Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

Note: The information provided here applies to standard doses of chemotherapy not requiring stem cell rescue.

RISK ASSESSMENT

Assess for level of patient risk:
- Young age
- Female
- Non-alcohol drinker
- Contraindication to steroids
- History of motion sickness
- Those previously failing conventional antiemetic therapy
- Nausea/vomiting with prior chemotherapy/biotherapy
- History of emesis during pregnancy or hyperemesis gravidarum
- History of anticipatory nausea

Note: These characteristics represent increased risk for CINV; closer monitoring and more frequent reassessment recommended

→ Determine emetogenicity of chemotherapy/ biotherapy (see Appendix A)

→ Is patient currently nauseated or have anticipatory nausea/vomiting?

PREVENTION/PROPHYLAXIS OF ANTICIPATORY NAUSEA/VOMITING

Yes →

Pharmacologic interventions:
- Alprazolam 0.5 – 1 mg PO prior to chemotherapy **or**
- Lorazepam 0.5 – 1 mg IV or PO prior to chemotherapy

Behavioral therapy:
- Consider referral to Integrative Medicine
- Relaxation techniques/exercises
- Hypnosis
- Systematic desensitization
- Cognitive distraction
- Yoga
- Music therapy
- Acupuncture/acupressure[1]

No →

Prevention of CINV at initiation of chemotherapy →

- For IV chemotherapy regimens, see Pages 2 and Page 3
- For Oral chemotherapy regimens, see Page 4

Note: For IV/PO combination chemotherapy, use highest emetogenic agent to determine antiemetics

[1] Not recommended for patients with INR > 2, platelets < 25 K/uL, and/or absolute neutrophil count (ANC) < 1 K/uL

Department of Clinical Effectiveness V9
Approved by The Executive Committee of the Medical Staff on 09/17/2024

Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

IV CHEMOTHERAPY HIGH AND MODERATE EMETOGENIC RISK[1]

PREVENTION/PROPHYLAXIS

Prevention of CINV HEC and MEC[2,3]

HEC

See Appendix C, Page 12 for regimen details
- Olanzapine
- Serotonin antagonist (5-HT3 RA)[4]
- Steroids[5,6]
- Neurokinin-1 antagonist (NK1 RA)[7]

HEC or MEC

See Appendix C, Page 13 for regimen details
- Olanzapine
- 5-HT3 RA[4]
- Steroids[5,6]

See Appendix C, Page 14 for regimen details
- 5-HT3 RA[4]
- NK1 RA[7]
- Steroids[5,6]

MEC

See Appendix C, Page 15 for regimen details
- 5-HT3 RA[4]
- Steroids[5,6]

Last day of chemotherapy cycle?

Yes → For subsequent cycles, see Page 6

No → Refer to beginning for each day of chemotherapy within the same cycle (see specific antiemetic regimens)

If at any time patient experiences breakthrough nausea or vomiting, see Page 5 for management

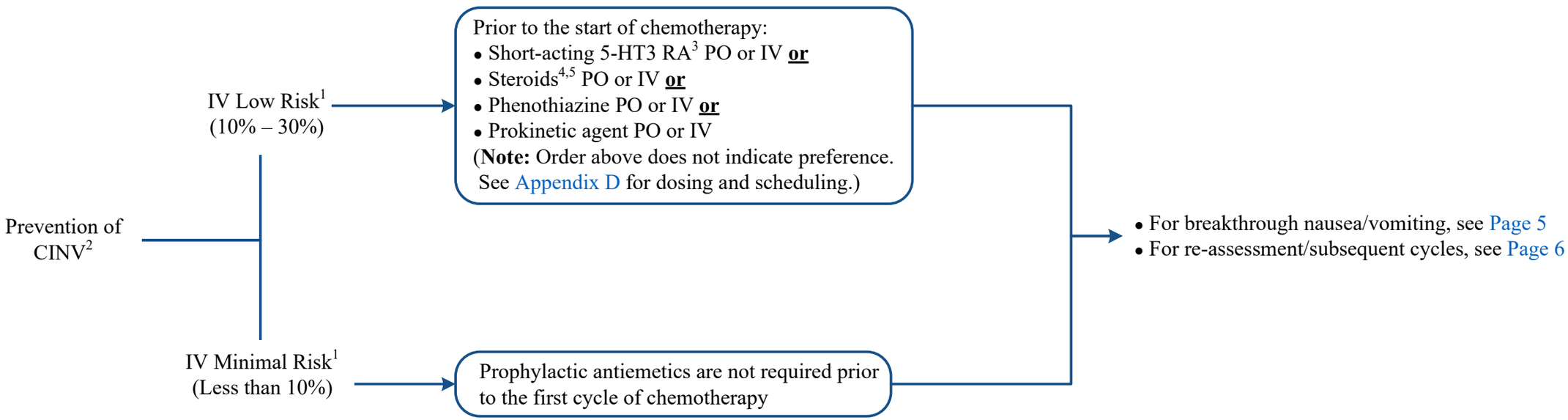
HEC = Highly Emetogenic Chemotherapy
MEC = Moderately Emetogenic Chemotherapy

[1] See Appendix A for Emetogenic Potential of Chemotherapy/Biotherapy Agents
[2] Assess need for histamine H_2 antagonist or proton pump inhibitor (PPI) for dyspepsia
[3] See Appendix B for multi-day chemotherapy antiemetic suggestions
[4] All 5-HT3 RAs are considered therapeutically equivalent when dosed appropriately; see Appendix D (ondansetron preferred)
[5] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen: a) risk of immunosuppression; b) avoid duplicative therapy (may already be part of chemotherapy regimen); c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.
[6] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for more detail and other safety considerations.
[7] May interact with cytochrome P450 enzyme (CYP enzyme); check for drug interactions – see Appendix D

Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

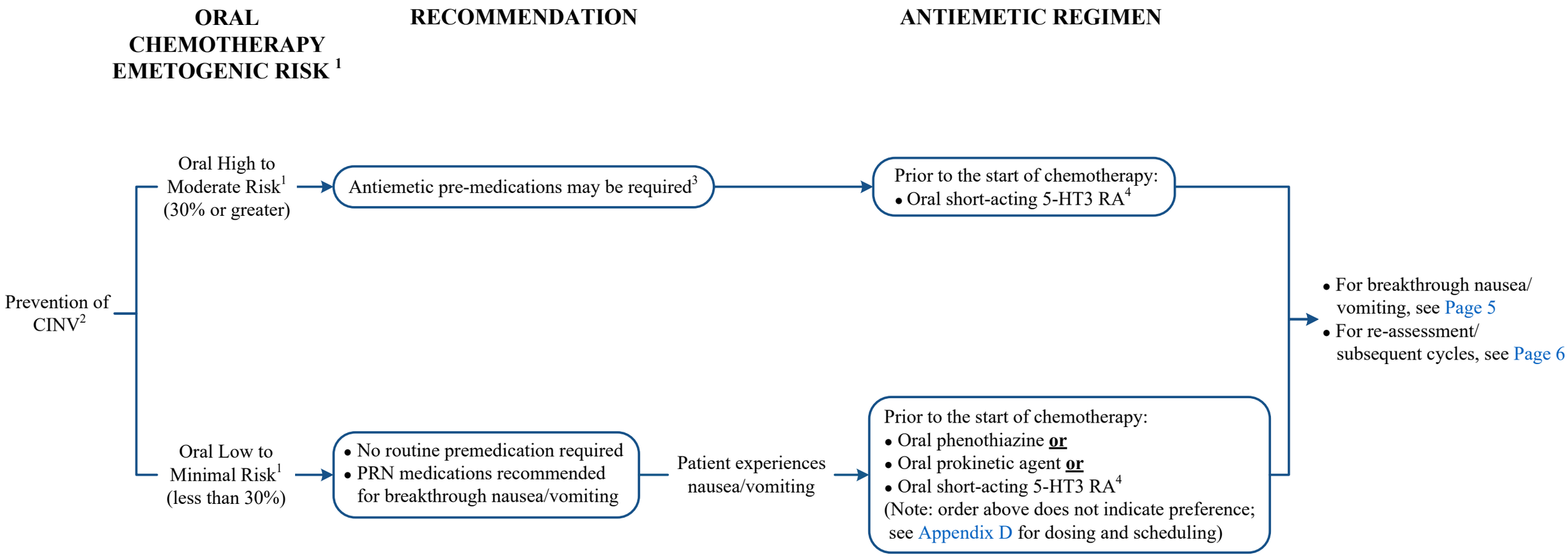
IV CHEMOTHERAPY LOW AND MINIMAL EMETOGENIC RISK[1]

PREVENTION/PROPHYLAXIS



[1] See Appendix A for Emetogenic Potential of Chemotherapy/Biotherapy Agents
[2] Assess need for histamine H_2 antagonist or proton pump inhibitor (PPI) for dyspepsia
[3] All 5-HT3 RAs are considered therapeutically equivalent when dosed appropriately, see Appendix D (ondansetron preferred)
[4] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen: a) risk of immunosuppression; b) avoid duplicative therapy, may already be part of chemotherapy regimen; c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.
[5] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for more detail and other safety considerations.

Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

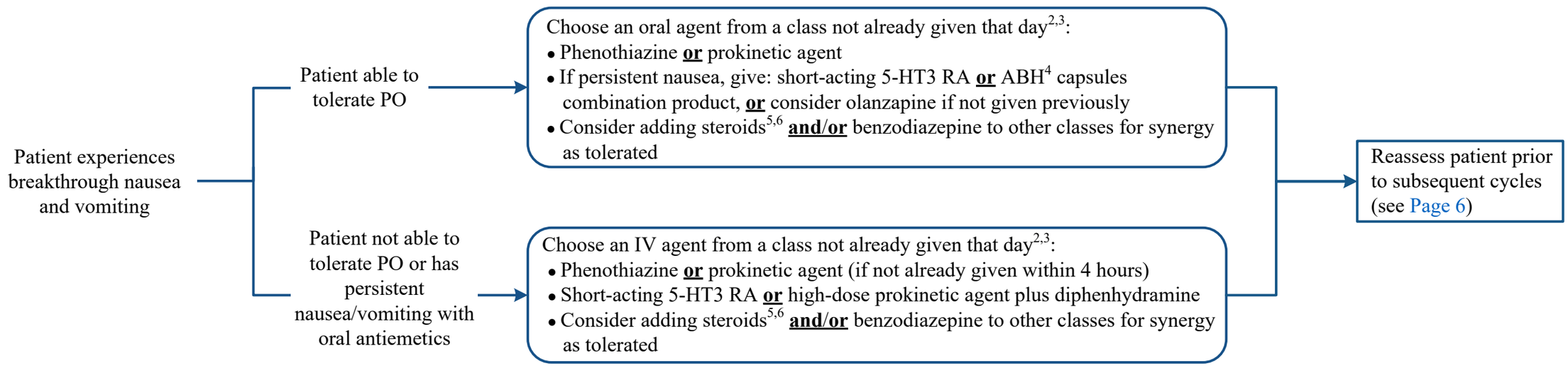


[1] See Appendix A for Emetogenic Potential of Chemotherapy/Biotherapy Agents
[2] Assess need for histamine H_2 antagonist or proton pump inhibitor (PPI) for dyspepsia
[3] Oral continuous dosing of chemotherapy/biotherapy for prolonged periods of time presents an emetogenic classification challenge as the emetogenic risk is likely overestimated in the product information. Therefore, an individualized approach is recommended and utilizing as needed antiemetics instead of routine premedication is often sufficient.[2]
[4] All 5-HT3 RA are considered therapeutically equivalent when dosed appropriately, see Appendix D (ondansetron preferred)

Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

BREAKTHROUGH NAUSEA AND VOMITING

General principles:
- 5-HT3 RA and NK1 RA are generally not effective or approved for the treatment of breakthrough nausea/vomiting
- Use antiemetic from another class the patient is not already taking
- Use of suppositories[1] may be helpful if the patient cannot take oral medication and IV access is not readily available; however, severity of condition may warrant IV antiemetics
- Instruct the patient to go to the Acute Cancer Care Center if not improving and/or not able to drink fluids



[1] Suppositories should not be used in patients with an absolute neutrophil count (ANC) < 1.0 K/uL and/or a platelet count < 50 K/uL
[2] See Appendix D for medication dosing specifics
[3] If patient responds, consider around-the-clock dosing of the agent to which they responded and re-evaluate appropriateness periodically during period of risk
[4] ABH = Ativan® (lorazepam), Benadryl® (diphenhydramine), Haldol® (haloperidol)
[5] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen: a) risk of immunosuppression; b) avoid duplicative therapy (may already be part of chemotherapy regimen); c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.
[6] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for more detail and other safety considerations.

Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

SUBSEQUENT CYCLES OF CHEMOTHERAPY

ASSESSMENT OF PRIOR CHEMOTHERAPY CYCLE	ANTIEMETIC RESPONSE	SUBSEQUENT CYCLES
For subsequent cycles of the same chemotherapy regimen, re-evaluate effectiveness of antiemetic regimen and side effects of antiemetic premedication	Patient tolerated treatment with minimal nausea and no vomiting	No change in antiemetic regimen
	Patient tolerated treatment with minimal nausea and no vomiting, but had side effects due to antiemetics	Consider changes in dosing or other management strategies (*i.e.,* other medications, non-pharmacologic measures)
	Patient had one or more episodes of vomiting in a 24 hour period or oral intake significantly decreased due to nausea	Consider any or all of the following[1]: • Adding a benzodiazepine to the regimen • Adding an agent from a different class to the antiemetic regimen (see Appendix D)

[1] Changing to another 5-HT3 RA after failing one has not been shown to be an effective strategy for management of breakthrough nausea and vomiting, although some individual patients have distinct preferences of one 5-HT3 RA over another for prophylaxis

APPENDIX A: Emetogenic Potential of Parenteral Chemotherapy/Biotherapy Agents – High and Moderate

Risk Level	Frequency of Emesis (%)	Chemotherapy/Biotherapy Agents[1]	
High	**Greater than 90%**	• AC combination defined as either doxorubicin or epirubicin with cyclophosphamide • Carboplatin[2] (AUC ≥ 4) • Carmustine (> 250 mg/m^2) • Cisplatin[2] • Cyclophosphamide (> 1,500 mg/m^2) • Dacarbazine • Doxorubicin (> 50 mg/m^2)	• Epirubicin (> 90 mg/m^2) • Fam-trastuzumab deruxtecan-nxki • Ifosfamide (high dose: > 2 grams/m^2/dose) • Mechlorethamine • Melphalan • Sacituzumab govitecan-hziy • Streptozocin
Moderate[1]	**30% to 90%**	• Aldesleukin (≥ 12 million units/m^2/dose) • Arsenic trioxide • Azacitidine • Bendamustine • Busulfan[2] • Carboplatin[2] (AUC < 4) • Carmustine (≤ 250 mg/m^2) • Clofarabine • Cyclophosphamide (≤ 1,500 mg/m^2) • Cytarabine (> 200 mg/m^2) • Dactinomycin • Daunorubicin • Daunorubicin + cytarabine combination (Liposomal) • Dinutuximab	• Doxorubicin (≤ 50 mg/m^2) • Epirubicin (≤ 90 mg/m^2) • Idarubicin • Ifosfamide (≤ 2 grams/m^2/dose) • Irinotecan • Irinotecan (Liposomal) • Lurbinectedin • Methotrexate (≥ 250 mg/m^2) • Naxitamab-gqgk • Oxaliplatin[2] • Romidepsin • Temozolomide • Trabectedin

[1] Not all agents listed are on MD Anderson formulary
[2] Emetogenic risk may vary depending on the dosing, administration and/or concurrently administered chemotherapy

Continued on next page

APPENDIX A: Emetogenic Potential of Parenteral Chemotherapy/Biotherapy – Low and Minimal - continued

Risk Level	Frequency of Emesis (%)	Chemotherapy/Biotherapy Agents[1]			
Low	**10% to 30%**	• Ado-trastuzumab emtansine • Aldesleukin (< 12 million units/m^2/dose) • Amivantamab-vmjw • Axicabtagene ciloleucel (CAR-T)[2] • Belinostat • Brexucabtagene autoleucel (CAR-T)[2] • Brentuximab vedotin • Cabazitaxel • Carfilzomib • Ciltacabtagene autoleucel (CAR-T)[2] • Copanlisib • Cytarabine (low dose: 100 – 200 mg/m^2) • Docetaxel	• Doxorubicin (liposomal) • Elranatamab-bcmm • Enfortumab vedotin-ejfv • Epcortitamab-bysp • Eribulin • Etoposide • 5-Fluorouracil (5-FU) • Floxuridine • Gemcitabine • Gemtuzumab ozogamicin • Idecabtagene vicleucel (CAR-T)[2] • Isatuximab-irfc • Ixabepilone	• Lisocabtagene maraleucel (CAR-T)[2] • Loncastuximab tesirine-lpyl • Methotrexate (> 50 mg/m but < 250 mg/m^2) • Mirvetuximab soravtansine-gynx • Mitomycin • Mitomycin pyelocalyceal solution • Mitoxantrone • Necitumumab • Paclitaxel • Paclitaxel protein-bound • Pemetrexed • Pentostatin	• Polatuzumab vedotin-piiq • Pralatrexate • Tafasitamab-cxix • Tagraxofusp-erzs • Talimogene laherparepvec • Talquetamab-tgvs • Tebentafusp-tebn • Teclistamab-cqyv • Thiotepa • Tisagenlecleucel (CAR-T)[2] • Tisotumab vedotin-tftv • Topotecan

