

Table 14.4 Pain Medications and Adjuvant Analgesic Medications Used in Cancer Patients

Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
<b>Opiates</b>				
Oxycodone (Oxycontin)	Visceral and somatic pain; adjunct to other agents for severe neuropathic pain	Varies with route and patient response. 200 mg oral = 300 mg of oral morphine.	Cog: ++ S: ++ A: + Motor: +++ D: ++ Com: ++ F: +++	Constipation, nausea, vomiting, sedation, respiratory depression, impaired cognition and communication, increased motor discoordination, increased risk of falls. Intraspinal dosing reduces side effects.
Morphine (MS Contin)	Visceral and somatic pain; adjunct to other agents for severe neuropathic pain	Varies with route and patient response. 300 mg oral = 100 mg IV = 10 mg via epidural administration and 1 mg intrathecal.	Cog: ++ S: ++ A: + Motor: +++ D: ++ Com: ++ F: +++	Constipation, nausea, vomiting, sedation, respiratory depression, impaired cognition and communication, increased motor discoordination, increased risk of falls. Intraspinal dosing reduces side effects. Hydrophilic; spreads easily to CSF when given by intraspinal route. Itching occurs due to histamine release with intraspinal dosing; treat with diphenhydramine (Benadryl).
Hydromorphone (Dilaudid)	Visceral and somatic pain; adjunct to other agents for severe neuropathic pain	Varies with route and patient response. 60 mg oral = 20 mg IV = 2 mg via epidural administration and 0.25 mg intrathecal. All equivalent to 300 mg of oral morphine.	Cog: ++ S: ++ A: + Motor: +++ D: ++ Com: ++ F: +++	Constipation, nausea, vomiting, sedation, respiratory depression, impaired cognition and communication, increased motor discoordination, increased risk of falls. Intraspinal dosing reduces side effects. Hydrophilic; has intermediate spread to CSF when given by intraspinal route. Itching occurs due to histamine release with intraspinal dosing; treat with diphenhydramine (Benadryl).
Fentanyl (Duragesic)	Visceral and somatic pain; adjunct to other agents for severe neuropathic pain	Varies with route and patient response. 2 mg oral = 1 mg IV = 0.1 mg via epidural administration and 0.01 mg intrathecal. All equivalent to 300 mg of oral morphine.	Cog: ++ S: ++ A: + Motor: +++ D: ++ Com: ++ F: +++	Constipation, nausea, vomiting, sedation, respiratory depression, impaired cognition and communication, increased motor discoordination, increased risk of falls. Intraspinal dosing reduces side effects. Lipophilic; has low spread to CSF when given by intraspinal route. Itching occurs due to histamine release with intraspinal dosing; treat with diphenhydramine (Benadryl).
<b>Corticosteroids</b>				
Dexamethasone (Decadron)	Inflammation	2- 6 mg by mouth or IV every 6 h	Cog: ++ S: 0 A: ++ Motor: ++ D: ++ Com: + F: ++	Gastrointestinal upset and ulceration, hyperglycemia, confusion, increased risk of infection.
Prednisone	Inflammation	5-20 mg 1-3 times/day	Cog: ++ S: 0 A: ++ Motor: ++ D: ++	Gastrointestinal upset and ulceration, hyperglycemia, confusion, increased risk of infection.

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: ++	
Anticonvulsants: Used to treat neuropathic pain. Monitor for liver, hematologic, and renal changes, as well as rash. Anticonvulsant hypersensitivity syndrome can lead to Stevens-Johnson syndrome.				
Carbamazepine (Tegretol)	Neuropathic pain	200 mg 1-4 times/day	Cog: ++ S: ++ A: + Motor: ++ D: ++ Com: ++ F: +++	Liver: +++ Hematologic: +++ Renal: +++ Rash: +++ Sedation, hypersensitivity reactions, gastrointestinal upset, appetite changes, slowed cognitive function, lethargy, nausea, headaches, irritability, skin rashes, decreased reaction time, nystagmus, ataxia, dysphagia, dysarthria, aplastic anemia. Genetic testing required prior to initiation in Asians (increased risk of AHS).
Phenytoin (Dilantin)	Neuropathic pain	300-400 mg/day	Cog: ++ S: ++ A: 0 Motor: ++ D: +++ Com: +++ F: ++	Liver: ++ Hematologic: +++ Renal: ++ Rash: +++ Sedation, hypersensitivity reactions, gastrointestinal upset, appetite changes, slowed cognitive function, lethargy, nausea, headaches, irritability, skin rashes, decreased reaction time, nystagmus, ataxia, dysphagia, dysarthria, AHS.
Clonazepam (Klonopin)	Neuropathic pain	0.25-0.5 mg 3 times/day	Cog: + S: + A: ++ Motor: ++ D: ++ Com: ++ F: +	Sedation, gastrointestinal upset, appetite changes, ataxia, headache, fatigue, dependence.
Gabapentin (Neurontin)	Neuropathic pain	100-1200 mg 3 times/day; adjust for renal impairment	Cog: ++ S: ++ A: + Motor: +++ D: 0 Com: ++ F: +++	Liver: 0 Hematologic: 0 Renal: +++ Rash: +  Sedation, gastrointestinal upset, appetite changes, ataxia, gait changes, tremor, dizziness, fatigue, ataxia, drowsiness, behavioral changes, peripheral edema, weight gain.
Keppra (Levetiracetam)	Neuropathic pain	20-40 mg/kg/day; adjust for renal impairment	Cog: +++ S: +++ A: 0 Motor: +++ D: + Com: ++ F: +++	Liver: 0 Hematologic: + Renal: +++ Rash: + Somnolence, tiredness, dizziness, upper-respiratory infections. Pyridoxine decreases psychiatric side effects.
Lamotrigine (Lamictal)	Neuropathic pain	5-15 mg/kg/day	Cog: ++ S: 0	Liver: + Hematologic: 0

