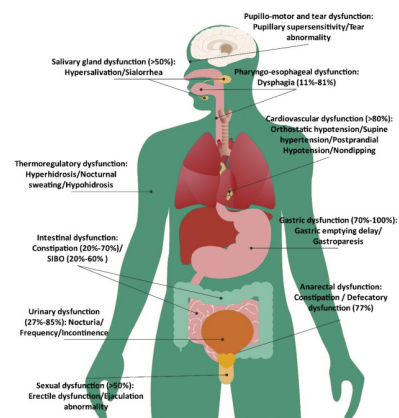


GASTROINTESTINAL DISORDERS AND NUTRITIONAL CONSIDERATIONS IN NEURODEGENERATIVE DISORDERS

ODINACHI OGUH M.D

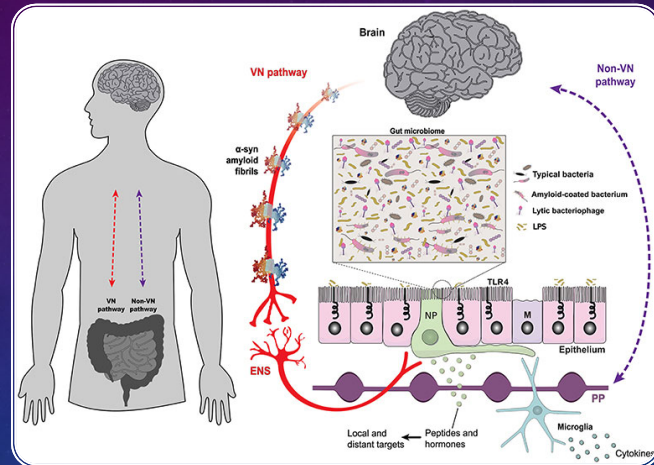
AUTONOMIC DYSFUNCTION



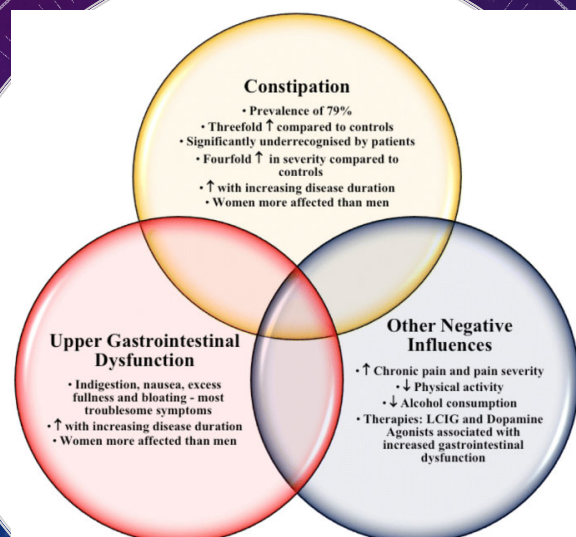
PATHOMECHANISM

- MULTIFACTED
- reflected not only the involvement of the intrinsic innervation of the gut presence of synuclein pathology in the
- Enteric neurons produce a substantial amount of DA which regulates normal gut motility
- Interestingly, slowed GI transit and decreased gut contraction in PD patients occur via altered DA-ENS circuitry, which normally promotes the peristaltic reflex.
- Extrinsic inputs because of the presence of Lewy pathology in the dorsal motor nucleus of the vagus, sacral parasympathetic nuclei, and sympathetic ganglia

• Andr e-Anne Poirier, Benoit Aub , M lissa C t , Nicolas Morin, Th r se Di Paolo, Denis Soulet. "Gastrointestinal Dysfunctions in Parkinson's Disease: Symptoms and Treatments", Parkinson's Disease, vol. 2016, Article ID 6762528, 23 pages, 2016. <https://doi.org/10.1155/2016/6762528>