[1] Not all agents listed are on MD Anderson formulary
[2] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone; see Appendix D for more details

Continued on next page

APPENDIX A: Emetogenic Potential of Parenteral Chemotherapy/Biotherapy – Low and Minimal - continued

Risk Level	Frequency of Emesis (%)	Chemotherapy/Biotherapy Agents[1]			
Minimal	**Less than 10%**	• Alemtuzumab • Asparaginase • Atezolizumab[2] • Avelumab[2] • Bevacizumab • Bleomycin • Blinatumomab • Bortezomib • Cemiplimab-rwlc • Cetuximab • Cladribine • Cytarabine (< 100 mg/m^2) • Daratumumab • Daratumumab + Hyaluronidase-fihj SubQ combination	• Decitabine • Dostarlimab-gxly[2] • Durvalumab[2] • Elotuzumab • Fludarabine • Glofitamab-gxbm • Inotuzumab ozogamicin • Ipilimumab[2] • Luspatercept-aamt • Margetuximab-cmkb • Methotrexate (≤ 50 mg/m^2) • Mogamulizumab-kpkc • Mosunetuzumab-axgb • Nelarabine	• Nivolumab[2] • Nivolumab + Relatimab-rmbw[2] • Obinutuzumab • Ofatumumab • Panitumumab • Pegaspargase • Peginterferon • Pembrolizumab[2] • Pertuzumab • Pertuzumab + Trastuzumab + Hyaluronidase-zzxf SubQ combination • Ramucirumab • Retifanlimab-dlwr • Rituximab • Rituximab + Hyaluronidase SubQ combination	• Siltuximab • Sirolimus protein-bound • Temsirolimus • Toripalimab • Trastuzumab • Trastuzumab + hyaluronidoase-oysk SubQ combination • Tremelimumab-actl[2] • Valrubicin • Vinblastine • Vincristine • Vincristine (liposomal) • Vinorelbine • Ziv-aflibercept

[1] Not all agents listed are on MD Anderson formulary
[2] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone; see Appendix D for more details

Continued on next page

APPENDIX A: Emetogenic Potential of ORAL Chemotherapy/Biotherapy - continued

Note: Oral continuous dosing of chemotherapy/biotherapy for prolonged periods of time presents an emetogenic classification challenge as the emetogenic risk is likely overestimated in the product information. Therefore, an individualized approach is recommended and utilizing as needed antiemetics instead of routine premedication is often sufficient.

Emetogenic Risk	Chemotherapy/Biotherapy Agents[1]
High to Moderate	• Avapritinib • Azacitidine • Busulfan (≥ 4 mg/day) • Cyclophosphamide (≥ 100 mg/m^2/dose) • Etoposide • Fedratinib • Lenvatinib (≥ 12 mg/dose) • Lomustine[2] • Midostaurin • Mitotane • Niraparib • Olaparib • Procarbazine • Rucaparib • Selinexor[2] • Temozolomide (> 75 mg/m^2/dose) • Trifluridine-tipiracil
Low to Minimal	• Abemaciclib • Abiraterone • Acalabrutinib • Adagrasib • Afatinib • Alectinib • Alpelisib • Asciminib • Altretamine • Apalutamide • Axitinib • Belzutifan • Bexarotene • Binimetinib • Bosutinib • Brigatinib • Busulfan (< 4 mg/day) • Cabozantinib • Capecitabine • Capivasertib • Capmatinib • Ceritinib • Chlorambucil • Cobimetinib • Crizotinib • Cyclophosphamide (< 100 mg/m^2/dose) • Dabrafenib • Dacomitinib • Darolutamide • Dasatinib • Decitabine + cedazuridine combination • Duvelisib • Elacestrant • Elfornithine • Enasidenib • Encorafenib • Entrectinib • Enzalutamide • Erdafitinib • Erlotinib • Estramustine • Everolimus • Fludarabine • Fruquintinib • Futibatinib • Gefitinib • Gilteritinib • Glasdegib • Hydroxyurea • Ibrutinib • Idelalisib • Imatinib • Ivosidenib • Ixazomib • Lapatinib • Larotrectinib • Lenalidomide • Lenvatinib (< 12 mg/dose) • Lorlatinib • Melphalan • Mercaptopurine • Methotrexate • Mobocertinib • Neratinib • Nilotinib • Nirogacestat • Olutasidenib • Osimertinib • Palbociclib • Panobinostat • Pazopanib • Pemigatinib • Pexidartinib • Pirtobrutinib • Pomalidomide • Ponatinib • Pralsetinib • Quizartinib • Regorafenib • Repotrectinib • Ribociclib • Ripretinib • Ruxolitinib • Selpercatinib • Sonidegib • Sorafenib • Sotorasib • Sunitinib • Talazoparib • Tazemetostat • Temozolomide (≤ 75 mg/m^2/dose) • Tepotinib • Thalidomide • Thioguanine • Tivozanib • Topotecan • Trametinib • Tretinoin • Tucatinib • Vandetanib • Vemurafenib • Venetoclax • Vismodegib • Vorinostat • Zanubrutinib

