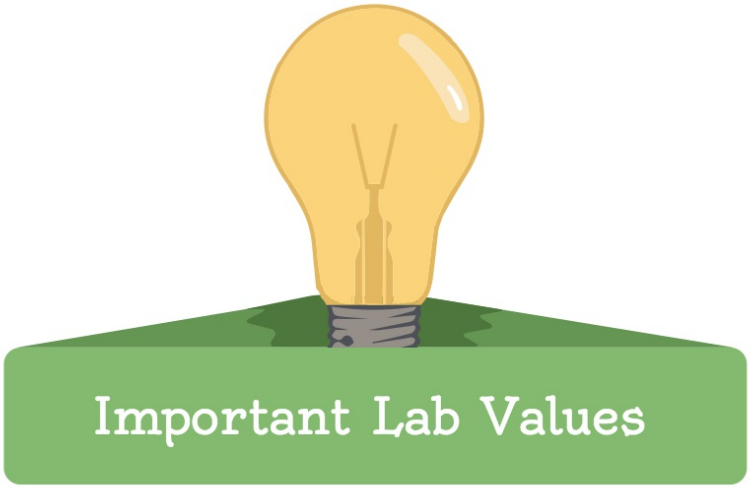


About Adjunct Modalities

*PENS (Patterned Neuromuscular Stimulation)
Uses electrical stimulation of sensory and motor nerves to achieve a muscle contraction using an EMG derived functional pattern.

*(Surface Electromyography): Record of electrical activity of a muscle or group of muscles (myoelectric activity)

*NMES (Neuromuscular Electrical Stimulation)
The use of electrical impulses that are modified and manipulated to excite peripheral nerves evoking an action potential through a transcutnaeous medium.



Important Lab Values

Albumin and PreAlbumin

*Hydration status and malnutrition
*Describes protein status of both internal organs and blood

Red Blood Cell, Hematocrit, Hemoglobin

*Malnutrition and other nutrient deficiencis, anemia

White Blood Cells Neutrophils

*Indicative of the bodies reaction to inflammatory response
*Neutrophils are first responders to acute infection and are highly present in the oral cavity
*Neutrophils are DIRECTLY related to immune systems response to bacteria

Blood/Urea Nitrogen (BUN), Creatine(Creat), Sodium(NA)

*Hydration and electrolyte status
*Critical lab value to check

*Patients may develop dysphagia due to the cognitive and neurological changes that may occur if these lab values are not within normal limits

Peripheral Oxygen Saturation (SpO2)

*Does NOT appear to be a clinically relevant marker of aspiration status (Leder 2000)
*Theoretical clinical significance because aspirators tend to have lower levels in general due to comprimised respiratory systems

3 Medications that can impact swallowing

Anticholinergics
Antihistamines

Barbituates
Diuretics

Antidepressants
Antipsychotics

An excellent resource for an exhaustive list of medications that can impact swallowing:
Carl, L.,Johnson,P.(2006) Drugs and Dysphagia: How Medications Can Affect Eating and Swallowing. Austin, Texas: Pro-ED

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