

PACIFIC MOVEMENT DISORDERS CENTER

AT PACIFIC NEUROSCIENCE INSTITUTESM

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.

FATIGUE	
<ul style="list-style-type: none"> • Very common in PD, sometimes improved when motor symptoms are improved • May be related to muscle fatigue, sleep deprivation, depression, or even the meds of PD itself • Could manifest as apathy (the lack of will to do things) 	
Potential testing	<ul style="list-style-type: none"> • Blood test for thyroid, anemia and testosterone levels • Consideration of poor quality / quantity of sleep • Evaluation for underlying depression
Non-medication treatment	<ul style="list-style-type: none"> • Get regular sleep • Exercise • Eat a balanced diet • Manage timing of activities • Increase socialization
Medication options	<ul style="list-style-type: none"> • Rasagiline 1 mg (Azilect) Off label options: <ul style="list-style-type: none"> • Modafinil (Provigil) for excessive daytime somnolence • Methylphenidate (Ritalin)
Potential side effects	<ul style="list-style-type: none"> • 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

CONSTIPATION	
<ul style="list-style-type: none"> • Due to changes in the activity of the autonomic nervous system which controls the visceral organs • Constipation due to slowing of the gut's wave-like movements, known as slow transit constipation 	
Things to know	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Often none is required • Consultation with a gastroenterologist • Sigmoidoscopy or colonoscopy to exclude a structural blockage • Colon transit studies
Non-medication treatment	<ul style="list-style-type: none"> • Increase fiber in the diet • Increase physical activity • Reduce medications that can cause constipation
Medication options	Over the counter: <ul style="list-style-type: none"> • Senna (SennaKot), a natural stimulant laxative • Miralax (polyethylene glycol) 1 capful daily • Colace (stool softener) • Dulcolax (laxative) • Magnesium citrate • Lactulose Prescription / off label: <ul style="list-style-type: none"> • Linzess reduces transit time and decreases visceral pain
Potential side effects	<ul style="list-style-type: none"> • Diarrhea, abdominal pain, bloating

ORTHOSTATIC HYPOTENSION (OH)					
<ul style="list-style-type: none"> • Lightheadedness upon standing due to drops in blood pressure (BP) • Due to changes in the activity of the autonomic nervous system which controls the visceral organs 					
Things to know	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<table border="0"> <tr> <td>Prescription:</td> <td>Off label:</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Droxidopa (Northera) 100 mg 3 times daily up to 600 mg 3 times daily • Midodrine up to 10 mg 3 times daily </td> <td> <ul style="list-style-type: none"> • Fludricortisone (Florinef) up to 0.3 mg daily • Pyridostigmine (Mestinon) 60 mg 3 times per day </td> </tr> </table>	Prescription:	Off label:	<ul style="list-style-type: none"> • Droxidopa (Northera) 100 mg 3 times daily up to 600 mg 3 times daily • Midodrine up to 10 mg 3 times daily 	<ul style="list-style-type: none"> • Fludricortisone (Florinef) up to 0.3 mg daily • Pyridostigmine (Mestinon) 60 mg 3 times per day
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Potential side effects	<ul style="list-style-type: none"> • 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					
<ul style="list-style-type: none"> • Frequency (too often) • Urgency (can't hold it as long) • Incontinence (accidents) • Nocturia (waking up several times at night to urinate) • Urinary retention (bladder cannot empty) 					
Things to know	<ul style="list-style-type: none"> • Due to changes in the activity of the autonomic nervous system which controls the visceral organs, known as autonomic dysfunction 				
Potential testing	<ul style="list-style-type: none"> • Consultation with a urologist • For men, checking the prostate • Urodynamics (checking neurological control of the bladder and sphincter) 				
Non-medication treatment	<ul style="list-style-type: none"> • Reduce fluid intake prior to bedtime • Reduce medications that can cause urinary retention • Avoid alcohol and caffeine • Bladder retraining • Improve mobility 				
Medication options	<table border="0"> <tr> <td>Overactive Bladder:</td> <td>Off label:</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Tolterodine 2-4 mg / day • Oxybutynin 5-15 mg / day • Soifenacin 5-10 mg / day • Onabotulinum toxin (Botox) injection </td> <td> <ul style="list-style-type: none"> • Urinary retention: Bethanechol 25-75 mg / day • Nocturia: Desmopressin spray </td> </tr> </table>	Overactive Bladder:	Off label:	<ul style="list-style-type: none"> • Tolterodine 2-4 mg / day • Oxybutynin 5-15 mg / day • Soifenacin 5-10 mg / day • Onabotulinum toxin (Botox) injection 	<ul style="list-style-type: none"> • Urinary retention: Bethanechol 25-75 mg / day • Nocturia: Desmopressin spray
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Potential side effects	<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Reduced libido • Erectile dysfunction • Increased libido / hypersexuality can occur with dopamine agonist use 	
Things to know	<ul style="list-style-type: none"> • Due to changes in the activity of the autonomic nervous system which controls the visceral organs, known as autonomic dysfunction
Potential testing	<ul style="list-style-type: none"> • Consultation with a urologist • Testosterone levels • Evaluation for diabetes
Non-medication treatment	<ul style="list-style-type: none"> • Pump devices
Medication options	<ul style="list-style-type: none"> • Sildenafil (Viagra) 50-100 mg prior to sexual activity
Potential side effects	<ul style="list-style-type: none"> • Headache, flushing, dyspepsia, temporary visual symptoms

