RISK ASSESSMENT

Assess for level of patient risk
- Young age
- Female
- Non-alcohol drinker
- Non-steroid user
- History of motion sickness
- Those previously failing conventional antiemetic therapy

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 risk factors¹ for anticipatory nausea/vomiting?

Yes

Pharmacologic interventions:
- Alprazolam 0.5 – 2 mg PO prior to chemotherapy or
- Lorazepam 1 – 2 mg IV or PO prior to chemotherapy

Behavioral therapy – consider referral to Integrative Medicine for:
- Relaxation techniques
- Hypnosis
- Systematic desensitization

For IV chemotherapy regimens - See Pages 2 and 3
For PO chemotherapy regimens - See Page 4
For IV/PO combination chemotherapy, use highest emetogenic agent to determine antiemetics

No

Prevention of chemotherapy-induced nausea and vomiting (CINV)

¹ Risk factors for anticipatory nausea/vomiting are not clearly defined in the literature, but could broadly be listed as: previous nausea/vomiting with prior chemotherapy; history of motion sickness; history of emesis during pregnancy or hyperemesis gravidarum; female gender.
Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson’s specific patient population; MD Anderson’s services and structure; and MD Anderson’s clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers. This algorithm should not be used to treat pregnant women.

IV CHEMOTHERAPY HIGH (HEC) AND MODERATE (MEC) RISK

PREVENTION/PROPHYLAXIS

HEC single day ONLY:
Olanzapine, serotonin antagonist (SA), steroid, neurokinin-1 antagonist (NK1) (see Page 10)

HEC or MEC, single and multi-day:
SA, NKA, steroid (see Page 11)

HEC or MEC, single day ONLY:
Olanzapine, SA, steroid (see Page 12)

MEC single or multi-day ONLY:
SA, steroid (see Page 13)

Refer to beginning for each day of chemotherapy (see specific antiemetic regimens)

Last day of chemotherapy?

Yes

For subsequent cycles, see Page 6

No

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 H2 antagonist or proton pump inhibitor (PPI) for dyspepsia

3 All SAs are considered therapeutically equivalent when dosed appropriately; see Appendix C (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 C for other safety considerations

5 Use of steroids is not recommended with immune and/or cellular therapies. See Appendix C for other safety considerations

6 May interact with cytochrome P450 enzyme (CYP enzyme); check for drug interactions – see Appendix C
This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson’s specific patient population; MD Anderson’s services and structure; and MD Anderson’s clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers. This algorithm should not be used to treat pregnant women.

**IV CHEMOTHERAPY LOW AND MINIMAL EMETOGENIC RISK**

<table>
<thead>
<tr>
<th>Prevention of CINV</th>
<th>For breakthrough nausea/vomiting, see Page 5</th>
</tr>
</thead>
</table>

**PREVENTION/PROPHYLAXIS**

Prior to start of chemotherapy:
- Short-acting SA\(^1\) PO or IV or
- Steroids\(^4,5\) PO or IV or
- Phenothiazine PO or IV or
- Prokinetic agent PO or IV

(Note: Order above does not indicate preference. See Appendix C for dosing and scheduling)

Prophylactic antiemetics not required prior to the first cycle of chemotherapy

For re-assessment/subsequent cycles, see Page 6

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\(^1\) 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 SAs are considered therapeutically equivalent when dosed appropriately, see Appendix C (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 C for other safety considerations.

\(^5\) Use of steroids is not recommended with immune and/or cellular therapies. See Appendix C for other safety considerations.
Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

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Prevention of CINV

**ORAL CHEMOTHERAPY EMETOGENIC RISK**

- **High to Moderate Risk**
  - (30% or greater)
  - Antiemetic premedications required

- **Low to Minimal Risk**
  - (less than 30%)
  - No routine premedication required
  - PRN medications recommended for breakthrough nausea/vomiting

**RECOMMENDATION**

- Patient experiences nausea/vomiting

**ANTIEMETIC REGIMEN**

- **Prior to start of chemotherapy:**
  - Oral short-acting SA

For breakthrough nausea/vomiting, see Page 5

For re-assessment/subsequent cycles, see Page 6

---

1 Assess need for histamine H2 antagonist or proton pump inhibitor (PPI) for dyspepsia.

2 See Appendix A for Emetogenic Potential of Chemotherapy/Biotherapy Agents.

3 All SA are considered therapeutically equivalent when dosed appropriately, see Appendix C (ondansetron preferred).
Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV)

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson’s specific patient population; MD Anderson’s services and structure; and MD Anderson’s clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers. This algorithm should not be used to treat pregnant women.

