

Table 12.1 Medications Used to Treat Essential Tremor, Subcortical Dementias, Huntington's Disease, and Wilson's Disease

Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
Treatment of ET: Beta blockers				
Propranolol (Inderal)	ET	Start at 20 mg twice/day; may titrate to 120-240 mg/day. Sustained release: Start at 120 mg once/day.	Cog: ++ S: ++ A: 0 Motor: ++ D: + Com: + F: ++	Bradycardia, heart block, orthostasis, fatigue, dizziness. Avoid using with cocaine, amphetamines, and decongestants such as pseudoephedrine medications that increase sympathetic tone— increase in heart rate and arrhythmia may occur.
Metoprolol (Lopressor, Toprol)	ET	Start at 50 mg once/day; may titrate to 200 mg/day in divided doses. Sustained release: 200 mg once/day.	Cog: + S: + A: 0 Motor: ++ D: + Com: + F: ++	Bradycardia, heart block, orthostasis, fatigue, dizziness. Avoid using with cocaine, amphetamines, and decongestants such as pseudoephedrine medications that increase sympathetic tone— increase in heart rate and arrhythmia may occur.
Treatment of ET: Anticonvulsants				
Primidone (Mysoline)	ET	Start at 12.5 mg/day at bedtime; may titrate to 250 mg/day.	Cog: +++ S: +++ A: ++ Motor: +++ D: +++ Com: +++ F: +++	Sedation, lethargy, decreased cognition, decreased attention, hyperactivity, depression, nystagmus, ataxia, skin rash.
Gabapentin (Neurontin)	ET	Start at 300 mg 3 times/day; may titrate to 1800 mg/day in divided doses.	Cog: ++ S: ++ A: + Motor: +++ D: 0 Com: ++ F: +++	Peripheral edema, tremor, dizziness, fatigue, ataxia, drowsiness, weight gain, behavioral changes.
Treatment of ET: Benzodiazepines				
Clonazepam (Klonopin)	ET	Start at 0.25 mg/day; may titrate to 6 mg/day in divided doses.	Cog: + S: + A: ++ Motor: ++ D: ++ Com: ++ F: +	Sedation, impaired cognition, dysphagia, ataxia, headache, fatigue, nausea. Avoid combining with alcohol. Risk of dependence or addiction.
Diazepam (Valium)	ET	Start at 1 mg once/day; may titrate to 10 mg/day in divided doses.	Cog: ++++ S: ++++ A: ++ Motor: +++ D: ++ Com: ++++ F: ++++	Sedation, impaired cognition, dysphagia, ataxia, headache, fatigue, nausea. Avoid combining with alcohol. Risk of dependence or addiction. Half-life is 43 h; has active metabolite.
Lorazepam (Ativan)	ET	Start at 1 mg once/day; may titrate to 10 mg/day in divided doses.	Cog: +++ S: +++ A: ++ Motor: +++ D: ++	Sedation, impaired cognition, dysphagia, ataxia, headache, fatigue, nausea. Avoid combining with alcohol. Risk of dependence or addiction.

From L. Carl, J. Gallo, and P. Johnson, 2014, *Practical Pharmacology in Rehabilitation: Effect of Medication on Therapy* (Champaign, IL: Human Kinetics).

Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
			Com: ++ F: ++	
Treatment of ET: Botulinum toxin				
Botulinum toxin type A	ET	Varies by site of intramuscular injection. Dose for voice tremor: >1.25 units. Dose for head tremor: <400 units. Repeat doses every 3-4 mo.	Cog: 0 S: 0 A: 0 Motor: ++ D: +++ Com: + F: +	May cause paralysis or motor dysfunction of tissues adjacent to the site of injection.
Treatment of cognitive symptoms of DLB: Acetylcholine esterase inhibitors				
Tacrine* (Cognex)	Cognitive symptoms of DLB	40-160 mg/day in 4 divided doses. Decrease dose for liver disease.	Cog: ++ S: ++ A: + Motor: ++ D: +++ Com: ++ F: +++	Dysphagia secondary to nausea, vomiting, abdominal pain, diarrhea, dyspepsia, anorexia.
Donepezil (Aricept) regular and quick-dissolving tablets	Cognitive symptoms of DLB	Start at 5 mg/day; titrate to 10 mg/day after 4 wk.	Cog: ++ S: 0 A: ++ Motor: + D: +++ Com: ++ F: ++	Dysphagia secondary to nausea, vomiting, abdominal pain, diarrhea, dyspepsia, anorexia. Decrease dose for liver or renal disease.
Rivastigmine (Exelon) capsule, solution, and transdermal patch	Cognitive symptoms of DLB	Start at 1.5 mg twice/day and increase by 3 mg every 2 wk to 6-12 mg/day. Transdermal patch: Start at 4.6 mg/day and increase to 9.5 mg/day after 4 wk.	Cog: ++ S: 0 A: ++ Motor: + D: +++ Com: ++ F: ++	Dysphagia secondary to nausea, vomiting, abdominal pain, diarrhea, dyspepsia, anorexia.
Galantamine (Razadyne)	Cognitive symptoms of DLB	Start at 4 mg twice/day and increase by 8 mg every 4 wk to maximum dose of 16-24 mg/day. Extended-release: Start at 8 mg once/day.	Cog: ++ S: 0 A: ++ Motor: + D: +++ Com: ++ F: ++	Dysphagia secondary to nausea, vomiting, abdominal pain, diarrhea, dyspepsia, anorexia. Decrease dose for severe renal disease or liver disease.
Treatment of motor symptoms of DLB or PSP: Muscle relaxant				
Baclofen (Lioresal)	Motor symptoms of DLB and PSP	Adults: Start at 5 mg 3 times/day; titrate by 5 mg/day every 3 days to maximum dose of 80 mg/day.	Cog: ++ S: +++ A: ++ Motor: +++ D: ++ Com: ++ F: +++	Oral: Initial sedation, muscle weakness, ataxia, orthostatic hypotension, fatigue, headache, nausea, dizziness; confusion and hallucinations reported in the elderly or those with history of stroke. Intrathecal: Chronic constipation, hypotonia, somnolence, headache, vomiting, paresthesias.
Treatment of psychotic symptoms of DLB: Second-generation antipsychotics				
Clozapine	Psychotic	Start at 12.5-25 mg in	Cog: ++++	Weight gain: ++++

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Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
(Clozaril)	symptoms of DLB	1-2 divided doses and increase to 300-450 mg/day. Must be in divided doses to sustain effects.	S: ++++ A: ++ Motor: + D: ++++ Com: ++++ F: ++++	Seizure: ++++ Cardiac: +++ Sexual: + Use requires enrollment in Risk Evaluation and Mitigation Strategy program for monitoring for agranulocytosis. Use only when other agents have failed.
Quetiapine (Seroquel)	Psychotic symptoms of DLB	Start at 50 mg in 2-3 divided doses and increase to 300-400 mg/day. Must be in divided doses to sustain effects.	Cog: ++ S: ++ A: + Motor: ++ D: + Com: ++ F: +++	Weight gain: ++ Seizure: 0 Cardiac: ++ Sexual: + High risk for orthostasis and falls.
Aripiprazole (Abilify)	Psychotic symptoms of DLB	Start at 10-15 mg once/day and increase to 10-15 mg/day. May be once-daily dose.	Cog: + S: + A: + Motor: + D: + Com: + F: ++	Weight gain: + Seizure: 0 Cardiac: + Sexual: +

Treatment of vascular dementia

Medications and lifestyle changes	Vascular dementia	Treat underlying causes of hypertension and hyperlipidemia with medications and lifestyle changes (i.e., weight loss, diet therapy, exercise, and smoking cessation).		
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Treatment of motor symptoms of PSP: Tricyclic antidepressant

Amitriptyline (Elavil)	Motor symptoms of PSP	Start at 50 mg/day and slowly titrate to 150 mg/day. Maximum dose of 300 mg/day. May be once-daily dose at bedtime to minimize sedation.	Cog: ++++ S: ++++ A: 0 Motor: ++ D: ++++ Com: ++++ F: ++++	Weight gain: +++ Seizure: +++ Cardiac: +++ Sexual: ++ Not recommended in elderly due to high sedative and anticholinergic effects that increase fall risk. Elderly or adolescents may require lower doses (50 mg/day in divided doses).
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Treatment of motor symptoms of CBD or DLB: Dopamine agonists

Carbidopa-levodopa (Sinemet)	Motor symptoms of CBD and DLB	Start at 25/100 mg 3 times/day and increase by 1 tablet every 24-48 h. Sustained-release: Start at 50/200 mg twice/day and increase dose or interval every 3 days. Maximum dose of 800 mg of levodopa/day.	Cog: +++ S: +++ A: +++ Motor: +++ D: +++ Com: ++ F: ++++	Nausea, vomiting, headache, drowsiness, nightmares. Avoid high-protein meals, which can decrease absorption, near bedtime. Take on an empty stomach. Avoid driving or operating machinery.
Bromocriptine (Parlodel)	Motor symptoms of CBD	Start at 1.25 mg twice/day with meals and increase by 2.5 mg/day every 14-28 days to 10-50 mg/day	Cog: +++ S: +++ A: +++ Motor: +++ D: +++	Nausea, dyskinesia, hallucinations, confusion, on-off phenomenon, dizziness, drowsiness, vomiting, visual disturbance, insomnia, depression, hypotension, constipation, retroperitoneal fibrosis (rare), impulse-control

