

Introduction	<ul style="list-style-type: none"> Nausea is an unpleasant sensory and emotional experience associated with the feeling of fullness in the epigastric and upper abdominal area, with or without a need to vomit¹ Spasmodic contraction of abdominal muscles against a closed glottis can cause dry heaving Management of nausea at end of life can be challenging since patients may present with several underlying sources of this symptom
Prevalence	<ul style="list-style-type: none"> 50 to 60% of patients with advanced cancer experience nausea² Prevalence is also high in patients receiving radiation therapy and/or chemotherapy and those with renal, heart and/or liver failure 70% of patients, overall, may experience moderate to severe nausea in the final week of life³
Common Causes ⁴	<p>V Vestibular (involves cholinergic and histaminic (H₁) receptors)</p> <ul style="list-style-type: none"> Motion sickness/vertigo <p>O Obstruction of the bowel (cholinergic, histaminic, serotonin (5-HT₃))</p> <ul style="list-style-type: none"> Malignancy, bowel obstruction (including malignant bowel obstruction (MBO)), gastroparesis, severe constipation <p>M dysMotility of the upper gut (cholinergic, histaminic, serotonin (5-HT₃, 5-HT₄))</p> <p>Partial bowel obstruction, gastroparesis</p> <p>I Infection, Inflammation (cholinergic, histaminic, serotonin (5-HT₃), neurokinin (N₁))</p> <ul style="list-style-type: none"> Pain, malignancy, increased intracranial pressure (ICP), gastroenteritis, ascites, pancreatitis <p>T Toxins stimulating the brain's chemoreceptor trigger-zone (dopamine (D₂), serotonin (5-HT₃))</p> <ul style="list-style-type: none"> Medications such as opioids, iron, cytotoxic chemotherapy, antibiotics, and NSAIDS Organ failure (liver and renal) and metabolic disorders (bone metastases, uremia, electrolyte disturbances) <p>Psychogenic - Anxiety, anticipatory, pain</p>
Palliative Care Approach	<ul style="list-style-type: none"> Early discussions with patients and caregivers on recognizing the signs of nausea and associated symptoms Guidance on how and when to give/take medications Counseling on adverse effects Direction on what to do if current management is inadequate⁵ Patient-centered and care plan-based approach can reduce anxiety associated with nausea
Non-Pharmacological Treatment	<ul style="list-style-type: none"> Avoid certain sounds, smells, foods, and motion (all can exacerbate nausea) If bowel obstruction is source of nausea, surgical intervention or endoscopic tubes can relieve nausea; however must be consistent with patient goals of care due to associated risk Adequate hydration Complementary and alternative therapies including relaxation, imagery, self-hypnosis, acupuncture, acupressure, ginger, and aromatherapy⁶

Class	Medication	Indication(s)	Suggested Initial Dosage ⁸ (Scheduled or PRN)	Adverse Effects
Dopamine blockers	Haloperidol (Haldol [®])	Opioid-induced Metabolic MBO ⁹	0.5mg PO/IM/SC every 6 hours	Extrapyramidal symptoms (EPS) (involuntary or uncontrollable movements, tremors, muscle contractions)
	Chlorpromazine (Thorazine [®])		10mg PO/IV/IM every 6 hours	
	Metoclopramide (Reglan [®])	Gastric stasis (gastroparesis) Partial bowel obstruction ⁹	5-10mg PO/IM/IV 3 to 4 times a day	Restlessness, sedation, fatigue, EPS, esophageal spasms, GI colic Use cautiously in older adults, at higher doses, and with complete bowel obstruction
	Prochlorperazine (Compazine [®])	Various causes	PO IV/IM: 5mg every 6 hours PR: 25mg every 12 hours	EPS, anticholinergic symptoms (dry mouth, constipation, blurred vision), sedation, anxiety
	Olanzapine (Zyprexa [®]) ¹⁰	Refractory nausea Cancer	2.5mg PO Daily	Sedation, weight gain, dry mouth, hyperglycemia, QT prolongation
Serotonin blocker	Ondansetron (Zofran [®])	Chemotherapy- & radiation-induced ¹¹	4mg PO every 8 hours	Constipation, headache
Histamine blockers	Diphenhydramine (Benadryl [®])	Vestibular and central nervous system causes	25mg PO/IV every 6 hours	Dry mouth, blurred vision, drowsiness, sedation, constipation, urinary retention
	Hydroxyzine (Atarax [®])		10mg PO every 6 hours	
	Meclizine (Antivert [®])		12.5mg PO every 6 hours	
	Promethazine (Phenergan [®])		12.5mg PO/IM/PR every 6 hours	
Anticholinergic	Scopolamine (Transderm Scop [®])	Advanced cancer	Apply 1 patch behind the ear every 72 hours (3 days)	
	Hyoscyamine (Levsin [®])	Vestibular mechanisms	0.125mg PO/SL every 4 hours	
	Dicyclomine (Bentyl [®])	MBO ⁹	10mg PO every 6 hours	
Macrolide	Erythromycin	Gastric stasis (gastroparesis)	250mg PO TID, 30 minutes before meals	
Anxiolytic	Lorazepam (Ativan [®])	Anticipatory Recommended as adjunct only	0.5mg PO/SL/IM/IV/SC every 6 hours	Drowsiness, dizziness, change in appetite, headaches, insomnia
Corticosteroids	Dexamethasone (Decadron [®])	Chemotherapy- & radiation-induced ¹¹ Advanced cancer Increased ICP ¹² MBO ^{9,12}	4ng PO/IV/IM/SC BID (usually AM and afternoon)	Infection risk, insomnia, anxiety, euphoria, hyperglycemia
Somatostatin analogue	Octreotide (Sandostatin [®])	MBO ⁹ Intractable vomiting	0.1mg (100mcg) IV/SC TID	Diarrhea, abdominal pain, flatulence, nausea, constipation, pain at injection site

IM = intramuscular; IV = intravenous; ODT = orally disintegrating tablet; PO = by mouth; PR = rectally; SC = subcutaneous

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