THERMOREGULATORY DYSFUNCTION	
<ul style="list-style-type: none"> • Sweating • Flushing • Cold intolerance • Often associated with peak-dose dyskinesias 	
Things to know	<ul style="list-style-type: none"> • Due to changes in the activity of the autonomic nervous system which controls the visceral organs, known as autonomic dysfunction
Potential testing	<ul style="list-style-type: none"> • Blood tests for hormonal or metabolic dysfunction
Non-medication treatment	<ul style="list-style-type: none"> • Air conditioning • Heating systems
Medication options	<ul style="list-style-type: none"> • Trihexiphenydil 2 mg 3 times per day
Potential side effects	<ul style="list-style-type: none"> • Dry mouth, constipation, urinary retention, confusion, blurry vision, redness

DROOLING (SIALORRHEA)	
Due to reduced swallow frequency	
Potential testing	<ul style="list-style-type: none"> • Typically none
Non-medication treatment	<ul style="list-style-type: none"> • Use of chewing gum or hard candy to encourage swallowing
Medication options	Off label: <ul style="list-style-type: none"> • Glycopyrrolate 1 mg 3 times per day • Onabotulinum toxin (Botox) injection to the submandibular and parotid glands
Potential side effects	<ul style="list-style-type: none"> • For glycopyrrolate, dry mouth, confusion, headache, diarrhea, fatigue • For onabotulinum toxin (Botox) injection, dry mouth and difficulty swallowing

DIFFICULTY SWALLOWING (DYSPHAGIA)	
<ul style="list-style-type: none"> • Coughing after swallowing • "Silent" aspiration • Delayed gastric emptying causing early satiety, known as gastroparesis 	
Potential testing	<ul style="list-style-type: none"> • Swallow study • Evaluation by a speech therapist • Consultation with a gastroenterologist • Gastric emptying study
Non-medication treatment	<ul style="list-style-type: none"> • Chin tuck • Sit up straight • Chew thoroughly and swallow slowly • Small bites and sips • Clear the throat with a double swallow and a cough • Thickening product for thin liquids • Puree foods
Medication options	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Nausea, vomiting, abdominal pain; breast leakage from domperidone due to excess prolactin levels

SLEEP SYMPTOMS	
<ul style="list-style-type: none"> • Insomnia (trouble falling or staying asleep) • Trouble rolling over in bed • Restless legs syndrome 	
Things to know	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Sleep study is often indicated to assess for sleep apnea, which can exacerbate sleep issues • Iron studies for restless legs syndrome
Non-medication treatment	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Melatonin • Tryptophan • Diphenhydramine • Trazodone • Gabapentin or gabapentin enacarbil for restless legs syndrome
Potential side effects	<ul style="list-style-type: none"> • Benzodiazepines 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)	
<ul style="list-style-type: none"> • 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 	
Things to know	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Melatonin 3-12 mg • Clonazepam 0.5-2 mg at bedtime
Potential side effects	<ul style="list-style-type: none"> • Daytime somnolence or grogginess • Nighttime confusion if they awaken to use the restroom

DEPRESSION	
<ul style="list-style-type: none"> • Not correlated with severity of motor symptoms • Increased risk of suicidal thoughts 	
Things to know	<ul style="list-style-type: none"> • Tricyclic antidepressants (TCAs) can help for motor symptoms, drooling and sleep
Potential testing	<ul style="list-style-type: none"> • Sometimes bloodwork may help if fatigue is the main manifestation
Non-medication treatment	<ul style="list-style-type: none"> • Counseling • Cognitive behavioral therapy • Psychosocial support • Physical activity
Medication options	<ul style="list-style-type: none"> • TCAs: Nortriptyline 75 mg / night • SNRIs: Venlafaxine (Effexor) up to 225 mg / day • Dopamine/NE reuptake inhibitor: Bupropion (Wellbutrin) up to 300 mg / day
Potential side effects	<ul style="list-style-type: none"> • TCAs can worsen confusion, orthostatic hypotension • SSRIs can worsen PD symptoms • Antidepressant side effects include sexual dysfunction, headache, foginess, insomnia

