

Parkinsonism Medications

Drug	Formulation	Initial dosage	Maximum dose	Indications/Precautions	Side effects
Dopamine					
LevoDopa/Carbidopa	Sinemet tab (10/100 – 25/100 – 25/250)	25/100 <u>half</u> tab TID	8 tabs 25/250 per day (200mg carbidopa)	- Take 30m before food - Sudden interruption will cause hyperpyrexia and delirium - Caution in patients with arrhythmia	Common Dopaminergic Side Effects Falling asleep during ADL – Impulse control disorders – Hallucination/confusion – Dyskinesia - Nausea – Dizziness - Constipation - Orthostatic hypotension – Anxiety - Confusion -Hallucination – Dyskinesia
	Parcopa ODT tab (10/100 – 25/100 – 25/250)	25/100 <u>half</u> tab TID			
	Sinemet CR tab (25/100 – 50/200)	25/100 BID			
	Rytari ER capsules (23.75/95 – 36.25/145 – 48.75/195 – 61.25/245)	23.75/95 TID			
MAO B inhibitors					
Selegellin	Eldepryl – Carbex tab (5mg)	5mg BID	5mg BID	Adjunct to levodopa (patients with long Off periods)	Dopaminergic Side Effects (as Sinemet)
	Zelapar ODT (1.25mg)	1.25 mg Daily	1.25mg Daily		
Rasagellin	Azilect tab (0.5 – 1 mg)	0.5mg Daily		Adjunct to levodopa or monotherapy	Dopaminergic Side Effects (as Sinemet)
Safinamide	Xadago tab (50 – 100 mg)	50mg daily	100mg daily	Adjunct to levodopa for patients with Off periods	Dopaminergic Side Effects (as Sinemet) Less dyskinesia
COMT inhibitors					
Entacapone	Comtan tab (200mg)	200mg with each dose of levodopa	8 Tab per day	Adjunct to levodopa (patients with long Off periods)	Dopaminergic Side Effects (as Sinemet) + Diarrhea – Abdominal pain – Orange colored urine
Dopamine agonists					
Apomorphine	Apokyn solution 30 mg/3 mL (10 mg/mL) with multi-use injector.	0.2 ml daily prn then TID prn off state	0.6 ml (6mg) PRN	Antiemetic trimethobenzamide (300 mg three times a day) should be started 3 days prior to the initial dose of Apokyn	Dopaminergic Side Effects (as Sinemet) + Hallucinations (14%) – Impulse control disorders - Dyskinesia (24%) – Angina/MI (4%) – QTc prolongation – Priapism
Bromocriptine	Parlodel tab (2.5mg – 5mg)	2.5mg TID			Dopaminergic Side Effects (as Sinemet)
Pramipexole	Mirapex tab (.125, .25, .5, 1, 1.5 mg)	0.125mg TID	4.5mg/day		Dopaminergic Side Effects (as Sinemet)
	Mirapex ER tab (.375, .75, 1.5, 3, 4.5 mg)	0.375mg daily			
Ropinirole	Requip tab (.25, .5,1,2,3,4,5 mg)	0.25mg TID	24mg/day	Binds to Melanin in animals, longer duration in patients with darker skin (up to 20 ays)	Dopaminergic Side Effects (as Sinemet) + Nausea – Dizziness – Leg edema
	Requip XL tab (2,4,6,8,10 ,12,14,16,18,20,24 mg)	2mg daily			
Rotigotine	Neupro patches (2,4,6,8 mg patches)	2mg patch daily	8mg/24h	Avoid in sulfite allergic patients	Dopaminergic Side Effects (as Sinemet) + application site reactions

Anticholinergics					
Benzotropine	Cogentin tab 0.5mg	0.5mg BID	6mg /day		Confusion – Hallucination – Dry mouth – Blurred vision – Urine retention
Other Medications					
Amantadine	Symmetrel tab 100mg	100mg BID	400mg/day	Caution in patients with seizures, RF or CHF	Suicide ideations – Lowers seizure threshold – Confusion – Hallucinations – Nausea – Dizziness – Insomnia – Dry mouth – Peripheral edema – Livedo reticula
Amantadine ER	Gocovri capsule 68.5, 137mg	137mg QHS x 1 week then 274mg QHS	274mg/day	Caution in patients with seizures, RF or CHF	Same as amantadine
Carbidopa/Levodopa/Entacapone	Stalevo tab (12.5/50/200 – 18.75/75/200 – 25/100/200 – 37.5/150/200 – 50/200/200)	as Sinemet	as Sinemet		

All dopaminergic medications

- Cause impulse control disorders (urge to gamble, have sex, and to spend money) , sudden falling asleep during ADL as driving or working on machinery, confusion and hallucination.
- Can lead to NMS with abrupt discontinuation.

