CHEMOTHERAPY-INDUCED NAUSEA & VOMITING (CINV)

quick reference guide

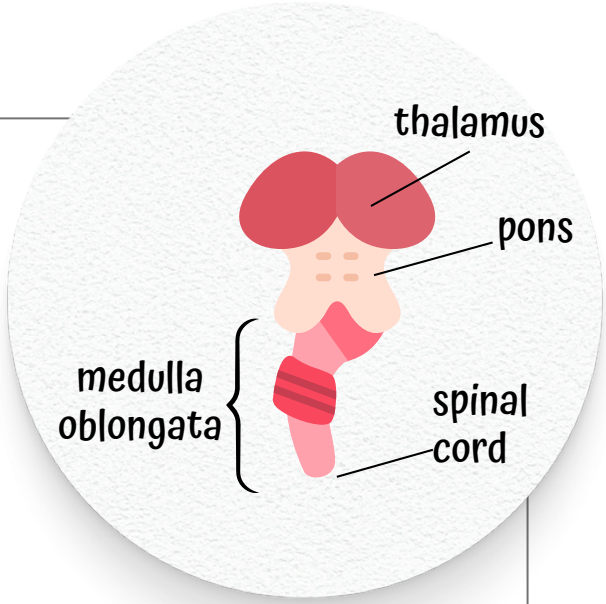
Peachtree RN

RESOURCES FOR ONCOLOGY NURSES

PATHOPHYSIOLOGY OF CHEMO-INDUCED NAUSEA & VOMITING (CINV)

CENTRAL PATTERN GENERATOR (AKA VOMITING CENTER OR VC)

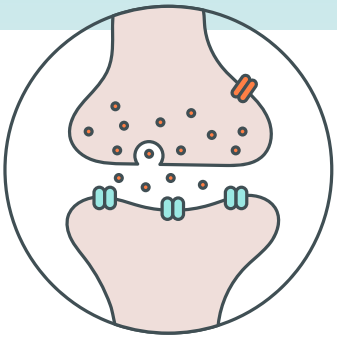
- Vomiting reflex is controlled by the brain, in the medulla oblongata
- Signals come via multiple pathways (peripheral & central)
  - Chemoreceptor trigger zone
  - Pharynx & GI tract (via vagus nerve)
  - Cerebral cortex
- Once triggered, VC sends signals to salivation center, abdominal muscles, respiratory system, & cranial nerves to induce vomiting reflex
- More than 30 neurotransmitters linked to CINV
- Chemo & other tx can activate these receptors, leading to N&V



PRIMARY RECEPTORS

- 5-HT3 (serotonin)
- Neurokinin (NK) 1
- Dopamine
- Histamine
- Acetylcholine
- Cannabinoid
- Opioid
- Corticosteroid

- Antiemetics work by blocking different receptors
- However, most antiemetics only block 1 receptor, which is why more than one type of antiemetic may be used
- Only olanzapine blocks multiple receptors



CHEMO-INDUCED N&V

CINV is one of the most dreaded & distressful side effects of cancer treatment, particularly chemotherapy

Classified by how many people typically experience N&V

- Minimal emetic risk = Less than 10%
- Low emetic risk = 10-30%
- Medium emetic risk = 30-90%
- High emetic risk = Over 90%

HIGH RISK OF CINV

- carboplatin
- HD carmustine
- cisplatin
- HD cyclophosphamide
- dacarbazine
- HD doxorubicin Adriamycin
- HD epirubicin (Ellence)
- HD ifosfamide
- mechlorethamine
- HD melphalan
- sacituzimab govitecan-hziy (Trodelvy)
- streptozocin (Zanosar)