GASTROINTESTINAL SYMPTOMS



UPPER GASTROINTESTINAL SYMPTOMS

Dysphagia → defines swallowing disorder

Changes associated with neurodegenerative disease can affect every stage of the swallow

Changes occur because of decreased force of movement, decreased range of motion, slowness of movement and a decreased ability to adapt to changes in volume and consistency of foods and liquids, as well as changes in reflexes involved in swallowing and airway protection

Dysphagia has real health consequences → weight loss, reduced quality of life, and aspiration pneumonia

Dysphagia can also be linked to social isolation

LOWER GASTROINTESTINAL SYMPTOMS

Abdominal pain or discomfort

Bloating or distension

Diarrhea

Constipation

Accidental stool leakage or incontinence

Problems in the passage of food or stool

Any combination of these symptoms

HISTORICAL CONSIDERATIONS

Coughing while or shortly after eating

Gurgly or "wet" vocal quality

Excessive watery eyes, nasal

drainage, sneezing at meals

Difficulty chewing

Needing to swallow many times per bite or sip

Food remaining in mouth after swallowing/difficulty clearing food from sides of mouth

Taking longer and longer to finish a meal

Drooling

Losing food or liquids from the mouth

Frequent heartburn

Complaints of food getting "stuck" or difficulty with certain consistencies, complaints of globus (lump in throat)

Anxiety / Agitation while eating

Unplanned weight loss

Difficulty swallowing pills

DYSPHAGIA

UPPER GI SYMPTOMS

Slowing down and reduction of the swallow response, resulting in drooling or repeated swallows being required in early stages of disease.

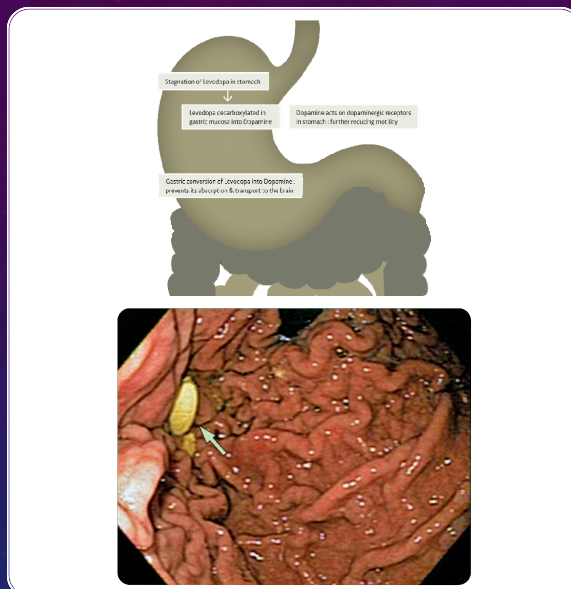
May worsen, which can be silent (not noticed) or associated with coughing, choking, or pneumonia.

