Autonomic Nervous System Dysfunction in Parkinson's

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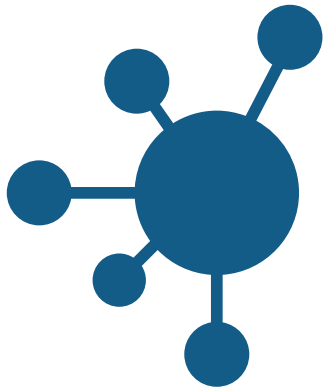

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Parkinson’s disease

- PD affects 1 million Americans, and we expect this number to increase over the next 30 years.

- It is mostly a disease of people over the age of 55, but can affect some that are much younger.

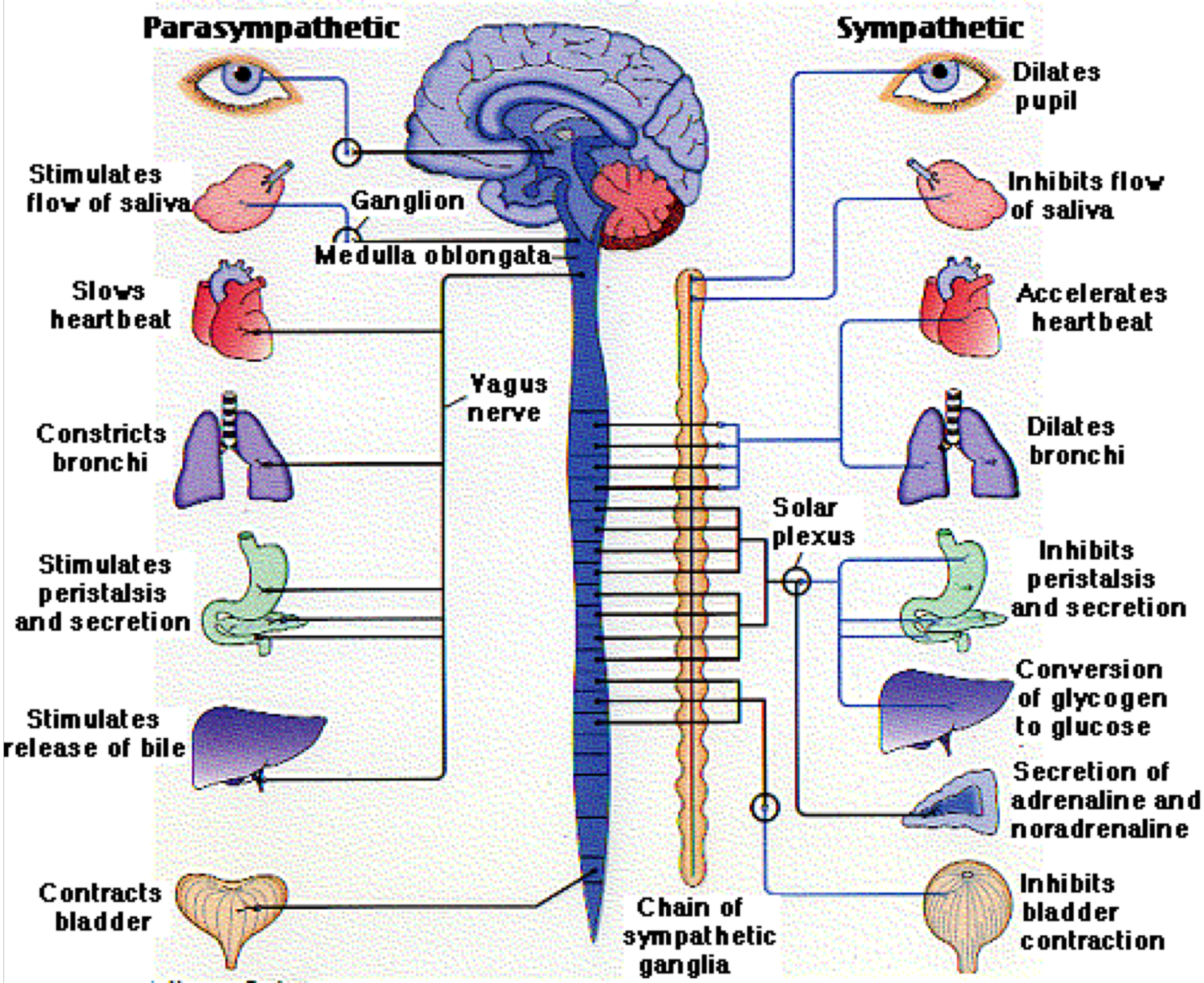
Parkinson’s disease

- Most people recognize the disease by its motor symptoms, including tremor, slowness and stiffness.

- However, there is a group of symptoms that are not typically seen, but felt by the patient, as the condition advances, that might become even more bothersome.