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Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
			A: ++ Motor: + D: 0 Com: ++ F: ++	Renal: + Rash: + Anticonvulsant hypersensitivity syndrome, rash that can progress to Stevens-Johnson syndrome, insomnia. Avoid in pregnancy.
Pregabalin (Lyrica)	Neuropathic pain	Start at 75 mg twice/day and increase to 150 mg twice/day in 1 wk; titrate to effective dose of 150-225 mg twice/day; adjust for renal impairment	Cog: ++ S: ++ A: + Motor: +++ D: 0 Com: ++ F: +++	Liver: 0 Hematologic: 0 Renal: +++ Rash: + Dizziness, somnolence, dry mouth, edema, blurred vision, weight gain, difficulty with concentration and attention.
Topiramate (Topamax)	Neuropathic pain	Start at 25 mg twice/day and then increase by 50 mg/day in divided doses once weekly to 200 mg twice/day	Cog: ++ S: ++ A: ++ Motor: +++ D: + Com: +++ F: ++	Liver: 0 Hematologic: 0 Renal: +++ Rash: ++ Dizziness, somnolence, dry mouth, edema, blurred vision, weight gain, difficulty with concentration and attention, language impairment, behavioral changes, weight loss, altered taste, metabolic acidosis, kidney stones, hypohidrosis.
Valproic acid (Depakene)	Neuropathic pain	250-2500 mg 2-4 times/day	Cog: ++ S: ++ A: ++ Motor: ++ D: ++ Com: ++ F: ++	Liver: ++ Hematologic: +++ Renal: 0 Rash: +++ Tremor, dyspepsia, weight gain, anticonvulsant hypersensitivity syndrome, hepatotoxicity, pancreatitis, alopecia, thrombocytopenia, sedation, appetite changes, gastrointestinal upset, rash.
Tricyclic antidepressants				
Amitriptyline (Elavil)	Neuropathic pain	25-150 mg/day at bedtime	Cog: ++++ S: ++++ A: 0 Motor: ++ D: ++++ Com: ++++ F: ++++	Weight gain: +++ Seizure: ++++ Cardiac: +++ Sexual: + Not recommended in elderly. Impaired cognition, sedation, risk of seizure, cardiac arrhythmia, sexual dysfunction, orthostasis, gastrointestinal upset.
Desipramine (Norpramin)	Neuropathic pain	25-300 mg/day at bedtime	Cog: ++ S: ++ A: + Motor: ++ D: ++ Com: ++ F: ++	Weight gain: + Seizure: ++ Cardiac: ++ Sexual: ++ Prolongs QT interval. Impaired cognition, sedation, risk of seizure, cardiac arrhythmia, sexual dysfunction, orthostasis, gastrointestinal upset.
Doxepin (Sinequan)	Neuropathic pain	25-150 mg/day at bedtime	Cog: ++++ S: ++++ A: 0	Weight gain: ++ Seizure: +++ Cardiac: +++

