

Antiemetic and Antivertigo Drugs

Key Terms

antiemetic	nausea
antivertigo	vertigo
chemoreceptor trigger zone (CTZ)	vestibular neuritis
	vomiting

Chapter Objectives

On completion of this chapter, the student will:

- Define the terms nausea, vomiting, antiemetic, and antivertigo.
- Discuss the general drug actions, uses, adverse reactions, contraindications, precautions, and interactions of antiemetic and antivertigo drugs.
- Discuss important preadministration and ongoing assessment activities the nurse should perform on the patient receiving an antiemetic or antivertigo drug.
- List nursing diagnoses particular to a patient receiving an antiemetic or antivertigo drug.
- Use the nursing process when administering an antiemetic or antivertigo drug.

An **antiemetic** drug is used to treat or prevent **nausea** (unpleasant gastric sensation usually preceding vomiting) or **vomiting** (forceful expulsion of gastric contents through the mouth). An **antivertigo** drug is used to treat or prevent **vertigo** (a feeling of a spinning or rotation-type motion) that may occur with motion sickness, Ménière's disease of the ear, middle and inner ear surgery, and other disorders.

Vomiting caused by drugs, radiation, and metabolic disorders usually occurs because of stimulation of the **chemoreceptor trigger zone (CTZ)**, a group of nerve fibers located on the surface of the fourth ventricle of the brain. When these fibers are stimulated by chemicals, such as drugs or toxic substances, impulses are sent to the vomiting center located in the medulla. The vomiting center may also be directly stimulated by disorders such as gastrointestinal irritation, motion sickness, and **vestibular neuritis** (inflammation of the vestibular nerve).

ACTIONS

These drugs appear to act primarily by inhibiting the CTZ or by depressing the sensitivity of the vestibular apparatus of the inner ear. Those that act on the CTZ

are more effective for vomiting caused by stimulation of the CTZ, whereas those that act on the vestibular apparatus of the inner ear are more effective for vertigo associated with motion sickness and middle and inner ear surgeries.

USES

Antiemetic Drugs

An antiemetic is used to prevent (prophylaxis) or treat nausea and vomiting. An example of prophylactic use is the administration of an antiemetic before surgery to prevent vomiting during the immediate postoperative period when the patient is recovering from anesthesia. Another example is giving an antiemetic before administration of one or a combination of antineoplastic drugs (drugs used in the treatment of cancer; see Chap. 55), which have a high incidence of causing vomiting.

Dronabinol is the only currently available derivative of THC, which is a derivative of the active substance found in marijuana. Dronabinol is a second-line antiemetic and is used after treatment with other antiemetics has failed.

Other causes of nausea and vomiting that may be treated with an antiemetic include radiation therapy for a malignancy, bacterial and viral infections, nausea and vomiting caused by drugs, Ménière's disease and other ear disorders, and neurological diseases and disorders. Some of these drugs also are used to treat the nausea and vomiting seen with motion sickness. Some antiemetics also are antivertigo drugs (see the Summary Drug Table: Antiemetic and Antivertigo Drugs).

Antivertigo Drugs

An antivertigo drug is used to treat vertigo, which is usually accompanied by light-headedness, dizziness, and weakness. The individual often has difficulty walking. Some of the causes of vertigo include high alcohol consumption during a short time, certain drugs, inner ear disease, and postural hypotension. Motion sickness (seasickness, carsickness) has similar symptoms but is caused by repetitive motion (eg, riding in an airplane, boat, or car). Both vertigo and motion sickness may result in nausea and vomiting.

It is important to note that antivertigo drugs are essentially antiemetics because many of these preparations, whether used for motion sickness or vertigo, also have direct or indirect antiemetic properties. They prevent the nausea and vomiting that occur because of stimulation of the vestibular apparatus in the ear. Stimulation of this apparatus results in vertigo, which is often followed by nausea and vomiting.

ADVERSE REACTIONS

The most common adverse reactions seen with these drugs are varying degrees of drowsiness. Additional adverse reactions for each drug are listed in the Summary Drug Table: Antiemetic and Antivertigo Drugs.