Autonomic Nervous System

- the part of the nervous system responsible for control of the bodily functions not consciously directed, such as breathing, the heartbeat, and digestive processes.


Parasympathetic
Sympathetic
Stimulates flow of saliva
Ganglion
Medulla oblongata
Slows heartbeat
Vagus nerve
Constricts bronchi
Stimulates peristalsis and secretion
Stimulates release of bile
Contracts bladder
Chain of sympathetic ganglia
Dilates pupil
Inhibits flow of saliva
Accelerates heartbeat
Dilates bronchi
Solar plexus
Inhibits peristalsis and secretion
Conversion of glycogen to glucose
Secretion of adrenaline and noradrenaline
Inhibits bladder contraction

Autonomic Nervous System

- Dysfunction of the Autonomic Nervous System can be variable, and include problems with:

- the heart
- Gut
- urinary and genital
- Sweating
- temperature control
- eyes (pupillary abnormalities)
- sleep and respiratory disorders.

Autonomic Nervous System

- They may represent a useful tool in the differential diagnosis of “atypical” or “complicated” parkinsonisms.

- Are they going to be happen to everyone: Not necessarily
- Do we need to know about them: Definitely

Most prevalent ANS symptoms:

- Constipation
  - One of the earliest symptoms.
  - Constipation occurs when bowel movements become less frequent and stools become difficult to pass.
  - Every person have different bowel habits
  - Some people pass stolls multiple times per day, others every other day
  - What is abnormal: a person should have a bowel movement at least every three days, after this, stools become harder and more difficult to pass.
  - Ideally, one per day.

How to address:

- Water and Movement are critical.

Constipation

- Constipation is an alteration in stool frequency, consistency, and/or passage of stool. The normal pattern of bowel movements can and will vary by 1 to 3 days. A stool-voiding pattern of every day or every other day is encouraged.

Causes

A.Change in diet or activity.

B.Medical Reasons: cancer, pregnancy, hemorrhoids, neurological disorder, muscular disorder, intestinal inflammation.

C.Medications: narcotics, sedatives, antacids, antispasmodics, iron supplements

- III. Treatment Management
-

A.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.

- B.Activity - Exercise and increased activity will assist in establishing regular bowel patterns.

- C.Diet - 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.
- Daily recommended fiber intake: 20 - 30 grams

Medicines Used to help:

1. 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.

2. 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.

3. Combinations: Pericolace. Mild stool softener and laxative combined. Take by mouth 1 to 2 times daily.

Medicines Used to Help

- 4. Irritant/Stimulant: Products containing Senna. Laxative with direct action on the intestinal mucosa and the nervous plexus of the bowel.

5. Suppositories: Glycerin, Dulcolax. Inserted rectally every other day or when needed. Stimulates the rectum and assists with evacuation.

6. Osmotic Laxative: Miralax. is a laxative used to treat constipation. It increases the amount of water in the stool. Bowel movements become easier and more frequent.

Drooling

- debilitating symptom which occurs when there is excess saliva in the mouth beyond the lip margin.
- drooling is problematic, leading to clinical and functional complications such as impairment in social functioning (embarrassment and isolation), aspiration, skin breakdown, bad odor, and infection.
- can be either due to increased production of saliva (idiopathic or drug-induced) or related to failure of mechanisms that clear and remove saliva from the oral cavity.

Drooling

- muscle incoordination inhibits the initiation of the swallow reflex, thereby further disrupting the path of saliva from the mouth to the oropharynx
- is usually due to impaired swallowing as a result of impaired neuromuscular function.

What is the challenge?

- Medications typically used to treat drooling can cause confusion, hallucinations and memory problems in patients with PD.
- Treatment can be expensive in some cases
- Not much will be accomplished without an interdisciplinary approach

Treatment of sialorrhea is best managed by a clinical team that includes primary health care providers, speech pathologists, occupational therapists, dentists, orthodontists, neurologists, and otolaryngologists.

TABLE 3
Medications for Treatment of Sialorrhea

AGENT	*HOW SUPPLIED*	*DOSAGE*	*SIDE EFFECTS*	*COST**
Glycopyrrolate	Scored tablets,† 1 or 2 mg	Adults: Start at 0.5 mg orally, one to three times daily; titrate to effectiveness and tolerability‡	Constipation, excessive oral dryness, urinary retention, blurred vision, hyperactivity, irritability	$ 0.66 per 1-mg tablet
		Children: 0.04 mg per kg per dose orally, two to three times daily; titrate to effectiveness and tolerability		
Scopolamine (Transderm Scop)	Patch, 1.5 mg	Apply patch every day	Pruritus at patch site, urinary retention, irritability, blurred vision, dizziness, glaucoma	20.99 per four 1.5-mg patches
Botulinum toxin A	Vial, 100 U per vial	Under ultrasound guidance, injections of 10 to 40 units into each submandibular and parotid gland	Pain at injection site, excessive oral dryness	521.25 per vial

*—*Estimated cost to the pharmacist based on average wholesale prices in Red Book. Montvale, N.J.: Medical Economics Data, 2001. Cost to the patient will be higher, depending on prescription filling fee*.