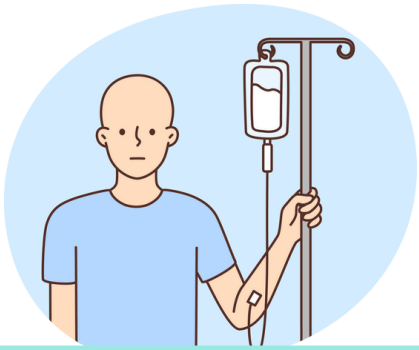
TYPES OF CINV

Acute N&V	• Occurs within minutes to hours • Usually ends within 1st 24hr • Linked to type, dose, administration, & patient risk factors
Delayed N&V	• Occurs more than 24 hours after treatment • Common with treatments that have a high risk of causing vomiting
Anticipatory N&V	• Occurs prior to the next cancer treatment & most often related to a prior experience • Can be triggered by smells, sounds, sights related to treatment
Breakthrough N&V	• Occurs despite preventative antiemetics
Refractory N&V	• Continues with each treatment cycle • CINV not able to be controlled despite various antiemetics

COMMONLY USED ANTIEMETICS

Drug Name	Drug Class	Mechanism of Action	Indications	Side Effects
Ondansetron	5-HT3 Receptor Antagonist	Blocks serotonin at the 5-HT3 receptors in the gut and CNS	Chemo-induced nausea & vomiting	Headache, constipation, QT prolongation
Aprepitant	NK-1 Receptor Antagonist	Inhibits neurokinin-1 (NK-1) receptor to block substance P	Acute and delayed CINV	Fatigue, hiccups, dizziness
Metoclopramide	Dopamine (D2) Antagonist	Blocks dopamine receptors; enhances gastric emptying	CINV, delayed gastric emptying	Drowsiness, extrapyramidal symptoms (EPS)
Prochlorperazine	Phenothiazine (D2 Antagonist)	Blocks dopamine receptors in the CNS	CINV, breakthrough nausea & vomiting	Sedation, EPS, hypotension
Dexamethasone	Corticosteroid	Reduces inflammation and prostaglandin production	CINV (as an adjunct)	Hyperglycemia, insomnia, mood changes
Lorazepam	Benzodiazepine	Reduces anxiety and has sedative effects	Anticipatory nausea & vomiting	Sedation, confusion, respiratory depression
Olanzapine	Atypical antipsychotic	Blocks serotonin, dopamine, histamine & acetylcholine	CINV (as an adjunct)	Anticholinergic s&s, postural hypotension, sedation

CINV PATIENT & CAREGIVER EDUCATION



TIPS FOR PATIENTS WITH CINV

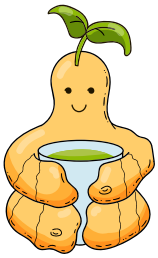
- Drink fluids! Try broth, Pedialyte or electrolyte supplement, ginger ale, peppermint tea, etc. Sip throughout the day, instead of trying to chug a lot at once.
- Some people like chewing on ice chips or popsicles to increase fluid intake
- Eat small amounts whenever you feel hungry throughout the day instead of attempting to eat 2-3 larger meals
- Avoid very spicy or acidic foods that can be irritating to the stomach
- Avoid smells that can make N/V worse (food or otherwise)
- If/when you aren't eating much, try to choose food/drink higher in calories & protein to maintain muscle strength & support recovery

PT ED RESOURCES

- NCCN Guidelines for Patients | Nausea & Vomiting
- What to Do for Nausea & Vomiting | American Cancer Society

Complementary & Integrative Interventions for CINV

- Progressive muscle relaxation (PMR)
- Guided imagery
- Ginger
- Aromatherapy & peppermint
- Acupuncture
- Music therapy
- Meditation



While each person is unique, patients may want to AVOID their favorite foods when they're feeling sick, so they don't form a negative association to those foods in the future

But for others, these might be the only tolerable foods! Do what works best for your situation.