CONTRAINDICATIONS

The antiemetic and antivertigo drugs are contraindicated in patients with known hypersensitivity to these drugs, those in a coma, or those with severe central nervous system (CNS) depression. In general, these drugs are not recommended during pregnancy, lactation, or for uncomplicated vomiting in young children. Metoclopramide is contraindicated in patients with a seizure disorder, breast cancer, pheochromocytoma, or gastrointestinal obstruction. Prochlorperazine is contraindicated in patients with bone marrow depression, blood dyscrasia, Parkinson's

disease, or severe liver or cardiovascular disease. Thiethylperazine is classified as Pregnancy Category X and is contraindicated during pregnancy.

PRECAUTIONS

Severe nausea and vomiting should not be treated with antiemetic drugs alone. The cause of the vomiting must be investigated. Antiemetic drugs may hamper the diagnosis of disorders such as brain tumors, appendicitis, intestinal obstruction, or drug toxicity (eg, digitalis toxicity). Delayed diagnosis of any of these disorders could have serious consequences for the patient.

Antiemetics and antivertigo drugs are used cautiously in patients with glaucoma or obstructive disease of the gastrointestinal or genitourinary system, those with renal or hepatic dysfunction, and in older men with possible prostatic hypertrophy. Promethazine is used cautiously in patients with hypertension, sleep apnea, or epilepsy. Trimethobenzamide is used cautiously in children with a viral illness because it may increase the risk of Reye's syndrome.

Perphenazine, prochlorperazine, promethazine, scopolamine, chlorpromazine, and trimethobenzamide are Pregnancy Category C drugs. The pregnancy category of diphenidol is unknown. Other antiemetics and antivertigo drugs are classified as Pregnancy Category B (except for thiethylperazine, which is classified as Pregnancy Category X).

INTERACTIONS

The antiemetics and antivertigo drugs may have additive effects when used with alcohol and other CNS depressants such as sedatives, hypnotics, antianxiety drugs, opiates, and antidepressants. There may be additive anticholinergic effects (see Chap. 25) when administered with drugs that have anticholinergic activity such as the antihistamines, antidepressants, phenothiazines, and disopyramide. The antacids decrease absorption of the antiemetics.

When ondansetron is administered with rifampin, blood levels of ondansetron may be reduced, decreasing the antiemetic effect. Dimenhydrinate may mask the signs and symptoms of ototoxicity when administered with ototoxic drugs, such as the aminoglycosides (see Chap. 10), causing irreversible hearing damage. When lithium is administered with prochlorperazine, the risk of extrapyramidal reactions increases (see Chap. 32).