†—*Tablets may be crushed, if patient prefers*.

‡—*The maximum daily dose for adults is 8 mg*.

Information from references 14 through 18.

If medicines and conservative approaches fail:

- Surgical intervention, including salivary gland excision, salivary duct ligation, and duct rerouting, provides the most effective and permanent treatment of significant sialorrhea and can greatly improve the quality of life of patients and their families or caregivers.

Orthostatic Hypotension

- Orthostatic hypotension or Neurogenic orthostatic hypotension (NOH) is one complication of Parkinson's disease that is frequently overlooked.
- The reason is that symptoms can be quite variable, and usually requires extensive time obtaining the history to understand what is happening to the patient.

- Approximately 40% PD patients (even more those suffering from multiple systems atrophy, MSA) suffer from orthostatic hypotension which can be related to an autonomic dysfunction of blood pressure and/or side effect from Parkinson medications such as Carbidopa/Levodopa, Dopamine Agonist or Amantadine.

Neurogenic Orthostatic Hypotension

- NOH refers to a drop in systolic drop pressure of 20 mm Hg or diastolic blood pressure of 10 mm Hg when the patient changes from the sitting to the standing position.

- The drop in blood pressure is usually manifested as a sensation of dizziness, unsteadiness with ambulation, the feeling that the patient is going to pass out or indeed, they might pass out and lose consciousness.

Neurogenic Orthostatic Hypotension

- The symptoms typically occur when the patient is changing from a position where they are lying down or sitting down and they stand up.

- They usually occur within 1-5 minutes after the change in position and requires for the patient to make a stop or probably sit down.

How to Treat NOH?

- Fluid Intake
- Check your blood pressure meds
- Fluid Intake
- Add more sodium to diet if not contraindicated
- Fluid Intake
- Compressive Socks
- Fluid Intake
- Careful when standing up

How to treat NOH?

- If all conservative measures fail, meds used can be:

- Midodrine
- Fludrocortisone
- Droxidopa

Once improved?

- No need to measure BP every hour.

Urinary Frequency

- Urinary frequency is the need to urinate many times during the day, at night (nocturia), or both but in normal or less-than-normal volumes. Frequency may be accompanied by a sensation of an urgent need to void (urinary urgency).

Common Symptoms:

- In decreasing order of symptom prevalence (Fahn, Jancovic, 2007):
  - Nocturia
  - Frequency
  - Urgency
  - Urge incontinence
  - Hesitancy and bladder retention

Urinary Frequency

- Nocturia is the most common complaint in >60% patients with PD.
- Urgency occurs in 33-54% of patients
- Frequency is experienced by 16-36% of patients.
- Detrusor overactivity (DO) is the most common bladder tone abnormality in patients with PD.
- Patients presenting with bladder problems not improving with medications and PD should undergo full urodynamic investigation including cystometry, flowmetry and ultrasonography before treatment is initiated.

What is the challenge here?

- Medications that are used to treat bladder problems in PD may be associated with the following side effects in PD:
  - Confusion
  - Hallucinations
  - Worsening of orthostatic hypotension
  - Drowsiness
  - Abnormal Heart Rythms

Bladder Dysfunction in PD

- Associated with lower quality of life
- Negative impact on caregivers (Gotoh et al. 2009).
- Tendency to alter daily routine: work less hours during the day. Avoid going far from home.
- Greater affect on emotional and social wellbeing on men than in women (Tennstedt et al. 2010).
- Men are half as likely as women to get help.

Urge Incontinence

- Takes time to identify the problem
- Most common type seen in males
- Most common type in Parkinson’s disease.
- Impaired, premature signals from the bladder to the brain
- Inability of the brain or spinal cord to control bladder contractions.
- Very common in various neurological conditions such as spinal cord injury, multiple sclerosis, Parkinson’s disease.

Medications to treat, but be careful

- Alpha blockers – Tamsulosin (Flomax), doxazosin (Cardura), terazosin (Hytrin), alfuzosin (Uroxatral).
- Used to treat urge and overflow incontinence in men with enlarged prostates. Side effects include orthostatic hypotension and dizziness.

- Anticholinergic drugs – Oxybutynin (Ditropan), tolterodine (Detrol), darifenacin (Enablex), solifenacin (Vesicare), fesoterodine (Toviaz), and trospium (Sanctura).
- Most common medications used to treat urge incontinence and overactive bladder in both men and women.

