

Table 24.7 Medications Used to Treat Gastric-Emptying Disorders

Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
Agents that affect LES function				
Nifedipine (Procardia XL)	Calcium channel blocker that relaxes LES in treatment of achalasia or gastroparesis.	30 mg by mouth once daily.	Cog: + S: 0 A: + Motor: + D: ++ Com: + F: ++	Side effects: Dizziness, flushing, headache, gingival hyperplasia, peripheral edema, mood changes, gastrointestinal side effects. Food and drug interactions: Grapefruit juice (>200 ml) can increase levels of this medication and should not be consumed within 2 h before or 4 h after administration. Decreases liver metabolism of carbamazepine (Tegretol), simvastatin (Zocor), atorvastatin (Lipitor), and lovastatin (Mevacor). This can lead to toxicity from these drugs.
Baclofen (Lioresal)	Inhibits LES relaxation and reduces symptoms of reflux mediated by gamma amino butyric acid at the medullary level.	5 mg by mouth 3 times/day.	Cog: ++ S: +++ A: ++ Motor: +++ D: ++ Com: ++ F: +++	Eliminated by the kidneys; reduce dose with renal dysfunction. Side effects: Initial sedation, muscle weakness, ataxia, orthostatic hypotension, fatigue, headache, nausea, dizziness; confusion and hallucinations reported in the elderly or those with history of stroke. Precautions: Abrupt discontinuance results in rebound increase in spasticity, rhabdomyolysis, disorientation, hallucination, and seizures.
Botulinum toxin (Botox)	Inhibits the release of acetylcholine from nerve terminals in the LES; can induce LES relaxation in achalasia and gastroparesis.	80-200 units injected into LES muscle. Endoscopic procedure must be repeated every several months to reduce achalasia and gastroparesis.	Cog: + S: ++ A: + Motor: ++ D: +++ Com: + F: +	Side effects: Anxiety, back pain, dizziness, drowsiness, dry eyes, dry mouth, flu-like symptoms, headache, increased cough, indigestion, nausea, neck pain, runny nose, sensitivity to light, sweating, stomach upset, reactions at injection site, weakness of the muscles at or near the injection site.
Prokinetic agents				
Metoclopramide (Reglan)	Prokinetic; improves LES function in GERD and promotes gastric emptying; antiemetic agent.	10 mg by mouth or IV 30 minutes before meals and at bedtime. Creatinine clearance <30 ml/min: 5 mg.	Cog: +++ S: +++ A: ++ Motor: +++ D: + Com: +++ F: +++	Side effects: Common—restlessness, drowsiness, dizziness, lassitude, dystonia. Infrequent—headache, extrapyramidal effects such as oculogyric crisis, hypotension, hypertension, hyperprolactinemia leading to galactorrhea, constipation, depression. Drug interactions: Additive sedation when used with other CNS depressants. Antagonizes dopamine-enhancer therapy used in treatment of Parkinson's disease.

Medication	Indications	Dosing	Side effects affecting rehab	Other side effects or considerations
Cisapride (Propulsid)	Promotes gastric emptying and gastrointestinal motility.	10 mg by mouth 15 min before meals and at bedtime.	Cog: ++ S: ++ A: 0 Motor: ++ D: ++ Com: + F: ++	Withdrawn from the U.S. market due to associated serious cardiac arrhythmias and deaths. Cisapride (Propulsid) available for compassionate use for patients that cannot be treated with other agents. Side effects: Diarrhea, abdominal cramping, nausea, flatulence, dry mouth, headache, dizziness, somnolence, fatigue, bone marrow suppression, depression, hepatitis.
Erythromycin	Stimulates motilin receptors in the gastrointestinal smooth muscle, promoting peristalsis.	40-250 mg orally or IV every 6 h.	Cog: + S: 0 A: 0 Motor: ++ D: + Com: + F: ++	Side effects: Allergic reactions, rash, hearing loss when used in renal failure, muscle weakness, hepatotoxicity, QT prolongation with arrhythmia, gastrointestinal upset. Drug interactions: Increased risk for arrhythmia when used with other agents that prolong QT prolongation (e.g. antiarrhythmics, antipsychotics, antidepressants, anesthetics).
Proton pump inhibitors				
Omeprazole (Prilosec)	Reduces acid in GERD or peptic ulcer disease.	40 mg by mouth once daily.	Cog: 0 S: 0 A: 0 Motor: + D: + Com: 0 F: +	Side effects: Abdominal pain, diarrhea, headache, dizziness, reduced calcium and magnesium absorption, increased bone fracture. Drug interactions: Can reduce effectiveness of clopidogrel (Plavix) therapy.
Esomeprazole (Nexium)	Reduces acid in GERD or peptic ulcer disease.	40 mg by mouth or IV once daily.	Cog: 0 S: 0 A: 0 Motor: + D: + Com: 0 F: +	Side effects: Abdominal pain, diarrhea, headache, dizziness, reduced calcium and magnesium absorption, increased bone fracture. Drug interactions: Can reduce effectiveness of clopidogrel (Plavix) therapy.
Lansoprazole (Prevacid)	Reduces acid in GERD or peptic ulcer disease.	30 mg by mouth once daily.	Cog: 0 S: 0 A: 0 Motor: + D: + Com: 0 F: +	Side effects: Abdominal pain, diarrhea, headache, dizziness, reduced calcium and magnesium absorption, increased bone fracture. Drug interactions: Can reduce effectiveness of clopidogrel (Plavix) therapy.
Rabeprazole (Aciphex)	Reduces acid in GERD or peptic ulcer disease.	20 mg by mouth once daily.	Cog: 0 S: 0 A: 0 Motor: + D: + Com: 0 F: +	Side effects: Abdominal pain, diarrhea, headache, dizziness, reduced calcium and magnesium absorption, increased bone fracture. Drug interactions: Can reduce effectiveness of clopidogrel (Plavix) therapy.
Pantoprazole (Protonix)	Reduces acid in GERD or peptic	40 mg by mouth or IV once daily.	Cog: 0 S: 0	Side effects: Abdominal pain, diarrhea, headache, dizziness, reduced calcium and

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	ulcer disease.		A: 0 Motor: + D: + Com: 0 F: +	magnesium absorption, increased bone fracture. Drug interactions: Can reduce effectiveness of clopidogrel (Plavix) therapy but carries the lowest risk of this drug interaction.
Antireflux agent				
Alginic acid (Gaviscon)	Produces a foam layer on top of stomach contents, reducing reflux of stomach acid.	1 tablet by mouth before meals and at bedtime.	Cog: + S: 0 A: 0 Motor: + D: + Com: 0 F: +	Side effects: Decreased absorption of phosphate and magnesium, osteomalacia, encephalopathy, seizures, speech disorders, tremor, dysarthria associated with aluminum toxicity with chronic use in patients with renal failure. Drug interactions: May reduce the absorption of products containing aluminum or calcium or of tetracycline antibiotics; avoid in patients with renal failure due to risk of aluminum toxicity.

Cog = cognition; S = sedation; A = agitation or mania; Motor = discoordination; D = dysphagia; Com = communication; F = falls; CNS = central nervous system; GERD = gastroesophageal reflux disease; LES = lower esophageal sphincter; IV = intravenously.

The likelihood rating scale for encountering the side effects is as follows: 0 = Almost no probability of encountering side effects. + = 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.