SUMMARY DRUG TABLE ANTIEMETIC AND ANTIVERTIGO DRUGS

GENERIC NAME	TRADE NAME*	USES	ADVERSE REACTIONS	DOSAGE RANGES
buclizine <i>byoo'-kli-zeen</i>	Bucladin-S Softabs	Nausea and vomiting, motion sickness	Drowsiness, confusion, dry mouth, headache, jitteriness, anorexia, nausea, urinary frequency, difficulty urinating	50 mg PO q4–6 hours; maximum dose, 150 mg/d
chlorpromazine hydrochloride <i>klor-proe'-ma-zeen</i>	Thorazine, <i>generic</i>	Control of nausea and vomiting, intractable hiccoughs	Drowsiness, hypotension, postural hypotension, hypertension, bradycardia, hypersensitivity reactions, dry mouth, nasal congestion	Nausea and vomiting: 10–25 mg PO q4–6h PRN; 50–100 mg rectal suppository q6–8h PRN; 25–50 mg IM q3–4h PRN; hiccoughs: 25–50 mg PO, IM, slow IV infusion
cyclizine <i>sy'e'-kli-zeen</i>	Marezine	Nausea and vomiting, motion sickness	Same as buclizine	50 mg PO ½ hour before exposure to motion, may repeat q4–6h; maximum dose, 200 mg/d
dimenhydrinate <i>dye-men-hye'- dri-nate</i>	Dinate, Dramamine, Dramanate, Triptone, <i>generic</i>	Prevention and treatment of nausea, vomiting, dizziness, vertigo of motion sickness	Dizziness, confusion, nervousness, restlessness, nausea, vomiting, diarrhea, blurred vision, palpitations	50–100 mg PO q4–6h PRN, maximum dose, 400 mg/d, 50 mg IM as needed, 50 mg IV
diphenhydramine <i>dye-fen-hye'- dra-meen</i>	Benadryl, <i>generic</i>	Prevention and treatment of motion sickness, antihistamine	Dizziness, sedation, epigastric distress, faintness, allergic reactions, urinary frequency, thickening of bronchial secretions	25–50 mg PO q4–6h 10–50 mg IM, IV
diphenidol <i>di-phen'-i-dol</i>	Vontrol	Vertigo and associated nausea and vomiting, Ménière's disease, middle and inner ear surgery, control of nausea and vomiting in postoperative period, malignancies, inner ear disturbances	Auditory and visual hallucinations, disorientation, drowsiness, dry mouth, nausea, skin rash	25–50 mg PO q4h
dolasetron mesylate <i>doe-laz-e'-tron</i>	Anzemet	Prevention of chemotherapy-induced nausea, vomiting, and postoperative nausea and vomiting	Hypotension, hypertension, electrocardiographic changes, headache, dizziness, light-headedness, fatigue, sedation, hunger, constipation	Before chemotherapy: 100 mg within 1 h before chemotherapy; PO nausea and vomiting: 100 mg or 1.8 mg/kg IV
dronabinol <i>droe-nab'-i-nol</i>	Marinol	Treatment of nausea and vomiting due to antineoplastic drug therapy, appetite stimulant in AIDS patients with weight loss	Palpitations, drowsiness, diarrhea, euphoria, dizziness, paranoid reaction, somnolence, irritability, hallucinations	Antiemetic: 5–15 mg/m ² 1–3 h before chemotherapy, then q2–4h after chemotherapy for a total of 4–6 doses/d; appetite stimulant: 2.5 mg PO BID AC lunch and supper
granisetron hydrochloride <i>gran-iz'-e-tron</i>	Kytril	Prevention and treatment of nausea and vomiting due to antineoplastic drug therapy	Headache, weakness, somnolence, diarrhea, constipation	10 µg/kg infused IV over 5 min, 30 min before chemotherapy, or 1 mg PO BID

SUMMARY DRUG TABLE ANTIEMETIC AND ANTIVERTIGO DRUGS (Continued)

GENERIC NAME	TRADE NAME*	USES	ADVERSE REACTIONS	DOSAGE RANGES
meclizine <i>mek'-li-zeen</i>	Antivert, Antivert/25, Antivert/50, <i>generic</i>	Vertigo, prevention and treatment of nausea and vomiting due to motion sickness	Drowsiness, restlessness, rash, urticaria, anorexia, hypotension, dry mouth, nose, and throat	Vertigo: 25–100 mg/d PO in divided doses; nausea and vomiting: 25–50 mg PO 1 h before travel and repeat 24h PRN
metoclopramide <i>met-oh-kloe-pra'- mide</i>	Reglan, <i>generic</i>	Prevention of nausea and vomiting due to antineoplastic drug therapy	Restlessness, drowsiness, fatigue, lassitude, dizziness, nausea, diarrhea	1–2 mg/kg IV 15–30 min before chemotherapy
ondansetron hydrochloride <i>on-dan'-sa-tron</i>	Zofran	Prevention of nausea and vomiting due to antineoplastic drug therapy, prevention of postoperative nausea and vomiting	Diarrhea, headache, fever, weakness, dry mouth, drowsiness, sedation	Chemotherapy: 3 doses of 0.15 mg/kg IV or 32 mg PO 30 min before chemotherapy; postoperative nausea and vomiting: 4 mg IV
perphenazine <i>per-fen'-a-zeen</i>	Trilafon, <i>generic</i>	Control of nausea and vomiting, intractable hiccoughs	Same as chlorpromazine hydrochloride	8–16 mg/d PO in divided doses, 5–10 mg IM, IV q6h PRN
prochlorperazine hydrochloride <i>proe-klor-per'-a- zeen</i>	Compazine, <i>generic</i>	Control of nausea and vomiting	Same as chlorpromazine hydrochloride	5–10 mg PO TID, QID; 10–20 mg IM, IV; 25 mg rectal suppository BID; 10–15 mg sustained release
promethazine hydrochloride <i>proe-meth'-a-zeen</i>	Phenergan, <i>generic</i>	Treatment of motion sickness, prevention of nausea and vomiting associated with anesthesia and surgery	Same as diphenhydramine hydrochloride	Motion sickness: Initial dose 25 mg PO ½ h before travel and repeat in 8–12 h, then 25 mg PO BID, 12.5–25 mg IM, IV; nausea and vomiting: 12.5–25 mg PO, IM, IV
thiethylperazine maleate <i>thye-eth-il-per'-a- zeen</i>	Torecan	Nausea and vomiting	Same as chlorpromazine hydrochloride	10 mg PO, IM, PRN 1–3 times a day; maximum dose, 30 mg/d
transdermal scopolamine <i>skoe-pol'-a-mine</i> scopolamine, oral	Transderm-Scop Scopace	Prevention of nausea and vomiting due to motion sickness	Drowsiness, dry mouth, blurred vision	One system applied at least 4 h before effect is required, repeat in 3 d if needed; orally, 0.4–0.8 mg PO
triflupromazine <i>trye-flu-proe'-ma- zeen</i>	Vesprin	Severe nausea and vomiting	Drowsiness, insomnia, vertigo, dry mouth, salivation, nausea, vomiting, anorexia, constipation, urinary retention, extrapyramidal effects (see Chap. 30)	5–15 mg IM q4h, maximum dose, 60 mg/d; 1 mg IV up to 3 mg/d
trimethobenzamide hydrochloride <i>trye-meth-oh-ben'- za-mide</i>	Tebamide, T-Gen, Tigan, <i>generic</i>	Control of nausea and vomiting	Hypersensitivity reactions, hypotension (IM use), Parkinson-like symptoms, blurred vision, drowsiness, dizziness	250 mg PO TID, QID; 200 mg IM, rectal suppository TID, QID