BREATHROUGH NAUSEA AND VOMITING

General principles:
- SA and NKA generally not effective or approved for treatment of breakthrough nausea/vomiting.
- Use antiemetic from another class the patient is not already taking.
- Use of suppositories may be helpful if 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 Emergency Center if not improving and/or not able to drink fluids.

1. Choose an oral agent from a class not already given that day:
   a) Phenothiazine or prokinetic agent
   b) If persistent nausea, give: short-acting SA, or atypical antipsychotic, or ABH combination product
   c) Consider adding steroids and/or benzodiazepine to other classes for synergy as tolerated.

2. Choose an IV agent from a class not already given that day:
   a) Phenothiazine or prokinetic agent (if not already given within 4 hours)
   b) Short-acting SA or high-dose prokinetic agent plus diphenhydramine
   c) Consider adding steroids and/or benzodiazepine to other classes for synergy as tolerated.

Patient able to tolerate PO

Patient experiences breakthrough nausea and vomiting

Patient not able to tolerate PO or has persistent nausea/vomiting with oral antiemetics

Reassess patient prior to subsequent cycles (See Page 6)

1See Appendix C for medication dosing specifics.
2If patient responds, consider around-the-clock dosing of the agent to which they responded and re-evaluate appropriateness periodically during period of risk.

ABH = Ativan® (lorazepam), Benadryl® (diphenhydramine), Haldol® (haloperidol)

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

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson’s specific patient population; MD Anderson’s services and structure; and MD Anderson’s clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers. This algorithm should not be used to treat pregnant women.

**ASSESSMENT OF PRIOR CHEMOTHERAPY**

For subsequent cycles of the same chemotherapy regimen, re-evaluate effectiveness of antiemetic regimen and side effects of antiemetic premedication.

**ANTIEMETIC RESPONSE**

- Patient tolerated treatment with minimal nausea and no vomiting
- Patient tolerated treatment with minimal nausea and no vomiting, but had side effects due to antiemetics
- Patient had one or more episodes of vomiting in a 24 hour period or oral intake significantly decreased due to nausea

**SUBSEQUENT CYCLES OF CHEMOTHERAPY**

- No change in antiemetic regimen
- Consider changes in dosing or other management strategies (i.e., other medications, non-pharmacologic measures)
- Consider any or all of the following:
  - Adding a benzodiazepine to the regimen
  - Adding an agent from a different class to the antiemetic regimen (see Appendix C)
  - Substituting high-dose intravenous metoclopramide (with diphenhydramine) for the SA

1 Changing to another SA 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 SA over another for prophylaxis.
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**APPENDIX A: Emetogenic Potential of IV Chemotherapy/Biotherapy Agents – High and Moderate**

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Frequency of Emesis (%)</th>
<th>Chemotherapy/Biotherapy Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Greater than 90%</td>
<td>● Doxorubicin (greater than 50 mg/m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Epirubicin (greater than 90 mg/m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Ifosfamide (high dose: greater than 2 grams/m²/dose)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Methotrexate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Streptozocin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Cisplatin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Carmustine (greater than 250 mg/m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Cyclophosphamide (greater than 1,500 mg/m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Dacarbazine</td>
</tr>
<tr>
<td>Moderate</td>
<td>30% to 90%</td>
<td>● Doxorubicin (less than or equal to 50 mg/m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Epirubicin (less than or equal to 90 mg/m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Idarubicin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Ifosfamide (less than or equal to 2 grams/m²/dose)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Interferon alpha (greater than or equal to 10 million units/m²/dose)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Irinotecan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Liposomal irinotecan*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Melphalan*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Methotrexate (greater than or equal to 250 mg/m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Oxaliplatin*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Tenoposamide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Trabectedin</td>
</tr>
</tbody>
</table>

