EVIDENCE-BASED
CARE SHEET

# Chemotherapy-Related Nausea and Vomiting

## What We Know

- Nausea and vomiting (N/V) are two of the most common, disturbing, and potentially serious side effects of chemotherapy, having physical, psychological, and emotional effects and affecting adversely the quality of life of patients with cancer[1, 2, 3, 5, 9]
  - It is thought that multiple mechanisms are involved in the physiopathology of chemotherapy-related N/V. Activation of neurotransmitters (e.g., serotonin) secondary to local gastrointestinal irritation and afferent vagal impulses that stimulate the chemoreceptor trigger zone or CT-zone and vomiting center (i.e., areas in the brainstem involved in emesis) are involved in the vomiting response. Substance P acting though neurokinin-1 receptors may also activate the CT-zone and vomiting center[1]
  - Approximately 70–80% of patients receiving chemotherapy without antiemetic experience N/V, despite advances in methods to prevent N/V[7]
  - N/V can result in dehydration, weight loss, electrolyte imbalance, and aspiration pneumonia; severe N/V can interfere with ingestion of medications for other health problems, further worsening the patient's health[2]
  - Chemotherapy-induced N/V reduces treatment adherence; in some cases, patients refuse or discontinue life-saving chemotherapy due to treatment-associated N/V[1, 3]
- The emetogenic (also called emetic; i.e., inducing vomiting) potential of chemotherapeutic agents can be classified as high (e.g., cisplatin, dacarbazine), moderate (e.g., carboplatin, doxorubicin), or low (e.g., gemcitabine, methotrexate)[3, 9]
- Commonly described types of chemotherapy-induced N/V are acute, delayed, anticipatory, breakthrough, and refractory[3, 8]
  - Acute N/V occurs during the first 24 hours after the administration of chemotherapy
  - Delayed N/V occurs more than 24 hours after the administration of chemotherapy
  - Anticipatory N/V occurs prior to a new cycle (i.e., series) of chemotherapy and is related to a previous disagreeable incident associated with chemotherapy. The patient has expectations of N/V that are provoked by sights or smells in the treatment room or by the presence of the health clinicians who administer chemotherapy. Anticipatory N/V occurs in 29% of patients receiving chemotherapy
  - Breakthrough N/V occurs after the patient has been given antiemetics to prevent N/V. The patient then needs more or a different kind of antiemetic
  - Refractory N/V occurs even though the patient has received more and different kinds of antiemetics for N/V. The antiemetics are ineffective in preventing N/V
- Risk factors
  - Risk factors for chemotherapy-induced N/V include female gender; age < 50 years; history of motion sickness–induced or pregnancy-induced vomiting; history of low alcohol consumption; high anxiety levels or depression, pain, and poorly controlled N/V during previous cycles of chemotherapy[3, 9]
  - Risk factors for anticipatory N/V include N/V after the patient's previous chemotherapy session, sweating after previous chemotherapy session, light-headedness, post-chemotherapy dizziness, generalized weakness after previous chemotherapy session, expecting nausea before beginning chemotherapy, and being on a regimen of moderately to severely emetogenic agents[8, 9]
- Pharmacologic treatment
  - A wide variety of medications, particularly antiemetics, are prescribed to prevent N/V in patients receiving chemotherapy, but not as a treatment for N/V once it has occurred. Selection of medication is based on evaluation of the emetogenic risk of the chemotherapeutic agent. Antiemetic agents may be administered orally, intravenously, intramuscularly, subcutaneously, or rectally. In general, the oral route is considered to be the easiest, is the least expensive, and is used for mild N/V and prophylaxis[3, 5, 10, 11]


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- Aprepitant, a neurokinin-1 antagonist, and palonosetron, a long-acting serotonin antagonist introduced in 2003, are two of the newer antiemetic drugs for acute and delayed N/V; in 2008, an I.V. form of aprepitant called fosaprepitant was approved by the U.S. Food and Drug Administration (FDA)[3, 5, 6]
- 5-HT3 receptor antagonists, such as dolasetron, ondansetron, granisetron, and ramosetron, are safe and effective for prevention of mild-to-moderate chemotherapy-related N/V. Granisetron is considered particularly effective for relief of N/V caused by highly emetogenic chemotherapy regimens[3, 5]
- Additional drugs used to prevent and/or treat chemotherapy-induced N/V include histamine (H1) receptor antagonists, anticholinergics, cannabinoid (CB1) receptor antagonists (e.g., tetrahydrocannabinol), dopamine (D2) receptor antagonists (e.g., phenothiazines), corticosteroids (e.g., dexamethasone), and benzodiazepines (e.g., lorazepam)[3, 5]
- Research suggests that antiemetic medications used in combination tend to be more effective than any single agent when moderately to highly emetogenic chemotherapeutic agents are being administered[5]
  – A combination of a phenothiazine (prochlorperazine) and 5-HT3 receptor antagonists effectively reduces breakthrough chemotherapy-related N/V[4]

- Nonpharmacologic treatment
  - Researchers have suggested that behavioral therapy, hypnosis, guided imagery, systemic desensitization, acupressure, and progressive muscle relaxation techniques are the most effective nonpharmacologic management treatments for anticipatory N/V[10]
  - A systematic review of 6 randomized controlled trials found that hypnosis combined with pharmacologic treatment was more effective than pharmacologic treatment alone for reducing chemotherapy-induced N/V[7]

## What We Can Do

- Learn about chemotherapy-induced N/V so that you can accurately assess your patients' personal characteristics, anticipate episodes, assist with effective management, and educate your patients receiving chemotherapy. Share this knowledge with colleagues
- Carefully assess your patient's potential for chemotherapy-induced N/V; be aware of the patient's risk factors for N/V and consider the presence of "triggers" (e.g., smells, positions, tastes) that may induce N/V[3, 8]
- Remove objects or environmental elements that may precipitate or contribute to the development of anticipatory N/V
- Administer antiemetic medications, as prescribed, prior to chemotherapy treatments; educate patients and/or their families about prescribed medications and other interventions that may be helpful in relieving chemotherapy-induced N/V[1, 5, 6]
- Telephone the patient after administration of chemotherapy to ask if any N/V was experienced and/or any objectionable side effects; encourage the patient to maintain a diary of side effects[8]
- Advise the patient to eat a light meal or snack before receiving each chemotherapy treatment, and avoid fatty foods
- Advise the patient to eat foods high in carbohydrates; eat small, frequent meals; and eat foods at room temperature or cold to reduce food triggers (e.g., smelling food odors)
- Request referral to a mental health clinician/behavioral therapist and/or alternative medicine specialist, as necessary, for additional management techniques

## Coding Matrix

*References are rated in order of strength:*

**M** Published meta-analysis
**SR** Published systematic or integrative literature review
**RCT** Published research (randomized controlled trial)
**R** Published research (**not** randomized controlled trial)
**C** Case histories, case studies
**G** Published guidelines
**RV** Published review of the literature
**RU** Published research utilization report
**QI** Published quality improvement report
**L** Legislation
**PGR** Published government report
**PFR** Published funded report
**PP** Policies, procedures, protocols
**X** Practice exemplars, stories, opinions
**GI** General or background information/texts/reports
**U** Unpublished research, reviews, poster presentations or other such materials
**CP** Conference proceedings, abstracts, presentations

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