NCCN ANTIEMETIC GUIDELINES FOR MULTIDAY CHEMO REGIMENS

ANTIEMETIC DRUG	NCCN GUIDELINES FOR MULTIDAY REGIMENS	NOTES
CORTICOSTEROIDS	• Dexamethasone should be given once/day for moderately emetogenic chemotherapy (MEC) or highly emetogenic chemotherapy (HEC), then given once/day for 2-3 days after chemo for regimens associated with delayed N/V • Steroid can be modified if regimen already includes a corticosteroid	• Can increase serum glucose; use with caution in patients with diabetes • Can cause dyspepsia; take with food and/or consider adding H2 blocker or PPI • Can cause hiccups • If patient can't tolerate dexamethasone, consider replacing with olanzapine • Consider extending course of dex for patients with extended-delayed CINV
SEROTONIN RECEPTOR ANTAGONISTS (5-HT3 RA)	• A 5-HT3 RA should be given before every dose of MEC or HEC • Frequency for additional doses depends on the drug used and route of administration	• FDA recommends single dose of IV ondansetron is no more than 16 mg to prevent QT interval prolongation • Most common side effects of 5-HT3 RAs are headaches and constipation • Non-sedating • Best effects of 5-HT3 RAs seen with scheduled admin, not PRN
NEUROKININ-1 RECEPTOR ANTAGONISTS (NK1 RA)	• NK1 RAs may be given for multi-day regimens that are MEC or HEC and associated with significant delayed N/V	• Aprepitant, aprepitant injectable emulsion, fosaprepitant, netupitant, and fosnetupitant inhibit dexamethasone metabolism (increased dexamethasone serum levels when given concomitantly) • Indicated for prevention of CINV (especially delayed CINV), **not** treatment of CINV
ATYPICAL ANTIPSYCHOTICS	• If olanzapine used to prevent N/V, can give once/day (before chemo OR at bedtime), & continued for 2-3 days after chemo for regimens associated with significant delayed N/V	• Monitor for dystonic reactions • Monitor for QT prolongation • Can cause CNS depression; use with caution or lower dose for patients at higher risk for falls • Unless given as a premed for chemo, administer at bedtime

NCCN GUIDELINES ON ANTIEMETICS

- Premeds vary by institution, but many use the NCCN Guidelines as a reference
- NCCN notes that premeds might need modifications based on unique factors, drug availability, patient preferences, etc.

NCCN GUIDELINES ARE FREE TO EVERYONE WITH A LOGIN AND A GREAT RESOURCE!

nccn guidelines

NCCN RECOMMENDS PREMEDS FOR PREVENTION OF CINV BASED ON EMETOGENICITY (HOW LIKELY IT IS TO CAUSE N/V):

- HIGH EMETIC RISK = >90% PEOPLE HAVE EMESIS
- MODERATE EMETIC RISK = 30-90%
- LOW EMETIC RISK = 10-30%
- MINIMAL EMETIC RISK = <10%

THEY ALSO MAKE DIFFERENT RECOMMENDATIONS FOR IV VERSUS PO CANCER TREATMENTS

HIGH EMETIC RISK (>90%)

NCCN preferred antiemetic regimen for highly emetogenic anticancer therapies includes:

olanzapine + NK1 receptor antagonist + 5-Ht3 receptor antagonist

START ON DAY 1 PRIOR TO 1ST ANTICANCER TREATMENT

- OLANZAPINE 5-10 MG PO ONCE

CHOOSE 1 OF THE FOLLOWING NK1 RECEPTOR ANTAGONISTS:

- Aprepitant 125 mg PO once
- Aprepitant injectable emulsion 130 mg IV once
- Fosaprepitant 150 mg IV once
- Netupitant 300 mg/ palonosetron 0.5 mg (combination drug) PO once
- Fosnetupitant 235 mg/ palonosetron 0.25 mg (combination drug) IV once
- Rolapitant 180 mg PO once

CHOOSE 1 OF THE FOLLOWING 5-HT3 RECEPTOR ANTAGONISTS:

- Dolasetron 100 mg PO once
- Granisetron 10 mg subQ once; or 2 mg PO once; or 0.1mg/kg (max 1mg) IV once; or 3.1 mg/24-h transdermal patch 24-48 h before 1st dose of anticancer treatment)
- Ondansetron 16-24 mg PO once; or 8-16 mg IV once
- Palonosetron 12 mg PO/IV once
- Dexamethasone 12 mg PO/IV once

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