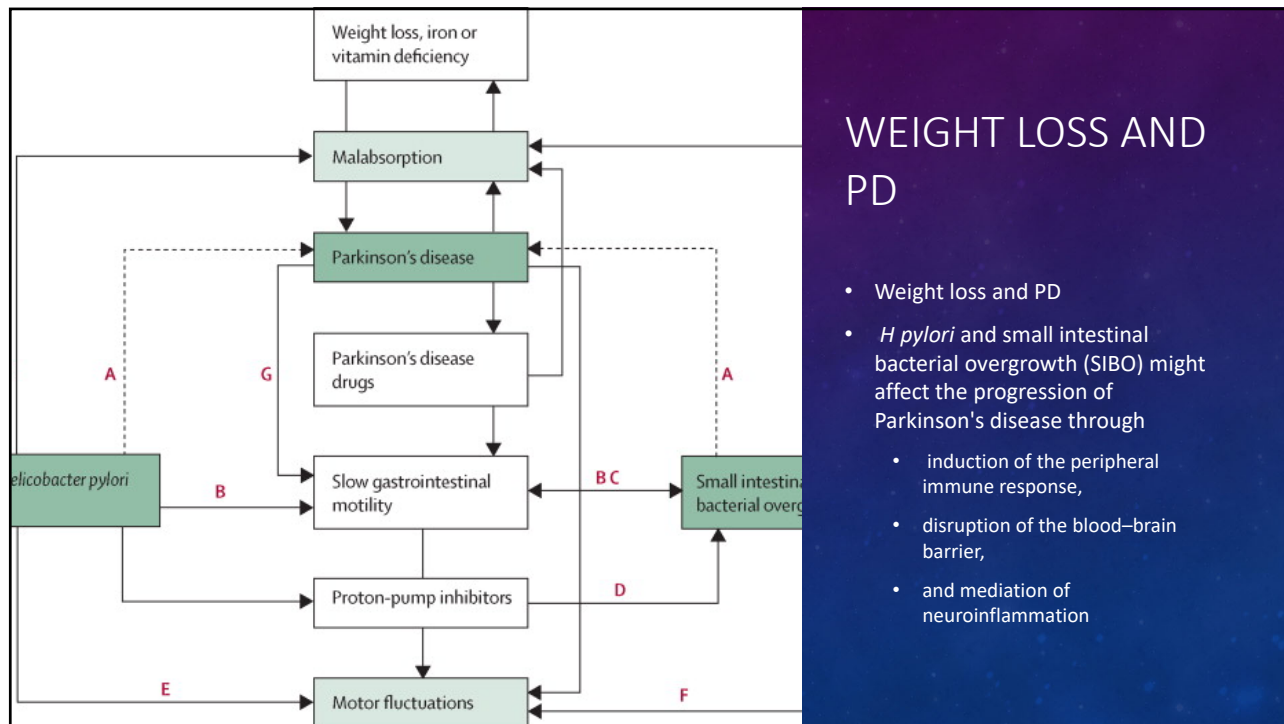
Stomach specific symptoms include bloating, indigestion, and early satiety, which typically reflect delayed stomach (gastric) emptying, sometimes known as gastroparesis.

GASTROPARESIS

GASTROPARESIS

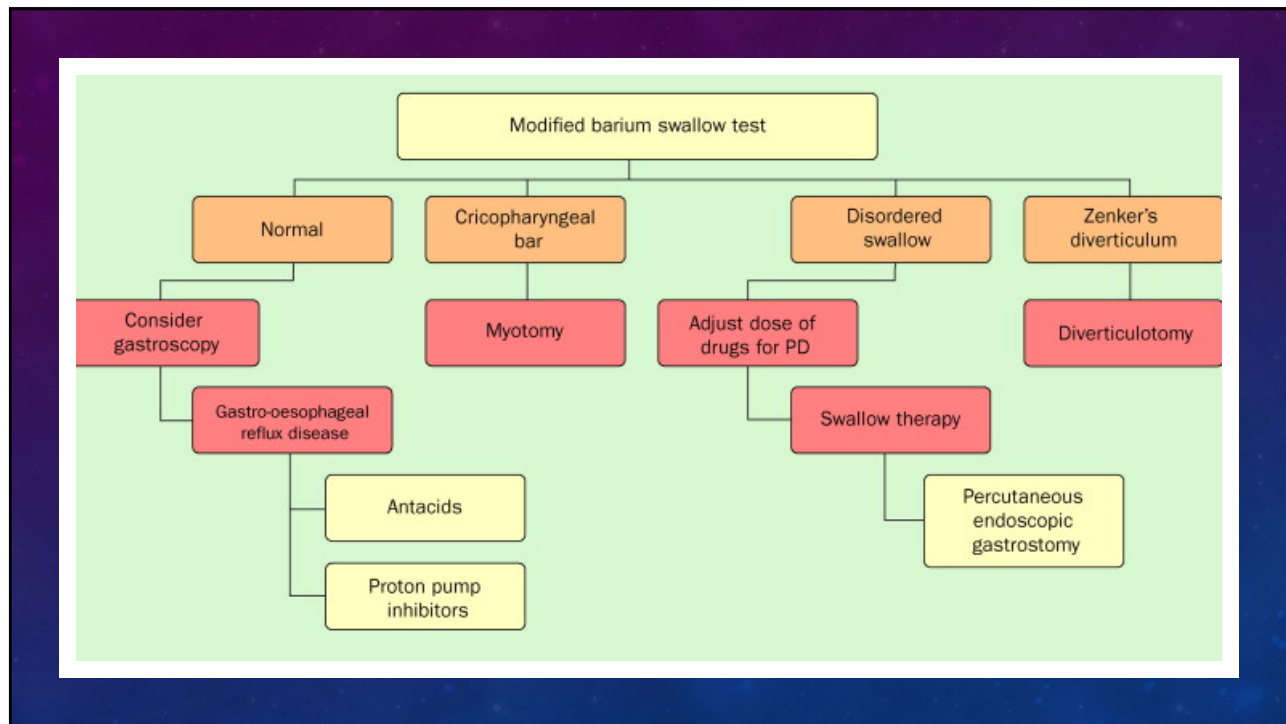
- Gastroparesis literally translated means “stomach paralysis”. Gastroparesis is a digestive disorder in which the motility of the stomach is either abnormal or absent
 - Symptoms of gastroparesis include bloating, nausea, early fullness while eating meals, heartburn, and epigastric pain. These symptoms are often referred to as dyspepsia.
 - Perhaps the most common symptom is early satiety, or the sensation of feeling full shortly after starting a meal.
 - Nausea and vomiting are also common.
 - Gastroparesis may regurgitate or vomit undigested food many hours after their last meal.
 - Weight loss can occur due to poor absorption of nutrients, or taking in too few calories.