*The term *generic* indicates the drug is available in generic form.
AIDS, acquired immunodeficiency syndrome.

NURSING PROCESS

● The Patient Receiving an Antiemetic or Antivertigo Drug

ASSESSMENT

Preadministration Assessment

As part of the preadministration assessment for a patient receiving a drug for nausea and vomiting, the nurse documents the number of times the patient has vomited and the approximate amount of fluid lost. Before starting therapy, the nurse takes vital signs and assesses for signs of fluid and electrolyte imbalances (see Chap. 58).

Ongoing Assessment

If vomiting is severe, the nurse observes the patient for signs and symptoms of electrolyte imbalance. The nurse monitors the blood pressure, pulse, and respiratory rate every 2 to 4 hours or as ordered by the primary health care provider. The nurse carefully measures the intake and output (urine, emesis) until vomiting ceases and the patient is able to take oral fluids in sufficient quantity. The nurse documents in the patient's chart each time the patient has an emesis. The nurse notifies the primary health care provider if there is blood in the emesis or if vomiting suddenly becomes more severe.

The nurse also may need to measure the patient's weight daily to weekly in those with prolonged and repeated episodes of vomiting (eg, those receiving chemotherapy for malignant disease).

The nurse assesses the patient at frequent intervals for the effectiveness of the drug to relieve symptoms (eg, nausea, vomiting, or vertigo). The nurse notifies the primary health care provider if the drug fails to relieve or diminish symptoms.

NURSING DIAGNOSES

Drug-specific nursing diagnoses are highlighted in the Nursing Diagnoses Checklist. Other nursing diagnoses applicable to these drugs are discussed in depth in Chapter 4.

Nursing Diagnoses Checklist

- ✓ **Risk for Fluid Volume Deficit** related to nausea and vomiting
- ✓ **Risk for Injury** related to adverse drug effects of drowsiness
- ✓ **Altered Nutrition: Less than Body Requirements** related to impaired ability to ingest and retain food and fluids

PLANNING

The expected outcomes for the patient depend on the reason the antiemetic or antivertigo drug is administered but may include an optimal response to drug therapy, management of symptoms, absence of injury, and an understanding of the drug regimen.

IMPLEMENTATION

Promoting an Optimal Response to Therapy

If the patient is unable to retain the oral form of the drug, the nurse may give it parenterally or as a rectal suppository (if the prescribed drug is available in these forms). If only the oral form has been ordered and the patient is unable to retain the drug, the nurse contacts the primary health care provider regarding an order for a parenteral or suppository form of this or another antiemetic drug.