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		in 2-3 divided doses. Maximum dose of 100 mg/day.	Com: ++ F: +++	disorders.
Pramipexole (Mirapex)	Motor symptoms of CBD	Start at 0.125 mg 3 times/day; titrate to 0.375 mg/day after 1 wk and increase by 0.75 mg/day weekly. Maximum dose of 4.5 mg/day.	Cog: +++ S: +++ A: +++ Motor: +++ D: +++ Com: ++ F: +++	Nausea, fainting spells, lightheadedness, sweating, flushing, xerostomia, sleep attacks. Contact physician if sleep attack occurs. Avoid using alcohol and driving or operating machinery. Treat xerostomia with sugarless gum or drinking water.
Ropinirole (Requip)	Motor symptoms of CBD	Start at 2.5 mg 3 times/day and increase by 0.75 mg/day weekly for 4 wk, then by 1.5 mg weekly to 9 mg/day; titrate by 3 mg/day weekly to a maximum dose of 24 mg/day.	Cog: +++ S: +++ A: +++ Motor: +++ D: +++ Com: ++ F: +++	Nausea, fainting spells, lightheadedness, sweating, flushing, xerostomia, sleep attacks. Contact physician if sleep attack occurs. Avoid using alcohol and driving or operating machinery. Treat xerostomia with sugarless gum or drinking water.
Treatment of motor symptoms of Huntington's disease				
Tetrabenazine (Xenazine)	Motor symptoms of Huntington's disease	Start at 12.5 mg and increase to 25 mg after 1 wk; then titrate by 12.5 mg weekly to effect. Doses >37.5 mg/day should be in 3 divided doses. Maximum dose of 100 mg/day.	Cog: ++ S: ++ A: ++ Motor: +++ D: ++ Com: ++ F: +++	Akathisia, depression, parkinsonism, dizziness, drowsiness, fatigue, nervousness, anxiety.
Initial chelation therapy for WD				
D-penicillamine (Cuprimine)	Used to remove excess copper causing WD	Adults: 250 mg by mouth 4 times/day, either 1 h before or 2 h after meals. Children: 20 mg/kg by mouth/day in 4 divided doses, either 1 h before or 2 h after meals. Maximum dose of 1 g/day.	Cog: 0 S: 0 A: 0 Motor: +++ D: ++ Com: + F: +++	Drug-induced lupus, myasthenia gravis, neuropathies (peripheral, sensory, and motor), reversible optic neuritis, gastrointestinal upset, tinnitus, diarrhea, nausea, vomiting, loss of appetite, loss of taste, oral ulcerations, bone marrow depression, proteinuria that can lead to renal failure, dystonia, skin reactions, respiratory fibrosis, pneumonitis.
Trientine (Syprine)	Used for chelation of excess copper causing WD	Adults and children ≥12 yr: 1-1.5 g/day in 2-4 divided doses either 1 h before or 2 h after meals. Maximum dose of 2 g/day. Children <12 yr: 20 mg/kg in 2-4 divided doses either 1 h before or 2 h after meals. Maximum dose of 1.5 g/day.	Cog: 0 S: 0 A: 0 Motor: ++ D: 0 Com: 0 F: ++	Abnormal muscle contractions or spasms, lupus, muscle weakness, severe allergic reactions, skin reactions. Used in patients with intolerance to penicillamine therapy.

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Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
Maintenance therapy for WD				
Zinc acetate (Galzin)	Used to maintain healthy levels of copper after successful chelation therapy for WD	Adults: 50 mg (as elemental) 3 times/day, either 1 h before or 2 h after meals. Children: 25 mg 3 times/day, either 1 h before or 2 h after meals.	Cog: 0 S: 0 A: 0 Motor: 0 D: 0/+ Com: 0 F: 0	Gastric upset; take with food.

*Only used after other agents have failed; second-line therapy.

Cog = cognition; S = sedation; A = agitation or mania; Motor = discoordination; D = dysphagia; Com = communication; F = falls; CBD = corticobasilar degeneration; DLB = Lewy body dementia; ET = essential tremor; PSP = progressive supranuclear palsy; WD = Wilson's disease.

The likelihood rating scale for encountering the side effects is as follows: 0 = Almost no probability of encountering side effects. 0/+ = Slight probability of encountering side effects with higher doses. + = Little likelihood of encountering side effects. +/+ = Low probability of encountering side effects; however, probability increases with increased dosage. ++ = Medium likelihood of encountering side effects. +++ = High likelihood of encountering side effects, particularly with high doses. ++++ = Highest likelihood of encountering side effects; best to avoid in at-risk patients.