[1] Not all agents listed are on MD Anderson formulary
[2] The panel recommends the use of prophylactic antiemetic(s)

APPENDIX B: Antiemetic Suggestions for Multi-Day HEC or MEC Chemotherapy

General Principles

- Patients receiving multiday HEC or MEC chemotherapy are at risk for both acute and delayed nausea/vomiting dependent on agents being administered
- There is a lack of robust evidence to support every clinical scenario and decisions should be individualized to the specific regimen, administration setting, duration of action and appropriate dosing intervals of antiemetics, tolerability of daily antiemetics, and particular risk factors

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Steroid suggestions

- Dexamethasone[1,2] may be administered daily and continued for 2-3 days after chemotherapy regimens likely to cause delayed emesis

Serotonin antagonist (5-HT3 RA) suggestions

- Repeat intervals for 5-HT3 RA are dependent on the product used
- Of note, data is available for repeat every 48 hours dosing for palonosetron

Neurokinin-1 antagonist suggestions

- Data supports the use of aprepitant prior to each dose of multi-day chemotherapy and for up to 2 days after (up to 7 days total) or fosaprepitant, repeat dosing but no sooner than 3 days
- Can be considered for chemotherapy regimens likely to cause delayed emesis

Olanzapine suggestions

- If utilized prophylactically as part of antiemetic regimen, recommend daily dosing and continue 2-3 days after chemotherapy regimens likely to cause delayed emesis

HEC = Highly Emetogenic Chemotherapy
MEC = Moderately Emetogenic Chemotherapy

[1] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen:
a) risk of immunosuppression;
b) avoid duplicative therapy, may already be part of chemotherapy regimen;
c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.

[2] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for other safety considerations.

APPENDIX C: Antiemetic Regimens for Prevention of Acute and Delayed CINV

Olanzapine/Serotonin Antagonist/Steroids/Neurokinin-1 Antagonist - HEC

- Olanzapine 5 – 10 mg PO daily on Days 1 – 4

Choose one from **each** category below:

- Serotonin antagonist (5-HT3 RA)[1]
  - Granisetron 1 mg IV on Day 1
  - Ondansetron 8 – 16 mg IV on Day 1
  - Palonosetron 0.25 mg IV on Day 1
- Steroids[2,3]
  - Dexamethasone 12 mg IV on Day 1; then 8 mg PO once daily on Days 2 – 3
- Neurokinin-1 antagonist[4]
  - Aprepitant 125 mg PO on Day 1; then 80 mg PO on Days 2 – 3
  - Fosaprepitant 150 mg IV on Day 1

- PRN antiemetic options for home
  - Prochlorperazine* 5 – 10 mg PO every 6 hours prn nausea/vomiting
  - Ondansetron 8 mg PO every 12 hours prn nausea/vomiting (do not give 5-HT3 RA at home if long-acting 5-HT3 RA administered on Day 1)
  - Metoclopramide* 5 – 10 mg PO every 6 hours prn nausea/vomiting
  - Promethazine* 12.5 – 25 mg PO every 6 hours prn nausea/vomiting

HEC = Highly Emetogenic Chemotherapy

Continued on next page

[1] All 5-HT3 RAs are considered therapeutically equivalent when dosed appropriately, see Appendix D. Ondansetron preferred; palonosetron is long acting.

[2] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen: a) risk of immunosuppression; b) avoid duplicative therapy, may already be part of chemotherapy regimen; c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.

[3] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for other safety considerations.

[4] May interact with cytochrome P450 enzyme (CYP enzyme); check for drug interactions – see Appendix D

* These options are similar in mechanism and have additive adverse effects when given together. The panel recommends choosing one option.

APPENDIX C: Antiemetic Regimens for Prevention of Acute and Delayed CINV - continued

Olanzapine/Serotonin Antagonist/Steroids - HEC or MEC

- Olanzapine 5 – 10 mg PO daily on Days 1 – 4

Choose one from **each** category below:

- Serotonin antagonist (5-HT3 RA)[1]
  - Granisetron 1 mg IV on Day 1
  - Ondansetron 8 – 16 mg IV on Day 1
  - Palonosetron 0.25 mg IV on Day 1

- Steroids[2,3]
  - Dexamethasone 12 mg IV on Day 1

- PRN antiemetic options for home
  - Prochlorperazine* 5 – 10 mg PO every 6 hours PRN nausea/vomiting
  - Ondansetron 8 mg PO every 12 hours PRN nausea/vomiting (do not give 5-HT3 RA at home if long-acting 5-HT3 RA administered on Day 1)
  - Metoclopramide* 5 – 10 mg PO every 6 hours PRN nausea/vomiting
  - Promethazine* 12.5 – 25 mg PO every 6 hours PRN nausea/vomiting

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HEC = Highly Emetogenic Chemotherapy
MEC = Moderately Emetogenic Chemotherapy

[1] All 5-HT3 RAs are considered therapeutically equivalent when dosed appropriately, see Appendix D. Ondansetron preferred; palonosetron is long acting.

[2] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen:
a) risk of immunosuppression;
b) avoid duplicative therapy, may already be part of chemotherapy regimen;
c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.

[3] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for other safety considerations.

* These options are similar in mechanism and have additive adverse effects when given together. The panel recommends choosing one option.