1 Emetogenic risk may vary depending on the dosing, administration and/or concurrently administered chemotherapy.

*Not on MDACC Pharmacy Formulary as of September, 2016

**CONTINUED ON NEXT PAGE**
APPENDIX A Continued: Emotogenic Potential of IV Chemotherapy/Biotherapy – Low and Minimal

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Frequency of Emesis (%)</th>
<th>Chemotherapy/Biotherapy Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>10% to 30%</td>
<td>• Ado-trastuzumab emtansine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Aldesleukin (less than 12 million units/m^2/dose)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alitretinine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Belinostat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blinatumomab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Brentuximab Vedotin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cabazitaxel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Carfilzomib</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cytarabine (low dose:100 - 200 mg/m^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Docetaxel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Doxorubicin (liposomal)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal</td>
<td>Less than 10%</td>
<td>• Aflibercept (IV agent)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alemtuzumab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Asparaginase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Atezolizumab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bevacizumab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bleomycin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bortezomib</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cetuximab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cladribine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cytarabine less than 100 mg/m^2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Daratumumab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Decitabine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Denileukin diftitox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Elotuzumab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fludarabine</td>
</tr>
</tbody>
</table>

*Not on MDACC Pharmacy Formulary as of September, 2016
**APPENDIX A Continued: Emetogenic Potential of ORAL Chemotherapy/Biotherapy**

<table>
<thead>
<tr>
<th>Emetogenic Risk</th>
<th>Chemotherapy/Biotherapy Agents</th>
</tr>
</thead>
</table>
| **High to Moderate** | ● Altretamine  
● Busulfan (greater than or equal to 4 mg/day)  
● Cyclophosphamide (greater than or equal to 100 mg/m²/dose)  
● Estramustine  
● Etoposide  
● Lenvatinib*  
● Lomustine  
● Olaparib  
● Procarbazine  
● Temozolomide (greater than 75 mg/m²/dose) |
| **Low to Minimal** | ● Afatinib  
● Alectinib  
● Axitinib  
● Bexarotene  
● Bosutinib*  
● Busulfan (less than 4 mg/day)  
● Cabozantinib*  
● Capecitabine  
● Ceritinib  
● Chlorambucil  
● Cobimetinib*  
● Crizotinib  
● Cyclophosphamide (less than 100 mg/m²/dose)  
● Dabrafenib  
● Dasatinib  
● Erlotinib  
● Everolimus  
● Fludarabine  
● Gefitinib  
● Hydroxyurea  
● Ibrutinib  
● Idelalisib*  
● Imatinib  
● Ixazomib  
● Lapatinib  
● Lenalidomide  
● Melphalan  
● Mercaptopurine  
● Methotrexate  
● Nilotinib  
● Osimertinib  
● Palbociclib  
● Panobinostat  
● Pazopanib  
● Pomalidomide  
● Ponatinib*  
● Regorafenib (low to minimal oral agent)  
● Ruxolitinib  
● Sonidegib*  
● Sorafenib  
● Sunitinib  
● Temozolomide (less than or equal to 75 mg/m²/dose)  
● Thalidomide  
● Thioguanine  
● Topotecan  
● Trametinib  
● Trifluridine-tipiracil  
● Tretinoin  
● Vandetanib  
● Venetoclax*  
● Vismodegib  
● Vorinostat |

*Not on MDACC Pharmacy Formulary as of September, 2016*
## APPENDIX B: Antiemetic Regimens for Prevention of Acute and Delayed CINV

<table>
<thead>
<tr>
<th>Olanzapine/SA/Steroids/NKA - HEC, single day ONLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Olanzapine 10 mg PO daily on Days 1 - 4</td>
</tr>
<tr>
<td>Choose one from each category below:</td>
</tr>
<tr>
<td>• Serotonin antagonist¹</td>
</tr>
<tr>
<td>○ Granisetron 1 mg IV</td>
</tr>
<tr>
<td>○ Ondansetron 8-16 mg IV</td>
</tr>
<tr>
<td>○ Palonosetron 0.25 mg IV</td>
</tr>
<tr>
<td>• Steroids</td>
</tr>
<tr>
<td>○ Dexamethasone² 3 12 mg IV on Day 1; then 8 mg PO once daily on Days 2 - 3</td>
</tr>
<tr>
<td>• Neurokinin-1 antagonist³</td>
</tr>
<tr>
<td>○ Aprepitant 125 mg PO on Day 1; then 80 mg PO on Days 2 – 3</td>
</tr>
<tr>
<td>○ Fosaprepitant 150 mg IV</td>
</tr>
<tr>
<td>PRN antiemetics at home</td>
</tr>
<tr>
<td>○ Prochlorperazine 5 – 10 mg PO every 6 hours prn nausea/vomiting</td>
</tr>
<tr>
<td>○ Ondansetron 8 mg PO every 12 hours prn nausea/vomiting (do not give SA at home if long-acting SA administered on Day 1)</td>
</tr>
</tbody>
</table>

¹ All SAs are considered therapeutically equivalent when dosed appropriately, see Appendix C (ondansetron preferred).

