AMERICAN COLLEGE OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

Antiemetics

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ACOEM acknowledges the following organizations and their representatives who served as reviewers of the "Hip and Groin Disorders" Guideline from which this guidance for antiemetics was extracted. Their contributions are greatly appreciated. By listing the following individuals or organizations, it does not infer that these individuals or organizations support or endorse the treatment guidelines developed by ACOEM.

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Introduction

Nausea and vomiting are common complications of anesthesia. Other sources of nausea include:

- Visceral pain,
- Severe headaches,
- Traumatic brain injury,
- Eye pain,
- Heart attack,
- Infections,
- Food poisoning,
- Adverse effects of medications,
- Motion sickness,
- Severe anxiety, and
- Severe pain.

A wide variety of antiemetic agents are administered by various routes to prevent and treat peri-operative and other nausea and vomiting [1-9], including:

- Serotonin receptor antagonists (5HT3 and H1) [7],
- Dopamine receptor antagonists,
- Substance P antagonists [10],
- Antihistamines, and
- Anticholinergics [11].

Uncommonly used agents have included:

- Dexamethasone [12],
- Anticonvulsants [13-20],
- Dimenhydrinate [5], and
- Neurokinin-1 receptor antagonists [21].

The specific antiemetic agents most commonly used are reportedly:

- Droperidol,
- Metoclopramide [2], and
- Ondansetron [9].

Some prior systematic reviews have suggested no clear superiority of any single antiemetic [8, 14].

Treatment Recommendation

Antiemetics

Recommended.

Antiemetics are moderately recommended for peri-operative nausea and vomiting and in cases of severe pain causing nausea and vomiting.

Strength of Evidence – **Moderately Recommended, Evidence (B)**

Level of Confidence – High

Indications:	Pre-, peri- and post-operative nausea and emesis. Often used prophylactically either pre-operatively or at the end of the operative procedure when emesis is potentially anticipated and/or has significant impacts on the type of surgical procedure/wound. Also, may be provided post-operatively where there is ongoing nausea and/or vomiting either present or anticipated to potentially occur. In infrequent cases, severe pain without surgery may be associated with nausea and warrant treatment.
Benefits:	Reduced, prevented, or resolved nausea and vomiting
Harms:	Adverse effects vary based on type of medication. Common adverse effects include drowsiness, dry mouth, urinary retention, blurred vision, sedation, tremor.
Frequency/Dose/Duration:	Per manufacturer recommendation. Most studies administered intraveneous (I.V.) medication at close of surgery with some studies administering medication immediately pre-operatively. Routes used besides I.V. have included oral, PCA pump, and intramuscular. The rectal route is used typically as a tertiary strategy after common routes and/or combinations of medications have failed, although supportive quality studies were not found for rectal (PR) administration. Medications and doses used in quality studies include (most given I.V.):

a. Aprepitant 40, 80, 125mg and 40mg P.O.
b. Cyclizine 50mg
c. Dimenhydrinate 50mg and 1mg/kg
d. Dolasetron mesylate 12.5, 25, 50, 100 mg
e. Droperidol 0.625, 1.25, 2.5, 5, 10, 15, 50mg and 0.014 micrograms/kg
f. Granisetron 0.1, 1, 3mg and 20, 40 micrograms/kg
g. Metoclopramide 10,20mg and 0.25mg/kg and 10mg P.O.
h. Ondansetron 1, 2, 4, 8mg and 100 micrograms/kg and 4, 8mg P.O.
i. Palonosetron 0.025, 0.05, 0.075mg
j. Perphenazine 5mg
k. Prochlorperazine 0.1,10mg
l. Ramosetron 0.15, 0.3, 0.6mg and 4 micrograms/kg and 0.1mg P.O.
m. Rolapitant 20, 70, 200mg
n. Tropisetron 2.5mg and 0.1mg/kg

	Various combinations of agents have been used and generally suggest superiority of multiple agents over single agent approaches, thus providing potential tertiary treatment strategies for more difficult cases. Quality evidence supports combinations including Dolasetron and Droperidol; Droperidol and Ondansetron, and Dimenhydrinate and Droperidol [2].
Indications for Discontinuation:	Resolution of symptoms
Rationale:	There are multiple anti-emetic agents with demonstrated efficacy, although not all studies report efficacy. Anti-emetic agents are either non-invasive or minimally invasive depending on administration route, have low adverse effects, are mostly low cost, have demonstrated efficacy and are thus recommended.
Evidence:	A comprehensive literature search was conducted using PubMed, Scopus, CINAHL, Cochrane Library, and Google Scholar without date limits using the following terms: Antiemetics, Antiemetic Agents; Hip Osteoarthritis, Hip Degenerative Joint Disease, Hip Osteoarthrosis, Hip Degenerative Arthritis; controlled clinical trial, controlled trials, randomized controlled trial, randomized controlled trials, random allocation, random*, randomized, randomization, randomly; systematic, systematic review, retrospective, and prospective studies. We found and reviewed 1119 articles in PubMed, 279 in Scopus, 14 in CINAHL, 38 in Cochrane Library, 497 in Google Scholar (Went through first 100), and 50 from other sources. We considered for inclusion 36 from PubMed, 0 from Scopus, 0 from CINAHL, 0 from Cochrane Library, 0 from Google Scholar, and 83 from other sources. Of the 119 articles considered for inclusion, 86 were randomized controlled trials and 33 systematics reviews.

