Dysphagia and Parkinson's Disease

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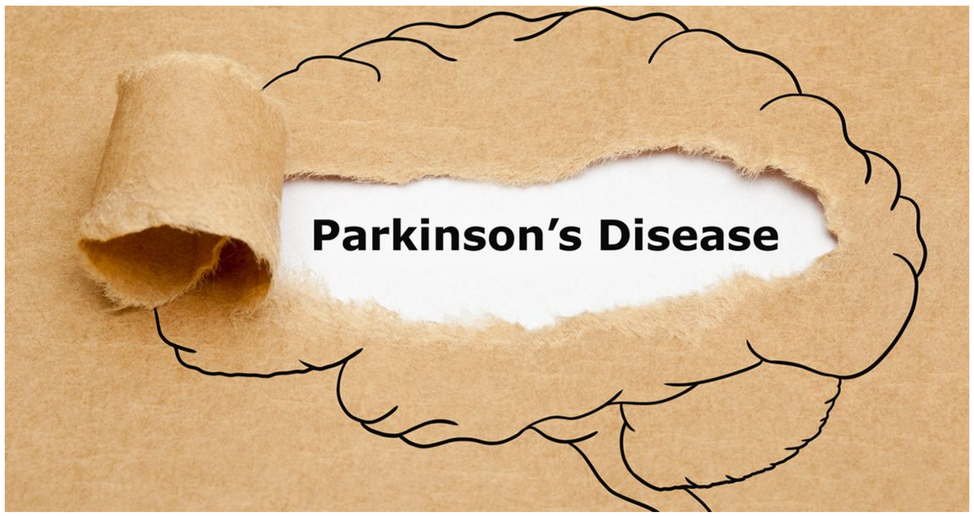
Parkinson’s Disease (PD)

“Parkinson's disease is a progressive nervous system disorder that affects movement. Symptoms start gradually, sometimes starting with a barely noticeable tremor in just one hand. Tremors are common, but the disorder also commonly causes stiffness or slowing of movement” (Mayo Foundation for Medical Education and Research, 2020).



Prevalence of PD

“The prevalence of the disease ranges from 41 people per 100,000 in the fourth decade of life to more than 1,900 people per 100,000 among those who are 80 and older” (Naqvi, 2018).

Etiology of PD

“The etiology of Parkinson's disease is not completely understood. It is thought to arise from a deficiency of dopamine in the substantia nigra, an area concerned with regulation of movement. Dopamine exerts an inhibitory effect on the basal ganglia, thus controlling extrapyramidal movement” (ScienceDirect Topics, Etiology of Parkinson’s Disease).

Staging of PD

- The Hoehn and Yahr Stages of PD
  - Stage 1 -- Symptoms are mild and unilateral with minimal functional impairment; tremors, rigidity or slowness of movement
  - Stage 2 -- Symptoms can impair bilateral movement; loss of facial expression or speech difficulties
  - Stage 3 -- Considered mid-stage; loss of balance or slowness of movement
  - Stage 4 -- Progression to a severely disability disease; may use a walker and difficulty with independent lifestyle
  - Stage 5 -- Confinement to a bed or wheelchair; higher risk of falling and may experience hallucinations