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 C for other safety considerations.

³ Use of steroids is not recommended with immune and/or cellular therapies. See Appendix C for other safety considerations.

⁴ May interact with cytochrome P450 enzyme (CYP enzyme); check for drug interactions – see Appendix C.

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APPENDIX B: Antiemetic Regimens for Prevention of Acute and Delayed CINV – continued from previous page

<table>
<thead>
<tr>
<th>SA/Steroids/NKA: HEC and/or MEC, single or multi-day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose one from each category below:</td>
</tr>
<tr>
<td>• Serotonin antagonist ¹</td>
</tr>
<tr>
<td>○ Granisetron</td>
</tr>
<tr>
<td>□ 1 mg IV</td>
</tr>
<tr>
<td>■ 3.1 mcg/24 hour patch (apply 24 - 48 hours prior to chemotherapy; sustained release over 7 days)</td>
</tr>
<tr>
<td>○ Ondansetron 8 – 16 mg IV (multi-day chemotherapy – repeat daily followed by PO at home for 2 - 3 days after chemotherapy completed)</td>
</tr>
<tr>
<td>○ Palonosetron 0.25 mg IV (multi-day chemotherapy – data is available to support daily or every other day dosing)</td>
</tr>
<tr>
<td>• Steroids</td>
</tr>
<tr>
<td>○ Dexamethasone ², ³</td>
</tr>
<tr>
<td>● If aprepitant/fosaprepitant: dexamethasone 12 mg IV on day 1; then 8 mg PO daily on Days 2 - 3</td>
</tr>
<tr>
<td>● If rolapitant: dexamethasone 20 mg IV on day 1; then 8 mg PO twice a day on Days 2 - 3</td>
</tr>
<tr>
<td>○ For non-cisplatin containing regimens consider steroid sparing options after completion of chemotherapy</td>
</tr>
<tr>
<td>• Neurokinin-1 antagonist</td>
</tr>
<tr>
<td>○ Aprepitant ¹ 125 mg PO on day 1; then 80 mg PO on days 2 and 3 (multi-day chemotherapy – may continue 80 mg daily while receiving chemotherapy and 2 days after completion)</td>
</tr>
<tr>
<td>○ Fosaprepitant ⁴</td>
</tr>
<tr>
<td>● 150 mg IV on day 1 only (single day chemotherapy – single dose lasts for 3 days; multi-day chemotherapy - may repeat dosing, but no sooner than 3 days)</td>
</tr>
<tr>
<td>○ Rolapitant ² 180 mg PO on day 1 only</td>
</tr>
<tr>
<td>• PRN antiemetics at home</td>
</tr>
<tr>
<td>○ Prochlorperazine 5 – 10 mg PO every 6 hours prn nausea/vomiting</td>
</tr>
<tr>
<td>○ Ondansetron 8 mg PO every 12 hours prn nausea/vomiting (do not give SA at home if long-acting SA administered on Day 1)</td>
</tr>
<tr>
<td>○ Consider scheduled short-acting SA for the first 2 - 3 days after chemotherapy (do not give SA at home if long-acting SA administered on Day 1)</td>
</tr>
</tbody>
</table>

¹Formulary addition pending.
²All SAs are considered therapeutically equivalent when dosed appropriately, see Appendix C (ondansetron preferred).
³The 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 C for other safety considerations.
⁴Use of steroids is not recommended with immune and/or cellular therapies. See Appendix C for other safety considerations.
⁵May interact with cytochrome P450 enzyme (CYP enzyme); check for drug interactions – see Appendix C

CONTINUED ON NEXT PAGE
APPENDIX B: Antiemetic Regimens for Prevention of Acute and Delayed CINV – continued from previous page