ANXIETY	
<ul style="list-style-type: none"> • Not correlated with disease severity • Can manifest as health anxiety, generalized worry, panic attacks, anxiety about meds wearing off • Anxiety can worsen PD symptoms 	
Potential testing	<ul style="list-style-type: none"> • Typically none
Non-medication treatment	<ul style="list-style-type: none"> • Counseling • Cognitive behavioral therapy • Psychosocial support • Physical activity • Reduce medications that may worsen anxiety • Relaxation techniques • Meditation • Mindful awareness
Medication options	<ul style="list-style-type: none"> • Buspirone • SSRIs: <ul style="list-style-type: none"> • Paroxetine (Paxil) • Citalopram (Celexa) • Mirtazapine (Remeron) <p>SNRIs: Venlafaxine (Effexor) Off label: Gabapentin</p>
Potential side effects	<ul style="list-style-type: none"> • Dizziness, drowsiness, tingling, nausea • Sexual dysfunction, increased sleep, increased appetite / weight gain (mirtazapine) • Imbalance, blurry vision

COGNITIVE DYSFUNCTION	
<ul style="list-style-type: none"> • Can range in severity • Changes in personality • Delayed mental responses • Impaired working memory • PD-related dementia (PDD) 	
Things to know	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Mental stimulation • Physical activity • Social support • Improved sleep • Discontinue medications that can cause confusion
Medication options	<p>Rivastigmine (Exelon)</p> <ul style="list-style-type: none"> • Oral: up to 4.5 mg twice a day • Patch: up to 9.6 mg/ 24 hours <p>Off label:</p> <ul style="list-style-type: none"> • Donepezil 10 mg at bedtime • Memantine 10 mg twice a day
Potential side effects	<p>Rivastigmine/ donepezil:</p> <ul style="list-style-type: none"> • Dizziness, diarrhea, weight loss, agitation, tremor • Application site redness from patch <p>Memantine:</p> <ul style="list-style-type: none"> • Dizziness, low blood pressure, confusion, headache, constipation, diarrhea

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

PSYCHOSIS	
<ul style="list-style-type: none"> • Illusions (misperception) • Hallucinations • Typically visual, but can be auditory or tactile as well • Delusions (fixed false belief) • Paranoia 	
Things to know	<ul style="list-style-type: none"> • Patients may not want to admit to these symptoms due to stigma • Can be very distressing to patient or caregiver
Potential testing	<ul style="list-style-type: none"> • Blood and urine tests if cognitive changes occur rapidly to exclude infection
Non-medication treatment	<ul style="list-style-type: none"> • Keep rooms well-lit during the day • Good sleep habits • Minimize clutter • Yearly vision exam
Medication options	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Nausea • Swelling • Constipation • Confusion

PAIN					
<ul style="list-style-type: none"> • Typically due to rigidity • Muscle aches due to tremor / dystonia • Injury from falls • Nerve pain: tingling, burning, shooting pain 					
Things to know	<ul style="list-style-type: none"> • Can cause patients to limit physical activity • Limited mobility can in turn exacerbate joint and muscle pain 				
Potential testing	<ul style="list-style-type: none"> • Consultation with an orthopedic surgeon or sports medicine doctor • X-ray of affected joint • Blood and nerve test for neuropathy 				
Non-medication treatment	<ul style="list-style-type: none"> • Physical therapy • Massage therapy • Rest / ice / compression / elevation • Heat 				
Medication options	<table border="0"> <tr> <td>Over the counter:</td> <td>Prescription / off label for nerve pain:</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Acetaminophen (Tylenol) • NSAIDs such as ibuprofen (Advil, Motrin) </td> <td> <ul style="list-style-type: none"> • Gabapentin • Pregabalin • Nortriptyline </td> </tr> </table>	Over the counter:	Prescription / off label for nerve pain:	<ul style="list-style-type: none"> • Acetaminophen (Tylenol) • NSAIDs such as ibuprofen (Advil, Motrin) 	<ul style="list-style-type: none"> • Gabapentin • Pregabalin • Nortriptyline
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Potential side effects	<ul style="list-style-type: none"> • 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 				