DIAGNOSTIC TESTS

- Exclude secondary exacerbating medications
 - Narcotic
 - Tricyclic antidepressants
 - Calcium channel blockers
 - Clonidine
 - Dopamine agonists
 - Lithium
 - Nicotine
 - Progesterone
- Radiographic tests, endoscopic procedures, and motility tests are used to exclude obstruction, to view the stomach lining and obtain biopsies, and to examine muscle contraction patterns. These tests are described below
 - Upper Endoscopy
 - Gastric Emptying Study
 - Scintigraphic Gastric Accommodation
 - Gastroduodenal manometry
 - A Small Intestinal X-ray
 - Wireless capsule GI monitoring system (SmartPill®)



THERAPEUTIC CONSIDERATIONS

- Dysphagia and aspiration should be evaluated by a swallow study, performed by a speech therapist. Treatment recommendations include chewing more slowly, clearing one's throat before taking another bite, eating while sitting up with the chin tucked, and changing the texture of the solids and liquids to be easier and safer to swallow.

THERAPEUTIC CONSIDERATIONS

Suspected gastroparesis

Step 1: Diagnosis: 4 h Gastric emptying by scintigraphy

Step 2: Exclude iatrogenic disease
Dietary: low fat, low fiber diet
Glycemic control among diabetics

Step 3: Pharmacological Rx:

- Prokinetics: metoclopramide, erythromycin, domperidone
- Antiemetics: anti-histamine, receptors; 5-HT₃ antagonists

Step 4: Nutritional support: Enteral formula

Step 5: Non-pharmacological Rx
Pyloric injection of botulinum toxin
Venting gastrostomy, feeding jejunostomy
Parenteral nutrition
Gastric electrical stimulation
Pyloroplasty
Partial gastrectomy