**Olanzapine/SA/Steroids - HEC and/or MEC, single day ONLY**

- **Olanzapine** 10 mg PO daily on Days 1 - 4

Choose one from **each** category below:

- **Serotonin antagonist**
  - Granisetron 1 mg IV
  - Ondansetron 8 – 16 mg IV
  - Palonosetron 0.25 mg IV

- **Steroids**
  - Dexamethasone 2, 3 20 mg IV on day 1; then 8 mg PO twice a day on Days 2 - 3

-----------------------------------------------------------------------------------------------------------------------------

**PRN antiemetics at 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 SA at home if long-acting SA administered on day 1)

---

1 All SAs are considered therapeutically equivalent when dosed appropriately, see Appendix C (ondansetron preferred).
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 C for other safety considerations.
3 Use of steroids is not recommended with immune and/or cellular therapies. See Appendix C for other safety considerations.

**CONTINUED ON NEXT PAGE**
## APPENDIX B: Antiemetic Regimens for Prevention of Acute and Delayed CINV – continued from previous page

<table>
<thead>
<tr>
<th>SA/Steroids: MEC ONLY, single or multi-day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose one from each category below:</td>
</tr>
<tr>
<td>• Serotonin antagonist(^1)</td>
</tr>
<tr>
<td>○ Granisetron</td>
</tr>
<tr>
<td>- 1 mg IV</td>
</tr>
<tr>
<td>- 3.1 mcg/24 hour patch (apply 24 - 48 hours prior to chemotherapy; sustained release over 7 days)</td>
</tr>
<tr>
<td>○ Ondansetron 8 – 16 mg IV (multi-day chemotherapy – repeat daily followed by PO at home for 2 - 3 days after chemotherapy completed)</td>
</tr>
<tr>
<td>○ Palonosetron 0.25 mg IV (multi-day chemotherapy – data is available to support daily or every other day dosing)</td>
</tr>
<tr>
<td>• Steroids</td>
</tr>
<tr>
<td>○ Dexamethasone(^2,3) 20 mg IV on Day 1; then 8 mg PO twice a day on Days 2 – 3</td>
</tr>
<tr>
<td>○ For some non-cisplatin containing regimens consider steroid sparing options after completion of chemotherapy</td>
</tr>
</tbody>
</table>

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• PRN antiemetics at 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 SA at home if long-acting SA administered on Day 1)
  ○ Consider scheduled short-acting SA for the first 2 - 3 days after chemotherapy (do not give SA at home if long-acting SA administered on Day 1)

\(^1\) All SAs are considered therapeutically equivalent when dosed appropriately, see Appendix C (ondansetron preferred).
\(^2\) 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 C for other safety considerations.
\(^3\) Use of steroids is not recommended with immune and/or cellular therapies. See Appendix C for other safety considerations.
APPENDIX C: Antiemetic Medication Options

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<thead>
<tr>
<th>Medication</th>
<th>Adult Dosage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anxiolytics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alprazolam (Xanax®)</td>
<td>0.5 – 2 mg PO every 6 hours</td>
<td>• Indication: anticipatory CINV (drug class of choice)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Class adverse effects(^1): sedation, dizziness, disorientation, hypotension, amnesia,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lorazepam SL is administered using the oral concentrate formulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria for more information)(^2)</td>
</tr>
<tr>
<td>Lorazepam (Ativan®)</td>
<td>0.5 – 2 mg PO, SL or IV every 6 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Atypical Antipsychotics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olanzapine (Zyprexa®)</td>
<td>Prevention: 10 mg PO daily on Days 1 - 4</td>
<td>• Indication: prophylaxis for acute and delayed CINV (with a SA plus dexamethasone with or without an NKA).</td>
</tr>
<tr>
<td></td>
<td>Breakthrough: 2.5 – 5 mg PO twice a day or 10 mg PO daily times 3 days</td>
<td>• Olanzapine 5 mg not as effective, but maybe practical if 10 mg not tolerated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adverse effects(^1): drowsiness, dizziness, hyperglycemia, restlessness, extrapyramidal symptoms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Avoid concomitant use with metoclopramide and haloperidol due to increased risk of extrapyramidal reactions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• QTc prolongation(^3): possible Torsade's de Pointes (TdP) - medication can cause QT prolongation <strong>but</strong> there is insufficient evidence that when used as directed in official labeling, The medication is associated with a risk of causing TdP.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria for more information)(^2)</td>
</tr>
</tbody>
</table>

\(^1\) Adverse effects are not all inclusive, refer to package insert.