APPENDIX C: Antiemetic Regimens for Prevention of Acute and Delayed CINV- continued

Serotonin Antagonist/Steroids/Neurokinin-1 Antagonist: HEC or MEC

Choose one from **each** category below:

- Serotonin antagonist (5-HT3 RA)[1]
  - Granisetron
    - 1 mg IV on Day 1 (may continue with PO formulation at home for 2 – 3 days after chemotherapy completed)
    - 3.1 mg/24 hour patch[2] topically (apply 24 – 48 hours prior to chemotherapy; sustained release over 7 days)
  - Ondansetron 8 – 16 mg IV on Day 1 (may continue with PO formulation at home for 2 – 3 days after chemotherapy completed)
  - Palonosetron 0.25 mg IV on Day 1 (data is available to support repeat dosing at 48 hours)
- Steroids[3,4]
  - Dexamethasone
    - If aprepitant/fosaprepitant: dexamethasone 12 mg IV on Day 1; then 8 mg PO daily on Days 2 – 3
    - If rolapitant: dexamethasone 12 mg IV on Day 1; then 8 mg PO daily on Days 2 – 3
  - For non-cisplatin containing regimens consider steroid sparing options after completion of chemotherapy
- Neurokinin-1 antagonist
  - Aprepitant[5] 125 mg PO on Day 1; then 80 mg PO on Days 2 and 3 (may continue 80 mg daily while receiving chemotherapy and 2 days after completion)
  - Fosaprepitant[5] 150 mg IV on Day 1 (single dose lasts for 3 days; may repeat dosing, but no sooner than 3 days)
  - Rolapitant 180 mg PO on Day 1

- PRN antiemetic options for home
  - Prochlorperazine[*] 5 – 10 mg PO every 6 hours prn nausea/vomiting
  - Ondansetron 8 mg PO every 12 hours prn nausea/vomiting (do not give 5-HT3 RA at home if long-acting 5-HT3 RA administered on Day 1)
  - Consider scheduled short-acting 5-HT3 RA for the first 2 – 3 days after chemotherapy (do not give 5-HT3 RA at home if long-acting 5-HT3 RA administered on Day 1)
  - Metoclopramide[*] 5 – 10 mg PO every 6 hours prn nausea/vomiting
  - Promethazine[*] 12.5 – 25 mg PO every 6 hours prn nausea/vomiting

HEC = Highly Emetogenic Chemotherapy MEC = Moderately Emetogenic Chemotherapy

[1] All 5-HT3 RAs are considered therapeutically equivalent when dosed appropriately, see Appendix D. Ondansetron preferred; palonosetron is long acting.

[2] Restricted drug on MD Anderson Formulary

[3] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen:
a) risk of immunosuppression; b) avoid duplicative therapy, may already be part of chemotherapy regimen; c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.

[4] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for other safety considerations.

[5] May interact with cytochrome P450 enzyme (CYP enzyme); check for drug interactions – see Appendix D

[*] These options are similar in mechanism and have additive adverse effects when given together. The panel recommends choosing one option.

Continued on next page

Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

APPENDIX C: Antiemetic Regimens for Prevention of Acute and Delayed CINV- continued

Serotonin Antagonist/Steroids: MEC

Choose one from **each** category below:

- Serotonin antagonist (5-HT3 RA)[1]
  - Granisetron
    - 1 mg IV on Day 1 (may continue with PO formulation at home for 2 – 3 days after chemotherapy completed)
    - 3.1 mg/24 hour patch[2] topically (apply 24 – 48 hours prior to chemotherapy; sustained release over 7 days)
  - Ondansetron 8 – 16 mg IV (may continue with PO formulation at home for 2 – 3 days after chemotherapy completed)
  - Palonosetron 0.25 mg IV (data is available to support repeat dosing at 48 hours)
- Steroids[3,4]
  - Dexamethasone 12 mg IV on Day 1; then 8 mg PO daily on Days 2 – 3
  - For some non-cisplatin containing regimens, consider steroid sparing options after completion of chemotherapy

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- PRN antiemetic options for home
  - Prochlorperazine* 5 – 10 mg PO every 6 hours prn nausea/vomiting
  - Ondansetron 8 mg PO every 12 hours prn nausea/vomiting (do not give 5-HT3 RA at home if long-acting 5-HT3 RA administered on Day 1)
  - Metoclopramide* 5 – 10 mg PO every 6 hours prn nausea/vomiting
  - Promethazine* 12.5 – 25 mg PO every 6 hours prn nausea/vomiting

MEC = Moderately Emetogenic Chemotherapy

[1] All 5-HT3 RAs are considered therapeutically equivalent when dosed appropriately, see Appendix D. Ondansetron preferred; palonosetron is long acting.
[2] Restricted drug on MD Anderson Formulary
[3] The following features of steroids should be considered in patients with hematologic malignancies prior to prescribing them as part of the antiemetic regimen:
a) risk of immunosuppression;
b) avoid duplicative therapy, may already be part of chemotherapy regimen;
c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials. See Appendix D for other safety considerations.
[4] Use of steroids is not recommended with cellular therapies and when immune checkpoint inhibitors are given alone. See Appendix D for other safety considerations.
* These options are similar in mechanism and have additive adverse effects when given together. The panel recommends choosing one option.

APPENDIX D: Antiemetic Medication Options

Medication	Adult Dosage	Comments
Anxiolytics		
Alprazolam (Xanax®) Lorazepam (Ativan®)	0.5 – 1 mg PO every 6 hours 0.5 – 1 mg PO, SL or IV every 6 hours	• **Indication:** anticipatory CINV (drug class of choice) • **Class adverse effects[1]:** sedation, dizziness, disorientation, hypotension, amnesia • Lorazepam SL is administered using the oral concentrate formulation • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[2] for more information)
Atypical Antipsychotics		
Olanzapine (Zyprexa®)	Prevention: 2.5 – 10 mg PO daily on Days 1 – 4 Breakthrough: 2.5 – 5 mg PO twice a day **or** 10 mg PO daily for 3 days	• **Indication:** prophylaxis for acute and delayed CINV (with a 5-HT3 RA plus dexamethasone with or without an NK1 RA) • **Adverse effects[1]:** drowsiness, dizziness, hyperglycemia, restlessness, extrapyramidal symptoms. • Avoid concomitant use with metoclopramide and haloperidol due to increased risk of extrapyramidal reactions • **QTc prolongation[3]** possible Torsade's de Pointes (TdP) - medication can cause QT prolongation **but** there is insufficient evidence that when used as directed in labeling, the medication is associated with a risk of causing TdP • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[2] for more information)