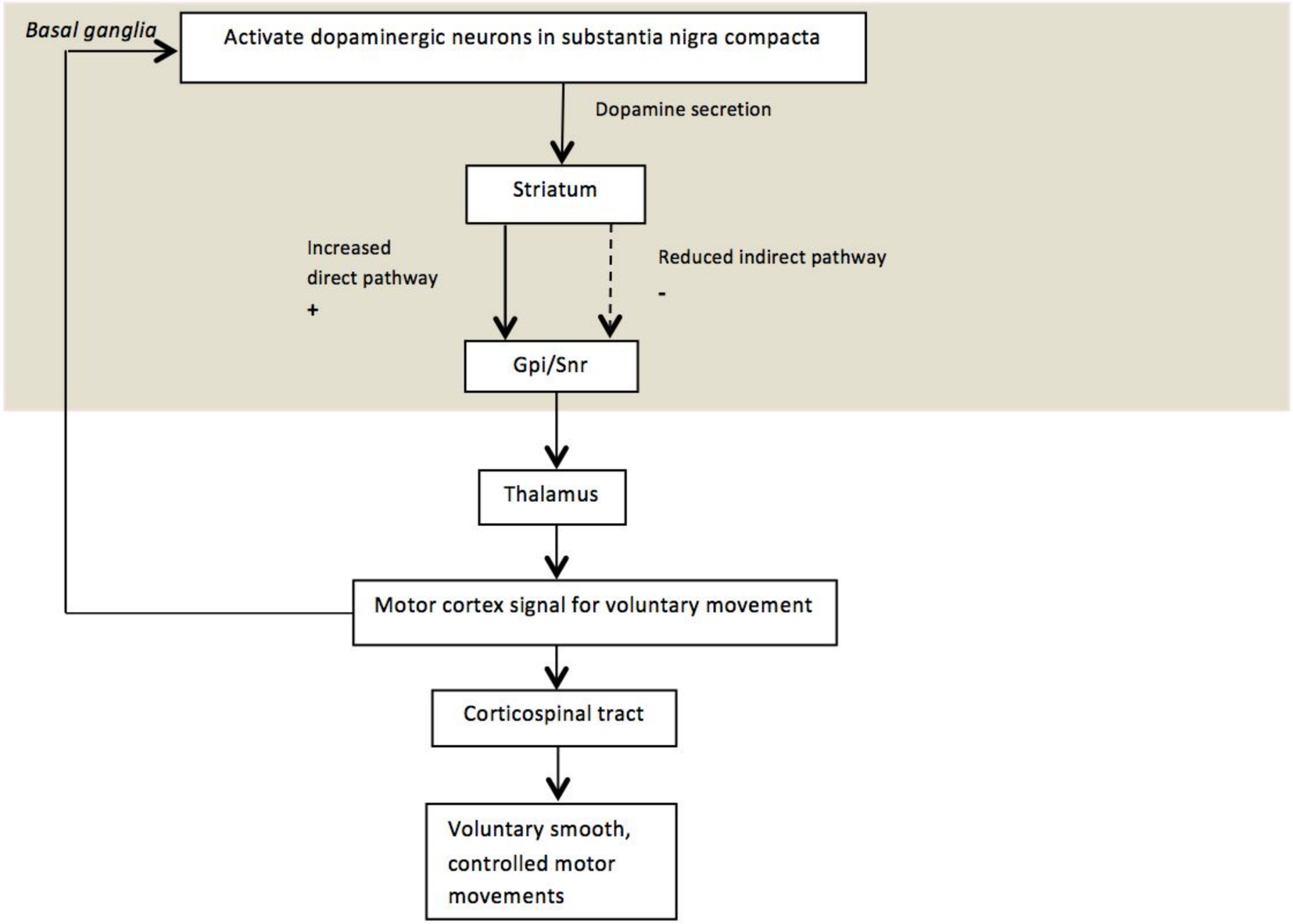
"The Hoehn and Yahr stages (1–5) only differentiate on the base of motor function, which is concordant with Braak stages III–VI. Therefore,research on early swallowing impairment and gastrointestinal dysfunction is limited by the inability to correctly identify patients in the prodromal stages of PD (Braak stages I–II)." (Suttrup, 2015, p.25).

Types of PD

- Idiopathic Parkinsonism
  - Most common type of parkinsonism; can cause tremors or slowness of movement
- Vascular Parkinsonism
  - Can restrict the blood supply to the brain; typically develops as a result of a mild stroke
- Drug-Induced Parkinsonism
  - Neuroleptic Drugs block the chemical dopamine that travels to the brain

(Parkinson's UK)

Pathophysiology of PD



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Diagnosis of PD

- Modified Barium Swallow Study (MBSS)
  - Goals of MBSS: To assess the efficacy and safety of oral food intake, to assure the patient was not experiencing aspiration, and to develop an individualized care plan for the patient post videofluoroscopic evaluation.
  - It is important that the speech-language pathologist (SLP) utilizes evidence-based assessments to address therapy goals
    - Use of barium sulfate suspension specifically labeled for MBSS
    - Patient must be seated in upright position
    - Presence of radiologist
    - Use of radiology protective equipment

(Martin-Harris, 2020)

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Intervention for PD

- Patients with PD are at high risk for laryngeal penetration and aspiration
  - Levodopa is a common medication to help control the motor movements
- MBSS can help to decide the safest treatment
- “Swallowing dysfunction is predominantly resistant to dopaminergic stimulation. They clinically support evidence that other neurotransmitters systems involved the neurological control and coordination of swallowing are damaged in Parkinson’s disease.”(Hunter, 1997, p.583).