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Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
			Motor: ++ D: +++ Com: ++++ F: ++	Sexual: ++ Impaired cognition, sedation, risk of seizure, cardiac arrhythmia, sexual dysfunction, orthostasis, gastrointestinal upset.
Imipramine (Tofranil)	Neuropathic pain	20-100 mg/day at bedtime	Cog: +++ S: +++ A: + Motor: ++ D: +++ Com: +++ F: ++++	Weight gain: ++ Seizure: +++ Cardiac: +++ Sexual: ++ Impaired cognition, sedation, risk of seizure, cardiac arrhythmia, sexual dysfunction, orthostasis, gastrointestinal upset.
Nortriptyline (Pamelor)	Neuropathic pain	25-250 mg/day at bedtime	Cog: ++ S: ++ A: 0 Motor: ++ D: ++ Com: ++ F: +	Weight gain: + Seizure: ++ Cardiac: ++ Sexual: ++ Impaired cognition, sedation, risk of seizure, cardiac arrhythmia, sexual dysfunction, orthostasis, gastrointestinal upset.
Trazodone (Desyrel)	Neuropathic pain	75-225 mg/day at bedtime	Cog: ++++ S: ++++ A: 0 Motor: ++ D: ++ Com: +++ F: +++	Weight gain: + Seizure: ++ Cardiac: + Sexual: + Impaired cognition, sedation, risk of seizure, cardiac arrhythmia, sexual dysfunction, orthostasis, gastrointestinal upset.
Norepinephrine and serotonin reuptake inhibitor antidepressants				
Duloxetine (Cymbalta)	Neuropathic pain	Start at 20 mg and titrate weekly to 60 mg/day	Cog: + S: 0 A: + Motor: 0 D: ++ Com: 0 F: +	Nausea, dry mouth, constipation, somnolence, hyperhidrosis, decreased appetite, increased suicide risk (children, adolescents, and young adults), hepatotoxicity, orthostasis, serotonin syndrome, neuroleptic malignant syndrome, hypomania, seizures, urinary retention, hyponatremia, altered glucose levels. May interact with CYP1A2 and CYP2D6 inhibitors.
Venlafaxine (Effexor)	Neuropathic pain	Start at 37.5 mg and titrate to 225 mg/day. Maximum dose of 375 mg/day.	Cog: + S: + A: 0/+ Motor: 0 D: + Com: + F: +	Somnolence, nausea, dry mouth, decreased appetite, constipation; jitteriness and insomnia at higher doses.
Muscle relaxant				
Baclofen (Lioresal)	Spasticity	10-15 mg/day in 3 divided doses; titrate in increments of 1-15 mg/day every 3 days to maximum dose of 60 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. Abrupt discontinuation may result in rebound increase in spasticity, rhabdomyolysis, disorientation, hallucination, and seizures.

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				Intrathecal: Chronic constipation, hypotonia, somnolence, headache, vomiting, paresthesias.
<b>Antihistamines</b>				
Hydroxyzine (Vistaril)	Anxiety, nausea, insomnia	25-50 mg by mouth or IV every 4-6 h as needed	Cog: ++ S: ++ A: ++ Motor: ++ D: ++ Com: ++ F: ++	Dry mouth, sedation, orthostasis, confusion, impaired cognition.
Promethazine (Phenergan)	Anxiety, nausea, insomnia	12.5-50 mg by mouth or IM every 4-6 h	Cog: ++ S: ++ A: ++ Motor: ++ D: ++ Com: ++ F: ++	Dry mouth, sedation, orthostasis, confusion, impaired cognition.
<b>Anesthetics</b>				
Lidocaine	Neuropathic pain	5 mg/kg	Cog: +++ S: +++ A: + Motor: +++ D: ++ Com: ++ F: +++	Sedation, gastrointestinal upset, confusion, tremor, ataxia, seizures.
Tocainide (Tonocard)	Neuropathic pain	400-600 mg 3 times/day	Cog: +++ S: +++ A: + Motor: +++ D: ++ Com: ++ F: +++	Sedation, gastrointestinal upset, confusion, tremor, ataxia, seizures.
<b>Psychostimulants</b>				
Dextroamphetamine	Used to decrease sedation	5- 10 mg/day	Cog: ++ S: 0 A: ++ Motor: ++ D: ++ Com: + F: ++	Tremor, xerostomia, altered taste, decreased appetite.
Methylphenidate (Ritalin)	Used to decrease sedation	10-15 mg/day	Cog: ++ S: 0 A: ++ Motor: ++ D: ++ Com: + F: ++	Tremor, xerostomia, altered taste, decreased appetite.

Cog = cognition; S = sedation; A = agitation or mania; Motor = discoordination; D = dysphagia; Com = communication; F = falls; CSF = cerebral spinal fluid; IM = intramuscularly; IV = intravenously; AHS = anticonvulsant hypersensitivity syndrome. 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. ++ = Moderate likelihood of encountering side effects. +++ = High likelihood of encountering side effects.

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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.