PACIFIC MOVEMENT DISORDERS CENTER

AT PACIFIC NEUROSCIENCE INSTITUTE®

PARKINSON'S DISEASE: NON-MOTOR SYMPTOM MANAGEMENT

Non-motor symptoms can have a large impact on quality of life and level of functioning in patients with PD. In some patients, their non-motor symptoms are more problematic than their motor symptoms. Please note that in the table below, many of the medications may have been studied in clinical trials and can be recommended based on efficacy in these trials (and therefore would be considered *evidence-based*) but are not FDA-approved for use in Parkinson's disease. FDA approval requires studies to show benefit as well as an extensive and costly application process, typically by the pharmaceutical company. The use of medications for conditions beyond what has been FDA approved for is called *off label* and this is noted below.

May be related to mu	ometimes improved when motor symptoms are improved scle fatigue, sleep deprivation, depression, or even the meds of PD itself ithy (the lack of will to do things)	
Potential testing	 Blood test for thyroid, anemia and testosterone levels Consideration of poor quality / quantity of sleep Evaluation for underlying depression 	
Non-medication treatment	 Get regular sleep Exercise Eat a balanced diet Manage timing of activities Increase socialization 	
Medication options	 Rasagiline 1 mg (Azilect) Off label options: Modafinil (Provigil) for excessive daytime somnolence Methylphenidate (Ritalin) 	
Potential side effects	 Methylphenidate may be habit-forming. Both medications could cause agitation, exacerbation of hallucinations, delusions, insomnia, headache Azilect can cause dizziness, nausea, headache, indigestion, agitation, back pain, dyspepsia; may aggravate dyskinesias 	

	e activity of the autonomic nervous system which controls the visceral organs lowing of the gut's wave-like movements, known as slow transit constipation	
Things to know	 Bulking agents such as fiber are less effective because the gut does not respond well from a neurological perspective It's important to treat constipation aggressively to prevent hemorrhoids, diverticulosis, anal fissures, rectal prolapse, fecal impaction 	
Potential testing	 Often none is required Consultation with a gastroenterologist Sigmoidoscopy or colonoscopy to exclude a structural blockage Colon transit studies 	
Non-medication treatment	 Increase fiber in the diet Increase physical activity Reduce medications that can cause constipation 	
Medication options	 Over the counter: Senna (SennaKot), a natural stimulant laxative Miralax (polyethylene gycol) 1 capful daily Colace (stool softener) Dulcolax (laxative) Magnesium citrate Lactulose 	
Potential side effects	Diarrhea, abdominal pain, bloating	

ORTHOSTATIC HYPOTEN	ISION (OH)
• Lightheadedness upor	n standing due to drops in blood pressure (BP) e activity of the autonomic nervous system which controls the visceral organs
Things to know	 Patients with OH may also have supine hypertension, meaning their blood pressure is very high lying down. Treating OH may exacerbate supine hypertension and vice versa Patients may need to sleep with the head of bed at 30 degrees, as well as using a short-acting BP med at night plus an OH med during the day
Potential testing	 Check BP and pulse lying down, sitting, then standing in clinic Keep a BP log, checked in lying down, sitting and standing positions on a daily basis
Non-medication treatment	 Keep out of bed during the day Wear compression stockings (knee high or thigh high) Wear an abdominal binder Stay hydrated, increase salt in the diet Increase exercise Isometric exercises in the legs and arms prior to standing up
Medication options	 Prescription: Droxidopa (Northera) 100 mg 3 times daily Midodrine up to 10 mg 3 times daily Off label: Fludricortisone (Florinef) up to 0.3 mg daily Pyridostigmine (Mestinon) 60 mg 3 times per day
Potential side effects	 Supine hypertension is often asymptomatic but can be very dangerous and can cause stroke, heart attack, retinal damage, kidney damage Other side effects of midodrine include tingling, itching, burning while urinating; of pyridostigmine include abdominal pain, urinary frequency, tearing, sweating Pyridostigmine can exacerbate tremor and rigidity
 URINARY SYMPTOMS Frequency (too often) Urgency (can't hold it Incontinence (accident Nocturia (waking up s Urinary retention (black) 	as long) ts) several times at night to urinate)
Things to know	• Due to changes in the activity of the autonomic nervous system which controls the visceral organs, known as autonomic dysfunction
Potential testing	 Consultation with a urologist For men, checking the prostate Urodynamics (checking neurological control of the bladder and sphincter)
Non-medication treatment	 Reduce fluid intake prior to bedtime Reduce medications that can cause urinary retention Avoid alcohol and caffeine Bladder retraining Improve mobility
Medication options	 Overactive Bladder: Tolterodine 2-4 mg / day Oxybutynin 5-15 mg / day Soifenacin 5-10 mg / day Onabotulinum toxin (Botox) injection Off label: Urinary retention: Bethanechol 25-75 mg / day Nocturia: Desmopressin spray
Potential side effects	 Anticholinergic medications for overactive bladder can cause confusion, dry mouth, constipation, urinary retention, blurry vision and redness Cholinergic agonist medications such as bethanechol can worsen PD symptoms and cause diarrhea, sweating, nausea, excess saliva