Buclicline may be taken without water. The patient is instructed to place the tablet in the mouth and allow it to dissolve or to chew or swallow the tablet whole. When given for motion sickness, one 50-mg dose is usually effective. For more extensive travel, a second 50-mg dose may be taken after 4 to 6 hours. When administering scopolamine, one transdermal system is applied behind the ear approximately 4 hours before the antiemetic effect is needed. About 1 g of scopolamine will be administered every 24 hours for 3 days. If the disk detaches from the body, discard it and place a fresh one behind the opposite ear. (See Patient and Family Teaching Checklist: Applying Transdermal Scopolamine.)

PREVENTION OF NAUSEA IN PATIENTS WITH CANCER. Granisetron (Kytril), ondansetron (Zofran), dolasetron (Anzemet), and dronabinol (Marinol) are examples of antiemetics used to prevent nausea and vomiting after cancer (antineoplastic) chemotherapy. The nurse administers these drugs on the day the chemotherapy is given. The nurse may give granisetron and ondansetron intravenously. The nurse mixes the drug according to the manufacturer's directions and administers it about 30 minutes before administration of an antineoplastic drug. The nurse may give ondansetron orally 30 minutes before antineoplastic therapy, as well as for 1 to 2 days after, to prevent or relieve nausea and vomiting. The nurse gives dolasetron orally within 1 hour before chemotherapy. It is important to give dronabinol, which has abuse potential, orally 1 to 3 hours before administration of an antineoplastic drug, then every 2 to 4 hours after chemotherapy. These drugs have been effective in relieving or eliminating nausea and vomiting after antineoplastic therapy.

Managing Patient Symptoms

Dehydration is a serious concern in the patient experiencing nausea and vomiting. It is important to observe



Patient and Family Teaching Checklist

Applying Transdermal Scopolamine

The nurse:

- ✓ Instructs the patient to apply the transdermal scopolamine system behind the ear.
- ✓ Explains that after application of the system, the hands are washed *thoroughly* with soap and water and dried. The importance of thorough hand washing to prevent any traces of the drug from coming in contact with the eyes is emphasized.
- ✓ Teaches that the disk will last about 3 days, at which time the patient may apply another disk, if needed.
- ✓ Instructs the patient to discard the used disk and thoroughly wash and dry the hands and previous application site.
- ✓ Instructs the patient to apply the new disk behind the opposite ear and to again thoroughly wash and dry the hands.
- ✓ Emphasizes that only one disk at a time is used.
- ✓ Makes sure that the patient has a thorough knowledge of the adverse reactions that may occur with the use of this system: dizziness, dry mouth, and blurred vision.
- ✓ Stresses the importance of observing caution when driving or performing hazardous tasks.

the patient for signs of dehydration, which include poor skin turgor, dry mucous membranes, decrease in or absence of urinary output, concentrated urine, restlessness, irritability, increased respiratory rate, and confusion. If the patient is able to take and retain small amounts of oral fluids, the nurse offers sips of water at frequent intervals. In addition, it is important to observe the patient for signs of electrolyte imbalance, particularly sodium and potassium deficit (see Chap. 58). If signs of dehydration or electrolyte imbalance are noted, the nurse contacts the primary health care provider because parenteral administration of fluids or fluids with electrolytes may be necessary.



Gerontologic Alert

Observations for fluid and electrolyte disturbances are particularly important in the aged or chronically ill patient in whom severe dehydration may develop in a short time. The nurse must immediately report symptoms of dehydration, such as dry mucous membranes, decreased urinary output, concentrated urine, restlessness, or confusion in the older adult.

Nausea, vomiting, vertigo, and dizziness are disagreeable sensations. The nurse changes the patient's bedding and patient's clothing or gown as needed because the odor of vomitus may only intensify these sensations. The nurse provides the patient with an emesis basin and checks the basin at frequent intervals. If an emesis occurs, the nurse empties the basin and measures and documents the vomitus in the patient's chart. The nurse may give the patient a damp washcloth and a towel to wipe the hands and face as needed. It also is a good idea to give the patient mouthwash or frequent oral rinses to remove the disagreeable taste that accompanies vomiting.