CONSTIPATION

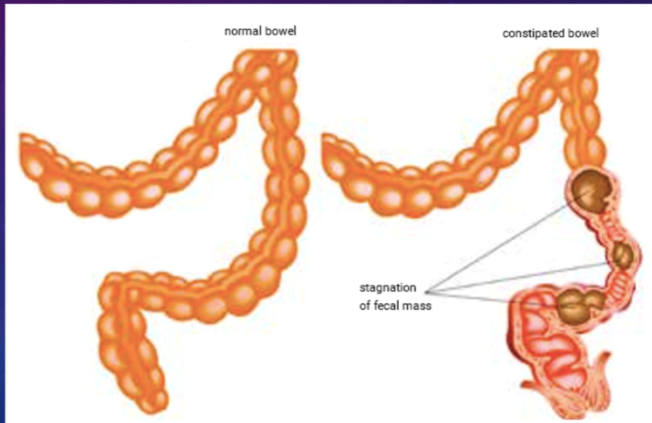


SLOW TRANSIT CONSTIPATION

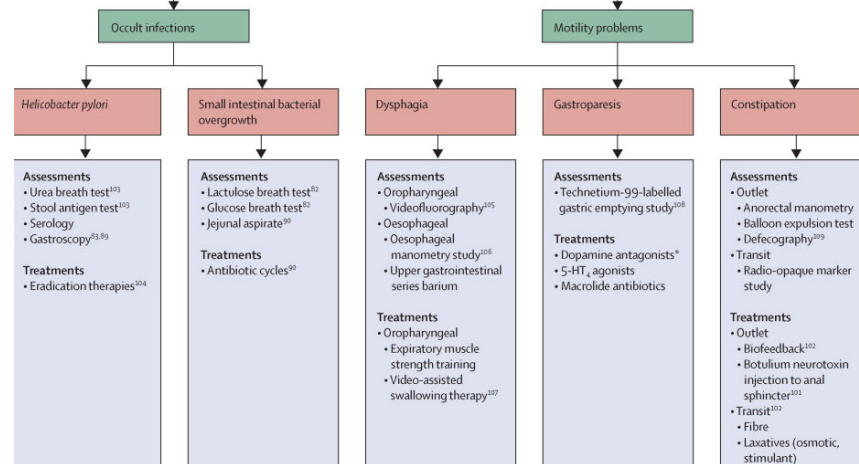
Slow-transit Constipation: Pathophysiology

- Decreased colonic motility and frequency of mass movements^{1,2}
- Blunted defecatory responses to waking, meals and laxatives^{2,3}
- Absent or decreased number of pacemaker cells (interstitial cells of Cajal) and enteric neurons⁴

1. Bassotti G, et al. *Am J Gastroenterol*. 1992;87:504-508.
2. Rao SS, et al. *Am J Gastroenterol*. 2004;99:2405-2416.
3. Bassotti G, et al. *Gut*. 1993;34:129-133.
4. He CL, et al. *Gastroenterology*. 2009;110:14-21.














Patients with Parkinson's disease with gastrointestinal symptoms or suboptimal response to dopaminergic drugs



NUTRITIONAL CONSIDERATIONS

Green leafy vegetables
 Other vegetables
 Nuts* (may recommend crushed or nut butters)
 Berries (especially blueberries and strawberries)
 Beans
 Whole grains
 Fish*
 Poultry
 Olive oil
 Red wine* — with caution — see below
 The five unhealthy groups are:
 Red meats
 Butter and stick margarine
 Cheese
 Pastries and sweets
 Fried or fast food

WHAT'S ON THE MIND DIET?

 AT LEAST THREE SERVINGS OF WHOLE GRAINS EACH DAY		
AT LEAST ONE DARK GREEN SALAD AND ONE OTHER VEGETABLE EACH DAY 	 BERRIES AT LEAST TWICE A WEEK	
 AT LEAST A ONE-OUNCE SERVING OF NUTS EACH DAY 		
 BEANS OR LEGUMES AT LEAST EVERY OTHER DAY	POULTRY AT LEAST TWICE A WEEK 	 FISH AT LEAST ONCE A WEEK
NO MORE THAN ONE TABLESPOON A DAY OF BUTTER OR MARGARINE; CHOOSE OLIVE OIL INSTEAD 	 CHEESE, FRIED FOOD AND FAST FOOD NO MORE THAN ONCE A WEEK	
PASTRIES AND SWEETS LESS THAN FIVE TIMES A WEEK 		

CONSTIPATION DIET CONSIDERATIONS

- 25 and 38 grams of dietary fiber per day are recommended for women and men, respectively.
- The average American adult consumes only 15 grams of fiber per day.
- Adequate fluid intake is essential with increased fiber intake.