Continued on next page

[1] Adverse effects are not all inclusive, refer to package insert

[2] 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society, 71*(7), 2052-2081 doi:10.1111/jgs.18372

[3] For QTc prolongation information, see www.Crediblemeds.org

APPENDIX D: Antiemetic Medication Options – continued

Medication	Adult Dosage	Comments
Butyrophenones		
Haloperidol (Haldol®)	0.5 – 2 mg IV every 6 hours (see also ABH on Page 20)	• **Indication:** treatment of breakthrough CINV • **Adverse effects[1]:** sedation, tachycardia, hypotension, restlessness, extrapyramidal symptoms (may co-administer with benzodiazepine or antihistamine to avoid this) • **QTc prolongation[2]:** known risk of TdP - medication causes QT prolongation and is clearly associated with a risk of TdP • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[3] for more information)
Cannabinoids		
Dronabinol (Marinol®)	5 – 10 mg capsule **or** 2.1 – 4.2 mg/m^2 oral solution 3 to 4 times daily	• **Indication:** prophylaxis for acute and delayed CINV refractory to other antiemetics • **Adverse effects[1]:** dizziness, somnolence, sleep disturbances, confusion, hallucinations • Avoid abrupt discontinuation of therapy which may precipitate withdrawal
Nabilone (Cesamet®)[4]	1 – 2 mg PO twice a day	

[1] Adverse effects are not all inclusive, refer to package insert
[2] For QTc prolongation information, see www.Crediblemeds.org
[3] 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society, 71*(7), 2052-2081 doi:10.1111/jgs.18372
[4] Not on MD Anderson Formulary

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APPENDIX D: Antiemetic Medication Options – continued

Medication	Adult DosaAge		Comments
Neurokinin-1 Antagonists	ACUTE (before)	DELAYED	
Aprepitant (Emend®)	125 mg PO	80 mg PO daily for 2 days	• **Indication:** prophylaxis of acute and delayed CINV (with 5-HT3 RA plus dexamethasone) • **Class adverse effects**[1]: hiccups, fatigue, dizziness, diarrhea • Decrease dexamethasone dose by 50% with concomitant use (same day) of aprepitant and fosaprepitant • Drug interactions due to CYP3A4 inhibition for aprepitant and fosprepitant; CYP2D6 with rolapitant • Rolapitant has only been studied with single-day chemotherapy regimens
Fosaprepitant (Emend® IV)	150 mg IV	None recommended (Note: See dosing with dexamethasone)	
Rolapitant (Varubi®)	180 mg PO	None recommended	

Medication	Adult Dosage	Comments
Non-Phenothiazine Antihistamines/Anticholinergics		
Diphenhydramine (Benadryl®)	12.5 – 50 mg PO or IV every 6 hours (may dose every 4 hours)	• **Indication:** co-administered with other antiemetics to manage toxicity • **Adverse effects**[1]**:** sedation, dry mouth, blurred vision, agitation, paradoxical reactions (excitement) • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[2] for more information)
Scopolamine transdermal patch (Transderm Scop®)	1 patch (1.5 mg) topically every 72 hours	• **Indication:** treatment of breakthrough CINV • **Adverse effects**[1]**:** drowsiness, dizziness, xerostomia, confusion, agitation • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[2] for more information)

[1] Adverse effects are not all inclusive, refer to package insert

[2] 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society, 71*(7), 2052-2081 doi:10.1111/jgs.18372

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APPENDIX D: Antiemetic Medication Options – continued

Medication	Adult Dosage	Comments
Phenothiazine Antihistamines		
Prochlorperazine (Compazine®)	• 5 – 10 mg PO or IV every 6 hours (may dose every 4 hours) • 25 mg per rectal (PR) every 12 hours	• **Indication:** treatment of breakthrough CINV; prophylaxis for acute and delayed CINV (with low-risk agents) • **Class adverse effects[1]:** sedation, dry mouth, extrapyramidal symptoms, constipation, blurred vision • **QTc prolongation[2]:** possible risk of TdP - medication can cause QT prolongation **but** there is insufficient evidence that when used as directed in official labeling, the medication is associated with a risk of causing TdP (promethazine) • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[3] for more information)
Promethazine (Phenergan®)	• 12.5 – 25 mg PO or IV every 6 hours (may dose every 4 hours) • 25 mg PR every 6 hours • 6.25 mg/0.1 mL in PLO gel[4] topically every 4 hours	
Prokinetic Agents		
Metoclopramide (Reglan®)	• Standard dose 5 – 20 mg PO or IV every 6 hours (doses can be as high as 40 mg PO or IV every 6 hours) • High dose 0.5 – 2 mg/kg IV with diphenhydramine 25 mg IV every 4 hours	• **Indication:** breakthrough CINV, prophylaxis of acute (high-dose only) and delayed (with steroids) CINV • **Adverse effects[1]:** sedation, diarrhea, extrapyramidal symptoms (especially with high dose, may co-administer with benzodiazepine or antihistamine to avoid this), tremors, akathisia • Contraindication in patients with GI obstruction • **QTc prolongation[2]:** Conditional risk of TdP - these drugs are associated with a risk of TdP **but** only under certain conditions (*e.g.* excessive dose, hypokalemia, congenital long QT or by causing a drug-drug interaction that results in excessive QT prolongation) • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[3] for more information)