\(^3\) www.Crediblemeds.org

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This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson’s specific patient population; MD Anderson’s services and structure; and MD Anderson’s clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers. This algorithm should not be used to treat pregnant women.

Appendix C: Antiemetic Medication Options – continued from previous page

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<tbody>
<tr>
<td><strong>Butyrophenones</strong></td>
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<td></td>
</tr>
</tbody>
</table>
| Haloperidol (Haldol®) | 0.5 – 2 mg IV every 6 hours (see also ABH on page 19) | • **Indication:** treatment of breakthrough CINV  
  • **Adverse effects**: sedation, tachycardia, hypotension, restlessness, extrapyramidal symptoms (may co-administer with benzodiazepine or antihistamine to avoid this)  
  • **QTc prolongation**: known risk of TdP - medication causes QT interval 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 for more information)  

<table>
<thead>
<tr>
<th><strong>Cannabinoids</strong></th>
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</thead>
</table>
| Dronabinol (Marinol®) | 2.5 – 10 mg PO either every 3 hours or every 6 hours | • **Indication:** prophylaxis for acute and delayed CINV refractory to other antiemetics  
  • **Adverse effects**: dizziness, somnolence, sleep disturbances, confusion, hallucinations  
  • Avoid abrupt discontinuation of therapy which may precipitate withdrawal |

Nabilone (Cesamet®)* | 1 – 2 mg PO twice a day |                                                                                                    |

*Not on MDACC Pharmacy Formulary as of September, 2016
1Adverse effects are not all inclusive, refer to package insert.
2 [www.Credibledrugs.org](http://www.Credibledrugs.org)

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## APPENDIX C: Antiemetic Medication Options – continued from previous page

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<tr>
<th>Medication</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Neurokinin-1 Antagonists</strong></td>
<td></td>
<td><strong>ACUTE (before)</strong></td>
</tr>
<tr>
<td>Aprepitant (Emend®)</td>
<td>125 mg PO</td>
<td>80 mg PO daily for 2 days</td>
</tr>
<tr>
<td>Fosaprepitant (Emend® IV)</td>
<td>115 mg IV</td>
<td>Aprepitant 80 mg PO daily for 2 days</td>
</tr>
<tr>
<td></td>
<td>150 mg IV</td>
<td>None recommended (Note: See dosing with dexamethasone)</td>
</tr>
<tr>
<td>Rolapitant (Varubi®)*</td>
<td>180 mg PO</td>
<td>None recommended</td>
</tr>
</tbody>
</table>

| Non-Phenothiazine Antihistamines | | | |
| 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  |

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

*Not on MDACC Pharmacy Formulary as of September, 2016

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## Appendix C: Antiemetic Medication Options – continued from previous page

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<tbody>
<tr>
<td><strong>Phenothiazine Antihistamines</strong></td>
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</tr>
</tbody>
</table>
| Prochlorperazine (Compazine®) | 5 – 10 mg PO or IV every 6 hours (may dose every 4 hours)  
25 mg PR every 12 hours | **Indication:** treatment of breakthrough CINV; prophylaxis for acute and delayed CINV (with low-risk agents)  
**Class adverse effects:** sedation, dry mouth, extrapyramidal symptoms constipation, blurred vision  
**QTc prolongation:** 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 for more information)³ |
| 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 topically every 4 hours (MDACC compounded product) |                                                                                                                                                                                                 |
| **Prokinetic Agents** |                                                                               |                                                                                                                                                                                                 |
| Metoclopramide (Reglan®) | Standard dose 10 – 40 mg PO or IV every 6 hours (may dose every 4 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:** 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:** 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 interval prolongation)  
Exert caution when using in the elderly, as they may be more sensitive to the side effects (see Beers Criteria for more information)³ |