Medication used to treat

- Mirabegron (Myrbtetriq) is now being used in patients with urge incontinence who can’t tolerate anticholinergic medicine.
- Associated with less dry mouth and constipation. Can cause high blood pressure.

- Botox injections – weaken the bladder muscle. Helpful for urgency/urge incontinence which could be helpful in Parkinson’s.

Erectile Dysfunction

- Sexuality is a basic human right and essential part of healthy life.
- For patients with chronic disease, sexuality is also a significant determinant of their quality of life .
- Most men with PD consider erectile dysfunction (ED) to be the most distressing of their various disabilities imposed by the disease.

Erectile Dysfunction

- SD is common in patients with PD, associated with depression and relationship dissatisfaction.
- ED was reported by 54–79% of men with PD.
- Many medications, such as antihypertensive and antidepressant agents, have adverse effects on sexuality.

What needs to be checked?

- Testosterone deficiency is a well-documented cause of depression, fatigue, decreased libido, erectile dysfunction and decreased work performance.

- Replacement can provide improvement of the symptom.

Treatment

- ED is the only SD with evidence-based drug treatment available.
- Its efficacy in PD patients with ED and depression was reported to be 85% .
- These medications therefore do not cause erection, but enhance the response to sexual arousal.
- They are contraindicated in men with hypotension (blood pressure below 90/50 mmHg).

Treatment

- Some PD patients find the ‘guaranteed’ erection induced by the intrapenile injection appealing, as it is not dependent on arousal.

- In patients unwilling to take medicines, a vacuum device may help, but requires dexterity from the patient or his partner.

- It is rarely adopted by elderly couples. In patients with neurogenic ED, rigidity adequate for penetration has been reported by 90% of respondents.

Conclusion

- This kind of problems might become more disruptive that the tremors and stiffness typically associated with PD.
- History is critical to identify the problem, and implement a plan of action.
- Multiple trials and errors might be required to identify what intervention is most beneficial to patients.
- Interdisciplinary approach might be needed.

This presentation will be available for download this Friday at:

www.NeurologyOne.net

Troubleshooting Parkinson's Disease delivers a rare combination – expertise and accessibility. Readers can absorb the latest research-driven medical insights, written for people with no medical background. The book is essential for spouses, siblings, children and friends supporting those diagnosed with the disease. From its beginning. Troubleshooting Parkinson's opens doors by spelling out the language in which caregivers will communicate with physicians. Author Ramon L. Rodriguez, a physician renown for his Parkinson's clinical work, empowers readers by laying out the terms that **will soon come to define the lives of loved ones. It dispels the mysteries of carbidopa,** levodopa and other drugs that can provide a quality of life to those who would not otherwise enjoy one. Dr. Rodriguez touches on critical every-day tasks, noting the importance of things as seemingly benign as the wear pattern on shoes. These pages come to life with stories of actual patients and their caregivers navigating a world they could not have foreseen. Throughout, Dr. Rodriguez serves as an expert guide.

"This book on troubleshooting Parkinson's disease is essential reading for patients and for caregivers. The book offers common sense solutions to the challenges that frequently crop up during the course of Parkinson's disease. The language is easy to understand and the stories are heartwarming and practical."

Michael S. Okun, M.D.
Adelaide Lackner Professor and Chair of Neurology,
Medical Director Parkinson's Foundation

As someone who works with patients with Parkinson's and their caregivers as well as caring for someone with Parkinson's, I have witnessed how many people are confounded by this disease and how it impacts their lives. Troubleshooting Parkinson's Disease puts the voice of an expert right in the hands of those who need it most.

Anissa Mitchell, LCSW,
AdventHealth, Parkinson's Outreach Center

Dr. Ramon L. Rodriguez first became intrigued with movement-disorder studies while undergoing his residency training at the University of Texas Medical School. Earlier he had received his medical degree from the University of Puerto in San Juan, graduating magna cum laude. But it was during his residency training in Neurology, studying under Dr. John Calverley, that compelled him to look further into these complex disorders.

As clinical director of UF's Center for Movement Disorders and Neurorestoration and also of its Clinical Research Center for Neurological Disorders, he supervised more than fifty clinical research studies. His research delved into Parkinson's disease, Huntington's disease, Dystonia, Alzheimer's Disease, Deep Brain Stimulation, Advanced therapies for Parkinson's disease, and Telemedicine for movement disorders.

Now his attention turns squarely on patients. In addition to treating Parkinson's Disease, he treats patient with Parkinson's plus syndromes and other neurodegenerative disorders. The results have been profound. After evaluating thousands of patients with Parkinson's disease and other movement disorders, and being involved in cutting edge research, the author is sharing his experience about common problems observed in the more advanced stages of the disease.

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TROUBLESHOOTING PARKINSONDS: A GUIDE FOR CAREGIVERS

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TROUBLESHOOTING PARKINSONS

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