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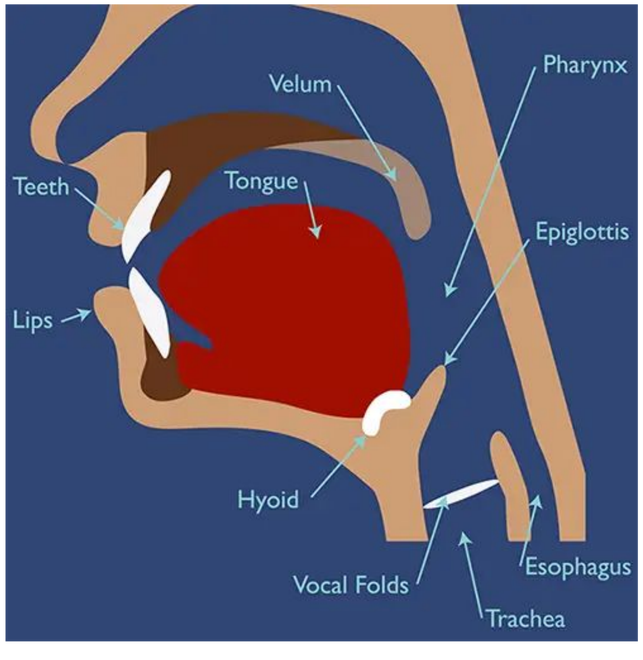
Dysphagia and PD

“Dysphagia is defined as problems involving the oral cavity, pharynx, esophagus, or gastroesophageal junction.” (ASHA).

“Dysphagia occurs in 72–87% of patients with Parkinson’s disease (PD) during the course of disease progression. However, only 16–55% of patients are thought to be aware of this complication” (Wakasugi, 2017, p.756).



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PD in Different Swallowing Phases

- A typical swallow consists of three stages:
  - Oral Stage
  - Pharyngeal Stage
  - Esophageal Stage
- “Impairment of the oral stage of swallowing is one of the most common motor symptoms in patients with PD and dysphagia” (Wakasugi, 2017, p. 756).

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Phases of swallow	Frequent findings
Oral phase	Repetitive pumping movement of the tongue
	Rocking-rolling festination movement of the tongue
	Oral residue
	Piecemeal swallow
	Difficulty of bolus formation
	Premature falling
Pharyngeal phase	Reduced tongue retraction and pharyngeal constriction
	Regurgitation of food into the nasal cavity or upper pharynx
	Difficulty in initiating and completing airway closure
	Penetration/aspiration
	Residue in valleculae and pyriform sinuses
	Reduced pharyngeal and laryngeal sensitivity
Esophageal phase	Reduced esophageal peristalsis

https://www.researchgate.net/figure/Characteristics-of-dysphagia-in-patients-with-parkinsonism_tbl1_336104557

Case Study

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Case Study

Patient is a 73 year old female diagnosed with PD approximately 3 years ago with chief complaint of coughing with liquids.

Medical History: Hyperlipidemia

Medications: Levodopa TID

Current Diet: Regular

Present Condition: Patient has mental capacity. Presents with caregiver as an outpatient for Modified Barium Swallow to evaluate oropharyngeal stages of swallowing and to rule out aspiration.