THERAPUETIC CONSIDERATIONS

- **Change in diet or activity**
 - **Lowered activity** – Exercise and increased activity will assist in establishing regular bowel patterns.
 - **Diet** – Be sure to include fiber-rich foods: bran, whole-grain breads – oat, rye, fruits, vegetables (leave peel on), whole-grain cereals, oatmeal, pasta, nuts, popcorn and brown rice.
- **Medications** – narcotics, sedatives, antacids, antispasmodics, iron supplements
- **Not drinking enough fluids** – Drink at least 6 to 8, 8 ounce glasses of fluids per day. This is all inclusive (everything you drink like water, tea, coffee, juice, colas, etc.), but water is best, and we encourage you to drink primarily water. Bladder patients should reduce fluid intake after the evening meal.

PHARMACOLOGICAL CONSIDERATIONS

- Medications
- **Bulk producing:** Metamucil, Fibercom or Citrucel. Mix 1-2 Tablespoons in juice or water and take by mouth 1 to 2 times daily. This adds consistency or bulk to the stool and facilitates water retention in stool – must take adequate fluids by mouth to avoid causing constipation.
 - **Note:** some practitioners do not recommend these but other practitioners find it useful. See the quote below.
- **Stool Softeners:** Colace. Softens stool by facilitating the admixture of fat and water (detergent activity). Do not use with mineral oil. Take 1 tablet by mouth 1 to 2 times daily.
- **Combinations:** Pericolace. Mild stool softener and laxative combined. Take by mouth 1 to 2 times daily.
- **Irritant/Stimulant:** Products containing Senna. Laxative with direct action on the intestinal mucosa and the nervous plexus of the bowel.
- **Suppositories:** Glycerin, Dulcolax. Inserted rectally every other day or when needed. Stimulates the rectum and assists with evacuation.

NUTRITIONAL CONSIDERATIONS

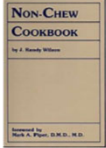
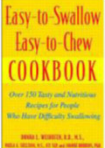
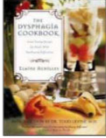

HEALTHY
EATING
GOALS

- Adequacy (Calories)
 - Avoiding unplanned weight loss
- Balance (Macronutrients)
 - Carbohydrate, protein, fat
- Variety (Micronutrients)
 - Vitamins and minerals
- Nutrition Challenges
 - Managing constipation
 - loss of appetite
 - medication interactions
- Minor adjustments often effective
- Add 100-400 calories daily for gradual weight gain
- Small, frequent meals are easier to tolerate
- Add softer foods that require less cutting and chewing
- Low protein-high calorie supplements may be helpful if
- larger additions are needed to manage weight loss

BONE HEALTH

- Enriched rice milk and almond milk are lower in protein and healthy alternatives to dairy for calcium and Vitamin D.
- The following are good sources of Vitamin D:
 - Skim, 1% or soy milk
 - Yogurt
 - Fatty fish such as salmon
 - Egg yolks
- Plant foods are rich in other nutrients important for bone health including magnesium and Vitamin K

HELPFUL DYSPHAGIA DIET RESOURCES

	The Non-chew Cookbook by J. Randy Wilson		The Easy-to-Swallow, Easy-to-Chew Cookbook by Joanne Robbins
	The Dysphagia Cookbook: Great Tasting and Nutritious Recipes for People with Swallowing Difficulties by Elayne Achilles		The Pureed Gourmet by Jane Evans

apda AMERICAN PARKINSON DISEASE ASSOCIATION
Strength in numbers. Hope in progress.