Guideline/Condition Applicability

Ankle and Foot Disorders

Achilles Bursitis or Tendinopathy
Achilles Tendon Rupture
Bunion
Charcot Arthropathy
Chronic Ulcer, Lower Limb (Including Toes, Foot, Ankle, Calf)
Fracture, Ankle
Fracture, Calcaneus
Fracture, Forefoot (Sesamoid, Phalanges)
Fracture, Metatarsal Bones
Fracture, Midfoot (Cuboid, Cuneiform, Navicular)
Fracture, Talus
Fracture, Tibia or Fibula
Hammertoe
Morton Neuroma
Paronychia

Plantar Fasciitis
Sprains and Strains, Ankle
Tarsal Tunnel Syndrome

Cervical and Thoracic Spine Disorders

Cervical Disc Disorder with Myelopathy
Fracture, Cervical Spine (Without Spinal Cord Injury)
Myelopathy
Neck Pain
Radicular Pain Syndrome, Cervical Spine
Sprains and Strains, Cervical Spine (Neck)
Thoracic Spine Pain

Chronic Pain

Chronic Neuropathic Pain
Complex Regional Pain Syndrome
Pain, Chronic

Elbow Disorders

Biceps Tendinitis
Dislocation, Elbow
Epicondylitis, Medial and Lateral
Fracture, Humerus, Distal
Fracture, Humerus, Proximal
Fracture, Radius, Proximal
Neuropathy of Radial Nerve (Entrapment)
Neuropathy of Ulnar Nerve (Entrapment)
Olecranon Bursitis
Osteoarthrosis, Elbow
Osteonecrosis, Elbow
Pronator Syndrome
Sprains and Strains, Elbow

Eye Disorders

Foreign Body, Cornea
Pterygium

Hand, Wrist, and Forearm Disorders

Carpal Tunnel Syndrome
Compartment Syndrome
Crush Injury
Dupuytren's Contracture
Fracture, Carpal Bones
Fracture, Fingers and Thumb
Fracture, Metacarpal Bones
Fracture, Radius and Ulna, Distal

Kienböck's Disease
Laceration, Upper Extremity
Osteoarthrosis, Hand and Finger
Pain in Limb
Puncture Wound
Sprains and Strains, Hand or Fingers
Sprains and Strains, Wrist
Synovial Cyst
Tenosynovitis
Tenosynovitis, Radial Styloid
Triangular Fibrocartilage Complex (TFCC) Tears
Trigger Finger or Thumb

Hip and Groin Disorders

Epididymitis
Femoral Acetabular Impingement
Fracture, Femoral Neck
Gluteus Medius Tear
Greater Trochanteric Pain Syndrome
Groin Pain, Adductor-Related
Groin Strain
Hip Dysplasia
Labral Tear, Hip
Ligamentum Teres Rupture
Meralgia Paresthetica
Orchitis
Osteoarthrosis, Hip
Osteonecrosis, Hip
Pain, Hip
Sciatica
Strains, Hamstring
Strains, Hip Flexor
Strains, Lower Abdominal
Tendinosis, Gluteus Medius

Knee Disorders

Iliotibial Band Syndrome
Meniscus Disorders, Knee
Osteoarthrosis, Knee
Osteonecrosis, Knee
Pain, Knee
Patellar Tendinopathy
Patellofemoral Joint Syndrome

Sprains and Strains, Knee
Strains, Quadriceps and Calf

Low Back Disorders

Ankylosing Spondylitis
Facet Degenerative Joint Disease
Fracture, Lumbosacral Spine (Without Spinal Cord Injury)
Fracture, Vertebra
Low Back Pain
Radicular Pain Syndrome, Lumbar Spine
Spinal Stenosis
Spondylolisthesis

Opioids

Opioid use may cause nausea and vomiting

Shoulder Disorders

Adhesive Capsulitis of Shoulder
Brachial Plexus Injuries
Calcific Tendinitis, Shoulder
Dislocation, Acromioclavicular Joint
Dislocation, Glenohumeral
Fracture, Clavicle
Impingement Syndrome
Labral Tear, Shoulder
Osteoarthrosis, Shoulder
Osteonecrosis, Shoulder
Pain, Shoulder
Rotator Cuff Syndrome
Rotator Cuff Tear
Sprains and Strains, Shoulder and Upper Arm
Thoracic Outlet Syndrome

Traumatic Brain Injury

Fracture, Skull (Closed)
Headache
Traumatic Brain Injury

Workplace Mental Health

Posttraumatic Stress Disorder

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