Hoehn and Yahr: Stage 1

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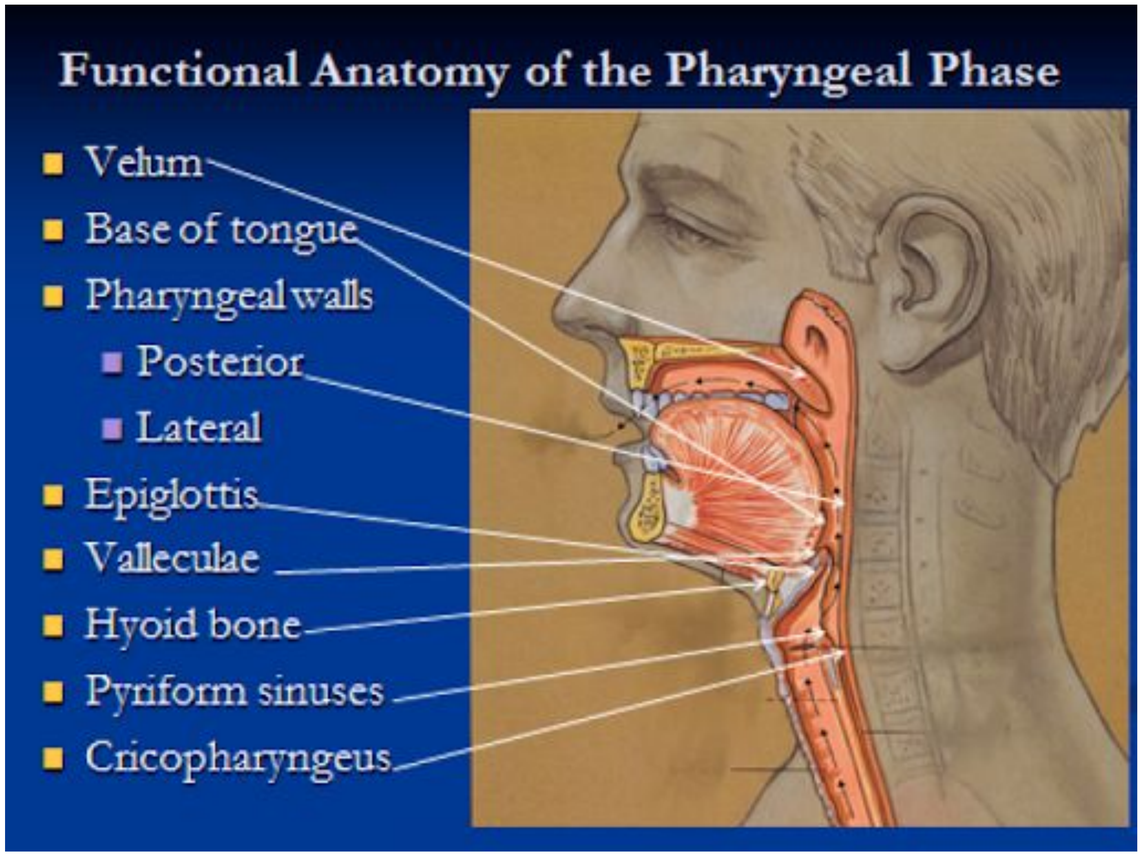
Case Study

Food and liquid items under fluoroscopy during the oral and pharyngeal phases of swallowing:

- Puree (Applesauce) -- normal residue in valleculae
- Nectar Thick -- no penetration or pooling, a lot of tongue movement in order to create the bolus
    - Nectar Thick with Straw -- little residue and pooling but cleared with the second swallow (volitional)
- Thin Liquids (Water) -- premature spillage into the pyriform sinus; second swallow no penetration
    - Thin Liquids with Straw -- pyriform sinus residual and mild laryngeal penetration. No aspiration.
- Dry Solids (Cookies) and Soft Solids (Peaches) -- normal



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Assessment

- Patient presents with mild oropharyngeal dysphagia, characterized by:
  - Increased oral prep time
  - Increased oral transit time
  - Delayed swallow reflex
  - Post-swallow pharyngeal residuals
  - Mild laryngeal penetration with thin liquids via cup and straw
  - Chin tuck was not effective in alleviating penetration
  - No aspiration observed

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Treatment Goals and Compensatory Strategies

- International Dysphagia Diet Standardization Initiative (IDDSI): Level 7 diet (Regular) with level 2 mildly (nectar) thick liquids
- Thin liquids via teaspoon only
- Caregiver educated
- Educated on where to purchase thickener
- Outpatient speech therapy
- Incorporate dysphagia remediation
- Compensatory strategy training

(Martin-Harris, 2020).

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Outcome of Session

- Successful session:
  - SLP identified patient had no aspiration on MBSS. High probability that experiencing deep laryngeal penetration and/or aspiration with liquids based on coughing episodes while drinking.
  - SLP determined what food and liquid modifications were necessary for patient to eat and drink safely.
  - Referral to outpatient speech therapy program

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