Nausea in the palliative patient

Christian La Rivière, MD, FRCPC
Palliative Care Consultant
Emergency Medicine Specialist
January 23, 2009
Objectives

♦ Discuss common causes for nausea and vomiting
♦ Identify the areas of the body and receptors involved that stimulate nausea and vomiting
♦ Select medications to help control nausea and vomiting
♦ Differentiate approaches to managing nausea and vomiting using the above
Incidence

- Nausea: 50-60%
- Vomiting: 30%
Causes

- Metastases
- Meningeal irritation
- Movement
- Mental anxiety
- Medications

- Mechanical Obstruction
- Motility
- Metabolic
- Microbial
Chemoreceptor Trigger Zone (CTZ)

Vomiting center

Cortex

Vestibular apparatus

Neurotransmitters
- Serotonin
- Dopamine
- Acetylcholine
- Histamine

GI tract
Neurophysiology of Nausea/Vomiting

Cerebral Cortex

Chemoreceptor Trigger Zone

Vagus

Vestibular Centre

GI Tract

Vomiting Centre

Emesis
Integrative Vomiting Centre (IVC)

Cerebral High CNS
- Sights, Smells
- Memories

Vestibular
- Opioids
- Cerebellar Tumor

Increased Intracranial Press
- Primary or Met. Tumor

Chemoreceptor Trigger Zone
- Toxic
  - Ca Emetogenic
  - Infection
  - Radiation
- Drugs
  - Chemotherapy
- Opioids
- Digoxin, etc
- Biochemical
  - Uremia
  - Hypercalcemia

GI Tract Vagal
- Distension
  - Over-eating
  - Gastric Stasis
  - Extrinsic Press.
- Obstruction
  - High, mid, low
  - Constipation
  - Chemical Irritants
  - Blood, drugs

G. Michael Downing
Receptors

- Acetylcholine (AchM)
- Histamine (H1)
- Dopamine (D2)
- Serotonin (5-HT3)
- GABA
- THC
- Neurokinin (NK)
Vestibular
(H1 AchM)

- Movements
- CTZ
- Opioids
Chemoreceptor Trigger Zone
(5-HT3, D2, NK and more)

- Toxins
- Metabolites
- Tumour Factors
- Vestibular System
- Drugs
- Vagus
Cerebral Cortex
(GABA 5-HT3)

- Meningeal irritation
- ICP
- ↓Na+, ↑Ca2+
- Opioids
- Pain
- Past experiences
- Anxiety/Fear
- Tastes/smells
Vagus
(5-HT3  NK  AchM)

- Mechanoreceptors
- Chemoreceptors
- Hepatic Chemoreceptors
GI Tract
(D2 5-HT3 AchM)

- Drugs
- Obstruction
- Other Medical Conditions
Neurophysiology of Nausea / Vomiting

Cerebral Cortex
GABA  5-HT₃

Vagus
5-HT₃  NK₁  ?AchM

GI Tract
D2  5-HT₃  Achm

Chemoreceptor Trigger Zone
5-HT₃  D2  NK₁  More

Vestibular Centre
H1  Achm

Vomiting Centre
Achm  H1  5-HT₃  NK₁  More

Emesis

C. Woelk
Integrative Vomiting Centre (IVC)

**Chemoreceptor Trigger Zone**
- Toxic
  - Ca Emetogenic
  - Infection
  - Radiation
- Drugs
  - Chemotherapy
  - Opioids
  - Digoxin, etc
- Biochemical
  - Uremia
  - Hypercalcemia

**Vestibular**
- Opioids
- Cerebellar Tumor

**Increased Intracranial Press**
- Primary or Met. Tumor

**Cerebral High CNS**
- Sights, Smells
- Memories

**GI Tract Vagal**
- Distension
  - Over-eating
  - Gastric Stasis
  - Extrinsic Press.
- Obstruction
  - High, mid, low
  - Constipation
- Chemical Irritants
  - Blood, drugs

G. Michael Downing
Medications

- Dopamine antagonists
- H1 antagonists (antihistaminics)
- Serotonin antagonists
- Antimuscarinic (anticholinergics)
- Others
Dopamine antagonists

- Metoclopramide (Maxeran)
  - 10 mg po q4h
- Domperidone
  - 10 mg po q4h
- Prochlorperazine (Stemetil)
  - 10 mg po q4h
- Haldol
- Methotrimeprazine (Nozinan)
H1 antagonist

- Dimenhydrinate (Gravol)
  - 25-50mg po q4h
- Promethazine (Phenergan)
  - 25 mg po q4h
Serotonin antagonists

- Ondansetron (Zofran)
  - 4-8mg po bid
- Granisetron (Kytril)
  - 1 mg po bid
Antimuscarinic

- Scopolamine
  - Transderm-V patch q3days
Others

- Nabilone
- Dronabinol
- Dexamethasone
- Lorazepam
Integrative Vomiting Centre (IVC)

Cerebral High CNS
- Benzodiazepines
- Nabilone, THC
- Relaxation

Vestibular
- \( H_1 \) Antagonist
  - Dimenhydrinate
  - Methotrimeprazine
- Anticholinergic
  - Scopolamine
  - Atropine

Increased Intracranial Press
- Dexamethasone
- ? VP Shunt

Chemoreceptor Trigger Zone
- \( D_2 \) Antagonist
- Prochlorperazine
- Haloperidol
- Methotrimeprazine
- Chlorpromazine
- Gastrokinetics
- Metoclopramide
- Domeperidone
- \( 5HT_3 \) Antagonist
- Granisetron

GI Tract Vagal
- \( D_2 \) Antagonist
- Gastrokinetics
- Metoclopramide
- Domeperidone
- Phenothiazines
- Methotrimeprazine
- \( 5HT_4 \) Agonist
- Cisapride
- Metoclopramide
- \( 5HT_3 \) Antagonist
- Granisetron
- Metoclopramide
- Octreotide
- Dexamethasone

G. Michael Downing
Integrative Vomiting Centre (IVC)

**Cerebral High CNS**
- Benzodiazepines
- Relaxation

**Vestibular**
- H1 Antagonist
  - Dimenhydrinate
- Anticholinergic
  - Scopolamine

**Increased Intracranial Press**
- Dexamethasone

**Chemoreceptor Trigger Zone**
- D2 Antagonist
  - Prochlorperazine

- Gastrokinetics
- Metoclopramide
- Domeperidone
- 5HT3 Antagonist
  - Granisetron

**GI Tract Vagal**
- D2 Antagonist
- Gastrokinetics
- Metoclopramide
- Domeperidone
- 5HT4 Agonist
- Metoclopramide
- 5HT3 Antagonist
  - Granisetron
  - Metoclopramide

G. Michael Downing
Principles of treating nausea and vomiting

- Treat the cause if possible
- Environmental measures
- Antiemetic use
  - Anticipate need if possible
  - Aim at presumed receptor.s involved
  - Use adequate, regular doses
  - Combinations if necessary
  - Anticipate need for alternate routes
Questions?