1 Adverse effects are not all inclusive, refer to package insert.  
2 www.Crediblemeds.org  

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<tr>
<td><strong>Serotonin Antagonists (SA)</strong></td>
<td><strong>ACUTE (before)</strong></td>
<td><strong>DELAYED</strong></td>
</tr>
<tr>
<td>Dolasetron (Anzemet®)*</td>
<td>100 – 200 mg PO</td>
<td>100 mg PO daily</td>
</tr>
<tr>
<td>Granisetron Kytril® – IV/PO</td>
<td>1 – 2 mg PO or 1 mg IV</td>
<td>2 mg PO daily or 1 mg PO twice a day</td>
</tr>
<tr>
<td>Sancuso® – patch</td>
<td>3.1 mg/24 hours patch (total dose delivered 34.3 mg/7 days)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Ondansetron (Zofran®) (preferred agent) Oral disintegrating tablet, tablet, oral solution, IV</td>
<td>8 – 24 mg PO or 8 – 16 mg IV</td>
<td>8 mg PO twice a day or 16 mg PO daily or 8 mg IV twice a day</td>
</tr>
<tr>
<td>Palonosetron (Aloxi®)</td>
<td>0.25 mg IV</td>
<td>None recommended</td>
</tr>
</tbody>
</table>

- **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: phase III clinical trials did not allow repeat dosing for 7 days. The optimal timing of repeat doses of palonosetron is currently unknown
- **Class adverse effects:** 1: headache, constipation, fatigue.
- **QTc prolongation:** 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 interval prolongation and is clearly associated with a risk of TdP, consider EKG monitoring especially with doses greater than 16 mg per day.
- **Short-acting SAs include:**
  - Dolasetron (all formulations)
  - Granisetron (IV/PO formulations)
  - Ondansetron (all formulations)

*Note: Not on MDACC Pharmacy Formulary as of September, 2016
1 Adverse effects are not all inclusive, refer to package insert.
2 www.Crediblemeds.org

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Page 18 of 22

Department of Clinical Effectiveness V5
Approved by The Executive Committee of the Medical Staff 02/28/2017
### Appendix C: Antiemetic Medication Options – continued from previous page

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<tr>
<th>Medication</th>
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<tbody>
<tr>
<td><strong>Steroids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dexamethasone (Decadron®)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- <strong>ACUTE (before)</strong></td>
<td>Day 1: 10 – 20 mg IV</td>
<td></td>
</tr>
</tbody>
</table>
| - **DELAYED** | Days 2 - 4 (or longer): 4 – 8 mg PO or IV twice daily | - **Indication:** prophylaxis of acute and delayed CINV
- When administered with aprepitant/fosaprepitant, dexamethasone dose should be decreased to 12 mg instead of 20 mg
- Caution in patients with hematologic malignancies
- Avoid use in patients receiving immunotherapy or cellular therapy
- **Class adverse effects**:
  - hyperglycemia
  - insomnia
  - hiccups
  - dyspepsia
  - agitation
  - weight gain
  - hypertension
  - Increased risk of infection with prolonged use greater than 2 weeks |
| Dexamethasone with either aprepitant 125 mg PO or fosaprepitant 115 mg IV | 12 mg PO or IV | 8 mg PO daily for 3 days |
| Dexamethasone with fosaprepitant 150 mg IV | 12 mg PO or IV | Day 2: 8 mg PO daily
Day 3 - 4: 8 mg PO twice daily |

**Combination Products (capsules and suppositories compounded at MDACC Pharmacy)**

- **ABH capsules:**
  - Lorazepam 0.34 mg
  - Diphenhydramine 25 mg
  - Haloperidol 1.5 mg
- **ABH suppositories:**
  - Lorazepam 1 mg
  - Diphenhydramine 12.5 mg
  - Haloperidol 2 mg
- **ABH IV:**
  - Lorazepam 0.5 mg
  - Diphenhydramine 12.5 – 25 mg
  - Haloperidol 0.5 – 1 mg

- **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**:
  - known risk of TdP - medication causes QT interval 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 for more information) \(^3\)

---

\(^1\) 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. See Appendix C for other safety considerations.

\(^2\) Use of steroids is not recommended with immune and or cellular therapies. See Appendix C for other safety considerations.

\(^3\) Adverse effects are not all inclusive, refer to package insert. 

\(^4\) [www.Crediblemeds.org](http://www.Crediblemeds.org)

SUGGESTED READINGS


Olanzapine


**SUGGESTED READINGS**

**Rolapitant**


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DEVELOPMENT CREDITS

This practice consensus statement is based on majority opinion of the Nausea and Vomiting Work Group at the University of Texas MD Anderson Cancer Center for the patient population. This included the following:

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