SEXUAL DYSFUNCTION

- Reduced libido
- Erectile dysfunction

• Increased libido / hypersexuality can occur with dopamine agonist use

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Things to know	• Due to changes in the activity of the autonomic nervous system which controls the visceral organs, known as autonomic dysfunction
Potential testing	 Consultation with a urologist Testosterone levels Evaluation for diabetes
Non-medication treatment	Pump devices
Medication options	Sildenafil (Viagra) 50-100 mg prior to sexual activity
Potential side effects	Headache, flushing, dyspepsia, temporary visual symptoms

THERMOREGULATORY DYSFUNCTION

SweatingFlushing	Cold intoleranceOften associated with peak-dose dyskinesias
Things to know	• Due to changes in the activity of the autonomic nervous system which controls the visceral organs, known as autonomic dysfunction
Potential testing	Blood tests for hormonal or metabolic dysfunction
Non-medication treatment	Air conditioningHeating systems
Medication options	Trihexiphenydil 2 mg 3 times per day
Potential side effects	Dry mouth, constipation, urinary retention, confusion, blurry vision, redness

DROOLING (SIALORRHEA)

Due to reduced swallow frequency

Potential testing	Typically none
Non-medication treatment	Use of chewing gum or hard candy to encourage swallowing
Medication options	 Off label: Glycopyrrolate 1 mg 3 times per day Onabotulinum toxin (Botox) injection to the submandibular and parotid glands
Potential side effects	 For glycopyrrolate, dry mouth, confusion, headache, diarrhea, fatigue For onabotulinum toxin (Botox) injection, dry mouth and difficulty swallowing

DIFFICULTY SWALLOWING (DYSPHAGIA)

- Coughing after swallowing
- "Silent" aspiration
- Delayed gastric emptying causing early satiety, known as gastroparesis

Potential testing	 Swallow study Evaluation by a speech therapist Consultation with a gastroenterologist Gastric emptying study
Non-medication treatment	 Chin tuck Sit up straight Chew thoroughly and swallow slowly Small bites and sips Chin tuck Clear the throat with a double swallow and a cough Thickening product for thin liquids Puree foods
Medication options	• For delayed gastric emptying, erythromycin 50-250 mg 3-4 times per day or domperidone 10-20 mg 2-4 times per day
Potential side effects	Nausea, vomiting, abdominal pain; breast leakage from domperidone due to excess prolactin levels

SLEEP SYMPTOMS

- Insomnia (trouble falling or staying asleep)
- Trouble rolling over in bed
- Restless legs syndrome

Restless legs syndrome		
Things to know	 Tremor, rigidity and dystonia could interfere with sleep and therefore a nighttime controlled release levodopa or dopamine agonist may help for sleep Depression and anxiety may contribute to insomnia and should be addressed 	
Potential testing	 Sleep study is often indicated to assess for sleep apnea, which can exacerbate sleep issues Iron studies for restless legs syndrome 	
Non-medication treatment	Avoid caffeine and alcohol Avoid screen use 2 hours prior to bedtime Keep the bedroom dark at nighttime Positive airway pressure for sleep apnea	
Medication options	 Melatonin Tryptophan Diphenhydramine Trazodone Gabapentin or gabapentin enacarbil for restless legs syndrome 	
Potential side effects	 Benzodiaezpines such as temazepam or clonazepam may be habit-forming and have been associated with a risk of dementia and should be avoided The "z-drugs" (e.g., Ambien) can cause parasomnias (sleepwalking and sleeptalking) All sleep-inducing medications can cause daytime somnolence or grogginess 	

REM SLEEP BEHAVIOR DISORDER (RBD)

• Dream sleep is known as rapid eye movement (REM) sleep because when we dream, the body is typically motionless other than eye movements

• In RBD, the body moves during REM sleep, resulting in dream enactment behavior

In RBB, the body move	a made, the body moves during tell sleep, resulting in dealth chaethert behavior	
Things to know	 The dreams in RBD tend to be vivid and/or violent The patient often is protecting himself or a loved one against an aggressor The patient may thus kick, punch or otherwise injure their bedfellow Patients may jump out of bed and injure themselves 	
Potential testing	 Sleep study to differentiate between RBD and other parasomnias such as sleepwalking and sleeptalking Sleep study excludes sleep apnea as a cause or worsening of RBD 	
Non-medication treatment	 Reduce medications that can cause or exacerbate RBD Safety measures: avoid sharp objects by the bed Keep the bed low Padding around furniture near the bed Keep the door closed 	
Medication options	Off label: • Melatonin 3-12 mg • Clonazepam 0.5-2 mg at bedtime	
Potential side effects	Daytime somnolence or grogginessNighttime confusion if they awaken to use the restroom	