[1] Adverse effects are not all inclusive, refer to package insert
[2] For QTc prolongation information, see www.Crediblemeds.org
[3] 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society, 71*(7), 2052-2081 doi:10.1111/jgs.18372
[4] Not on MD Anderson Formulary

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APPENDIX D: Antiemetic Medication Options – continued

Medication	Adult Dosage		Comments
Serotonin Antagonists (5-HT3 RA)	ACUTE (before)	DELAYED	
Dolasetron (Anzemet®)[1]	100 – 200 mg PO	100 mg PO daily	• **Indication:** prophylaxis of acute and delayed CINV • Dolasetron available as oral tablet only. IV use is not recommended by FDA. • Apply granisetron patch 24 - 48 hours prior to chemotherapy administration • FDA has amended the product information of ondansetron to limit single intravenous doses to 16 mg • Palonosetron: repeat dose of 0.25 mg IV at 48 hours after first dose appears safe and effective • **Class adverse effects[2]:** headache, constipation, fatigue • **QTc prolongation[3]:** increased risk of QTc prolongation has been observed with IV formulations of ondansetron, dolasetron, and granisetron ◦ Dolasetron and granisetron: possible risk of TdP – these medications can cause QT prolongation **but** there is insufficient evidence that when used as directed in official labeling, the medications are associated with a risk of causing TdP ◦ Ondansetron: known risk of TdP - medication causes QT prolongation and is clearly associated with a risk of TdP, consider EKG monitoring especially with doses > 16 mg per day • **Short-acting 5-HT3 RAs include:** ◦ Dolasetron ◦ Granisetron (IV/PO formulations) ◦ Ondansetron (all formulations)
Granisetron Kytril® – IV/PO	1 – 2 mg PO **or** 1 mg IV	2 mg PO daily **or** 1 mg PO twice a day	
Sancuso® – patch	3.1 mg/24 hours patch topically (total dose delivered 34.3 mg/7 days)	Not Applicable	
Ondansetron (Zofran®) (preferred agent) Oral disintegrating tablet, tablet, oral solution, IV	8 – 16 mg PO **or** 8 – 16 mg IV	8 mg PO twice a day **or** 8 mg PO every 8 hours **or** 16 mg PO daily **or** 8 mg IV twice a day **or** 8 mg IV every 8 hours	
Palonosetron (Aloxi®)	0.25 mg IV	None recommended	

[1] Not on MD Anderson Formulary
[2] Adverse effects are not all inclusive, refer to package insert.
[3] For QTc prolongation information, see www.CredibleMeds.org

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APPENDIX D: Antiemetic Medication Options – continued

Medication	Adult Dosage		Comments
Steroids	**ACUTE (as premedication)**	**DELAYED**	
Dexamethasone (Decadron®)	Day 1: 10 – 12 mg PO or IV[1]	Days 2 – 4 (or longer): 4 – 8 mg PO or IV twice daily	• **Indication:** prophylaxis of acute and delayed CINV • Caution in patients with hematologic malignancies[2] • Use of steroids is not recommended with immune and/or cellular therapies. A steroid sparing prophylactic antiemetic regimen is preferred when: ◦ Immune checkpoint inhibitors are administered alone, as these are low emetogenic risk and alternative antiemetics should be considered. When immune and/or cellular therapies are combined with moderate and high emetogenic risk chemotherapy, the panel recommends steroids to be avoided but may be used at the discretion of the disease site service. ◦ Cellular therapies, including lymphodepleting chemotherapy preparative regimens, as the risk of inactivating the immune response is very high with even small doses of steroids. Avoiding the use of steroids for 3 - 5 days prior to and 90 days after cell administration is optimal. • **Class adverse effects[3]:** hyperglycemia, insomnia, hiccups, dyspepsia, agitation, weight gain, hypertension ◦ Increased risk of infection with prolonged use > 2 weeks
Dexamethasone with either aprepitant 125 mg PO **or** fosaprepitant 115 mg IV	10 – 12 mg PO or IV[1]	8 mg PO daily for 3 days	
Dexamethasone with fosaprepitant 150 mg IV	10 – 12 mg PO or IV[1]	Day 2: 8 mg PO daily Days 3 – 4: 8 mg PO twice daily	

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[1] Higher doses may be considered in certain circumstances
[2] The following features of steroids should be considered in patient with hematologic malignancies prior to prescribing them as part of the antiemetic regimen: a) risk of immunosuppression; b) avoid duplicative therapy, may already be part of chemotherapy regimen; c) inherent activity against hematologic malignancies may mask beneficial effects of chemotherapy in clinical trials
[3] Adverse effects are not all inclusive, refer to package insert

APPENDIX D: Antiemetic Medication Options – continued

Medication	Adult Dosage	Comments
Combination Products (capsules and suppositories compounded at MDACC Pharmacy)		
ABH capsules: • Lorazepam 0.34 mg • Diphenhydramine 25 mg • Haloperidol 1.5 mg	1 capsule PO every 6 hours	• **Indication:** treatment of breakthrough CINV; prophylaxis of delayed CINV (refractory to other antiemetics) • Adverse effects as per individual agents • Additive amounts are not equal between the routes of administration due to absorption variances • **QTc prolongation[1]:** known risk of TdP - medication causes QT prolongation and is clearly associated with a risk of TdP (haloperidol) • Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria[2] for more information)
ABH IV: • Lorazepam 0.5 mg • Diphenhydramine 12.5 – 25 mg • Haloperidol 0.5 – 1 mg	Given concurrently IV every 6 hours (need to order each agent separately)	

[1] For QTc prolongation information, see www.Crediblemeds.org

[2] 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*. doi:10.1111/jgs.18372

SUGGESTED READINGS

2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*. doi:10.1111/jgs.18372

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