MAOI cause:

- Serotonin syndrome if given with: opioids (eg, meperidine and its derivatives, methadone, tramadol); SNRIs; TCAs; cyclobenzaprine; methylphenidate, amphetamine; or St John's wort.
- Hypertensive crisis if given with: other MAOI, drugs with MAOI properties as Linezolid
- Psychosis if given with dextromethorphan

Entacapone:

- COMT and non-selective MAO inhibitors (Phenelzine "Nardil" – Tranycypromine "Parnate") can't be given together, they will prevent catecholamine metabolism.
- Be cautious when administering epinephrine, norepinephrine, dopamine, dobutamine or alpha-methyldopa in patients taking COMT inhibitor.
- Diarrhea present in 10% of patients on Entacapone due to lymphocytic activation causing microscopic colitis. Usually starts after 4 weeks of initiation of therapy.

Rotigotine (Neupro):

- Advantage: No interaction with meals, no adjustment for mild-moderate hepatic disease, no adjustment for renal impairment,
- Use: use different spot every day, avoid using in same spot more than once every 14 days. It should be pressed firmly in place for 30 seconds after application.

Augmentation, tolerance and rebound in patients with RLS:

- Tolerance: patient require increasing doses of medication to get the same improvement
- Rebound: by the end of the dose effect, patient will get marked worsening of his symptoms
- Augmentation: Patient develops worsening of symptoms with the medications. Observed only with dopaminergic therapy for RLS (dopamine agonists and Levodopa). Management is a dopaminergic holiday of at least 3 months.

Medications for Non-Motor Manifestations of Parkinsonism

Symptom	Drug of choice	Max dose	Side effects	Notes
Neurogenic orthostatic hypotension (NOS)	Droxidopa (Northera tab 100, 200, 300 mg)	600mg TID	Hypertension – Nausea – Dizziness	MOA: synthetic precursor of norepinephrin May exacerbate symptoms of Ischemic heart disease
Psychosis (hallucinations/delusions)	Pimavanersin (Nuplazid tab 17mg)	34mg daily (two tabs)	Peripheral edema – Confusion	Atypical antipsychotic (inverse agonist and antagonist activity at serotonin 5-HT2A)
	Quetiapine (Seroquel 25, 50, 100)		Agranulocytosis – QT prolongation – Hypothyroidism - Hyperprolactinemia – Tardive dyskinesia	Atypical antipsychotic
Dementia	Rivastigmine (Exelon cap 1.5,3,4.5,6mg) (Exelon patch 10, 20)	6mg BID	Nausea – Loss of appetite – Weight loss	Acetylcholinesterase inhibitors *
	Donepezil (Aricept tab 5,10,23 mg) (Aricept ODT 5,10mg)	23mg daily	Bradycardia – Heart block – Nausea – Vomiting – Diarrhea – Worsens GERD/PU – Worsens asthma/COPD	Start with 5mg qhs for 4 weeks before increasing to 10mg. The 23mg tab shouldn't be used till the patient has been on 10mg for 3 months.
REM behavior disorder	Clonazepam (Klnopin 0.5,1,2mg qhs)			
RLS/PLM	Melatonin 3,6mg qhs			
	Domapine agonists (Pramipexole, Ropinirole, Rotigotine)			
	Opioids, Gabapentin, Clonazepam			
Drooling	Glycopyrolate (Robinul tab 1mg Robinul Forte tab 2mg)	2mg TID	Anticholinergic side effects	Anti-muscarinic that doesn't cross BBB
	Ipratrobium bromide (Atrovent spray)	21µ spray QID		
	Clonidine Modafinil Botox			α1 agonist α2 agonist

*Cholinesterase inhibitors may exaggerate muscle relaxation induced by succinylcholine