DEPRESSION

- Not correlated with severity of motor symptoms
- Increased risk of suicidal thoughts • Things to know Tricyclic antidepressants (TCAs) can help for motor symptoms, drooling and sleep • **Potential testing** • Sometimes bloodwork may help if fatigue is the main manifestation Non-medication Psychosocial support • Counseling • Cognitive behavioral therapy Physical activity treatment • ٠ **Medication options** Dopamine/NE reuptake inhibitor: TCAs: • ٠ Nortriptyline 75 mg / night Buproprion (Wellbutrin) up to 300 mg / day • SNRIs: Venlafaxine (Effexor) up to 225 mg / day TCAs can worsen confusion, orthostatic hypotension Potential side effects SSRIs can worsen PD symptoms • . Antidepressant side effects include sexual dysfunction, headache, fogginess, insomnia

ANXIETY

- Not correlated with disease severity
- Can manifest as health anxiety, generalized worry, panic attacks, anxiety about meds wearing off Anxiety can worsen PD symptoms •

Anxiety can worsen PD symptoms		
Potential testing	Typically none	
Non-medication treatment	 Counseling Cognitive behavioral therapy Psychosocial support Physical activity 	 Reduce medications that may worsen anxiety Relaxation techniques Meditation Mindful awareness
Medication options	 Buspirone SSRIs: Paroxetine (Paxil) Citalopram (Celexa) Mirtazapine (Remeron) 	SNRIs: Venlafaxine (Effexor) Off label: Gabapentin
Potential side effects	 Dizziness, drowsiness, tingling, nause Sexual dysfunction, increased sleep, i Imbalance, blurry vision 	a ncreased appetite / weight gain (mirtazapine)

 COGNITIVE DYSFUNCTI Can range in severity Changes in personali Delayed mental response Impaired working mental PD-related dementia 	ty onses emory
Things to know	 In PDD, dementia comes on no earlier than a year after diagnosis of parkinsonism In dementia with Lewy bodies (DLB), dementia comes on before or at the same time as parkinsonism Differs from Alzheimer's disease in that memories can still be encoded, just harder to retrieve
Potential testing	 Neuropsychological evaluation (a battery of tests assessing memory, language, visuospatial function, and executive function) Sleep study to exclude sleep apnea if there are risk factors such as snoring and obesity Blood and urine tests if cognitive changes occur rapidly to exclude infection
Non-medication treatment	 Mental stimulation Physical activity Social support Improved sleep Discontinue medications that can cause confusion
Medication options	Rivastigmine (Exelon)Off label:• Oral: up to 4.5 mg twice a day• Donepezil 10 mg at bedtime• Patch: up to 9.6 mg/ 24 hours• Memantine 10 mg twice a day
Potential side effects	 Rivastigmine/ donepezil: Dizziness, diarrhea, weight loss, agitation, tremor Application site redness from patch Memantine: Dizziness, low blood pressure, confusion, headache, constipation, diarrhea

LOSS OF SENSE OF SMELL OR TASTE (ANOSMIA)	
Things to know	Often precedes diagnosis of PD by many years
Potential testing	UPSIT (smell testing)CT of sinuses if there is history of injury or recurrent infection
Non-medication treatment	 Cook with stronger spices Quit smoking Ensure fire detectors and smoke alarms are properly working
Medication options	None indicated

PSYCHOSIS

- Illusions (misperception) •
- Hallucinations
- Typically visual, but can be auditory or tactile as well Delusions (fixed false belief) •

Paranoia		
Things to know	Patients may not want to admit to these symptoms due to stigma Can be very distressing to patient or caregiver	
Potential testing	Blood and urine tests if cognitive changes occur rapidly to exclude infection	
Non-medication treatment	Keep rooms well-lit during the day Good sleep habits Minimize clutter Yearly vision exam	
Medication options	Pimavanserin (Nuplazid) 34 mg daily, a novel serotonin inverse agonist which does not affect motor symptoms. Nuplazid may take up to 4 weeks to take effect	
Potential side effects	 Nausea Swelling Confusion 	

 PAIN Typically due to rigidity Muscle aches due to tremor / dystonia Injury from falls Nerve pain: tingling, burning, shooting pain 			
Things to know	 Can cause patients to limit physical activity Limited mobility can in turn exacerbate joint and muscle pain 		
Potential testing	 Consultation with an orthopedic surgeon or sports medicine doctor X-ray of affected joint Blood and nerve test for neuropathy 		
Non-medication treatment	Physical therapyMassage therapy	 Rest / ice / compression / elevation Heat 	
Medication options	 Over the counter: Acetaminophen (Tylenol) NSAIDs such as ibuprofen (Advil, Motrin) 	Prescription / off label for nerve pain: Gabapentin Pregabalin Nortriptyline	
Potential side effects	 NSAIDs: Gastric ulcers, kidney injury, bleeding, high blood pressure Tylenol: Liver failure when taken at doses > 3 grams / day Gabapentin/pregabalin: Sedation, dizziness, blurry vision Nortriptyline: Dry mouth, constipation, sedation, urinary retention 		