Nursing Alert

Many of these drugs cause variable degrees of drowsiness. The nurse advises the patient to seek help when getting out of bed if drowsiness occurs.

Preventing Injury

Administration of these drugs may result in varying degrees of drowsiness. To prevent accidental falls and other injuries, the nurse assists the patient who is allowed out of bed with ambulatory activities. If extreme drowsiness is noted, the nurse instructs the patient to remain in bed and provides a call light for assistance.

Educating the Patient and Family

When an antiemetic or antivertigo drug is prescribed for outpatient use, the nurse includes the following information in a patient teaching plan:

- Avoid driving or performing other hazardous tasks when taking this drug because drowsiness may occur with use.
- Contact the primary health care provider if nausea, vomiting, or vertigo persists or worsens.
- Use only as directed. Do not increase the dose or frequency of use unless told to do so by the primary health care provider.
- Avoid the use of alcohol and other sedative-type drugs unless use has been approved by the primary health care provider.
- Take the drug about 1 hour before travel for motion sickness. Buclizine may be taken without water. Place the tablet in the mouth and allow it to dissolve or chew or swallow the tablet whole.
- Take granisetron (Kytril), dronabinol (Marinol), or ondansetron (Zofran) before antineoplastic chemotherapy (oral, intravenous) about 30 minutes before the chemotherapy treatment. Take dolasetron mesylate (Anzemet) orally at least 1 hour before

chemotherapy. After the treatment, take the prescribed antiemetic at the time recommended by the primary health care provider or printed on the drug container.

- Follow the directions for application of transdermal scopolamine that are supplied with the drug (see Patient and Family Teaching Checklist: Applying Transdermal Scopolamine).

EVALUATION

- The therapeutic effect is achieved; nausea or vertigo is controlled.
- Adverse reactions are identified, reported to the primary health care provider, and managed successfully through appropriate nursing interventions.
- No evidence of a fluid volume deficit or electrolyte imbalance is seen.
- No evidence of injury is apparent.
- The patient verbalizes the importance of complying with the prescribed treatment regimen.
- The patient or family demonstrates an understanding of the drug regimen.

● Critical Thinking Exercises

1. Ms. Davis was prescribed meclizine (Antivert-50) 50 mg for motion sickness. On return from a long car ride she tells you that the medicine did not help. Explain what questions you would ask to determine if Ms. Davis followed the prescribed drug regimen.
2. Mr. Collins is prescribed transdermal scopolamine to relieve motion sickness. Discuss the rationale you would give him to stress the importance of washing his hands after applying or removing the transdermal system.
3. Discuss the ongoing assessment needs of a patient receiving an antiemetic before chemotherapy for cancer.
4. In assessing Ms. Potter, age 52 years, in the emergency department you find that she has a decreased urinary output, concentrated urine, and poor skin turgor and is confused. She reports nausea and states she has been "vomiting all morning." Explain what is the most important information obtained from your assessment of Ms. Potter. Determine what action you would take first.

● Review Questions

1. What is the most common adverse reaction the nurse would expect in a patient receiving an antiemetic?
 - A. Occipital headache
 - B. Drowsiness
 - C. Edema
 - D. Nausea
2. When explaining how to use transdermal scopolamine the nurse tells the patient to apply the system to _____.
 - A. a nonhairy region of the chest
 - B. on the upper back
 - C. behind the ear
 - D. on the forearm
3. When an antivertigo drug is prescribed for a patient experiencing motion sickness, the nurse advises the patient to _____.
 - A. avoid driving or performing hazardous tasks
 - B. administer the drug at least 6 hours before travel
 - C. take the drug with food immediately before traveling
 - D. take the drug at the first sign of motion sickness
4. Which of these drugs is a Pregnancy Category X drug and should not be administered to a pregnant woman?
 - A. Dimenhydrinate
 - B. Scopolamine
 - C. Promethazine
 - D. Thiethylperazine

● Medication Dosage Problems

1. Ondansetron 4 mg is prescribed. The drug is available as a solution of 2 mg/mL. The nurse administers _____.
2. Diphenhydramine 50 is prescribed. The drug is available in 25-mg tablets. The nurse administers _____.
3. Compazine 2.5 mg PO is prescribed. Use the drug label below to prepare the correct dosage. The nurse would administer _____.