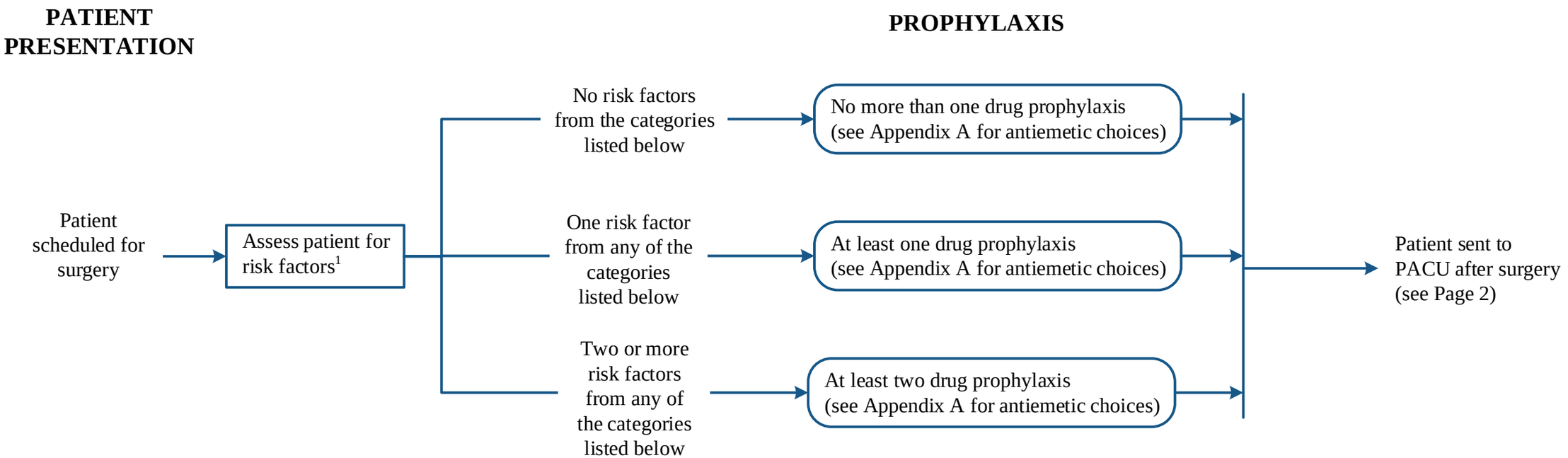
Nausea/Vomiting Associated with Surgery - Adult

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.



[1]MDACC risk factors

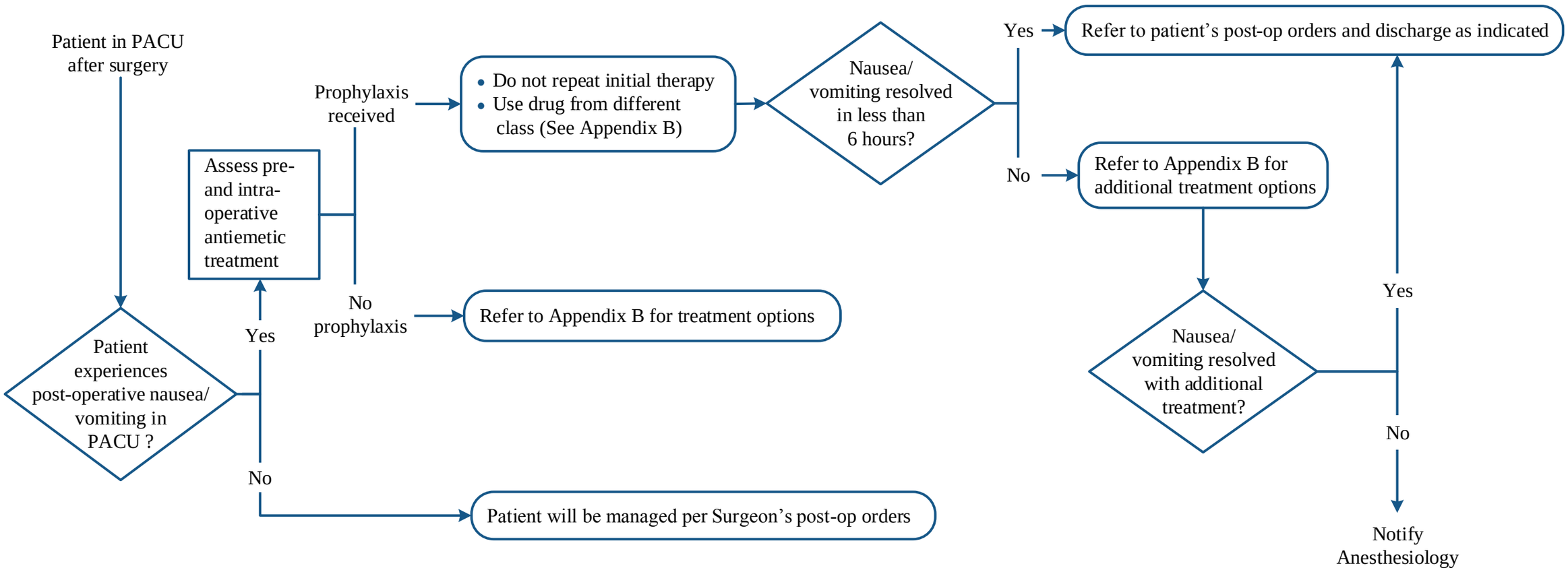
- **Patient specific risk factors:**
  - Female gender
  - Nonsmoking status
  - History of postoperative nausea/vomiting (PONV) or motion sickness
  - Age less than 50 years
- **Anesthetic risk factors:**
  - Use of volatile anesthetics
  - Postoperative opioids
- **Surgical risk factors:**
  - Duration of anesthesia greater than 3 hours
  - Type of surgery (abdominal, gynecologic, breast, head & neck surgery)

Department of Clinical Effectiveness V5
Approved by the Executive Committee of the Medical Staff on 02/27/2018

Nausea/Vomiting Associated with Surgery - Adult

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.

TREATMENT



Nausea/Vomiting Associated with Surgery - Adult

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 A: Antiemetic Medications Options for Prophylaxis or Intraoperative Use

Drug	Dosage	Comments
Anticholinergics Scopolamine Patch (Transderm Scop®)	1.5 mg disc placed behind ear at least 2-4 hours before surgery	• Caution in patients greater than 60 years old • Patch may be applied the night prior to surgery • If not discontinued prior to hospital discharge, patients should be instructed in the safe removal and disposal of the patch
Benzodiazepines Midazolam (Versed®)	35-75 mcg/kg IV	• May be given preoperatively or intraoperatively
Butyrophenones Droperidol (Inapsine®)	0.625 mg IV	• Most effective if given at the **end** of surgery • Requires 2-3 hours of EKG monitoring • Avoid in patients with prolonged QTc interval
Haloperidol (Haldol®)	1 mg IV	• Risk of QTc prolongation precludes its use as a first-line agent • Alternative to droperidol
Corticosteroids Dexamethasone	4 mg IV	• Give shortly after **induction** • Avoid in labile diabetic patients
Neurokinin-1 Antagonists Aprepitant (Emend®)	40 mg PO	• Give within 3 hours before the induction of anesthesia
Phenothiazines Promethazine (Phenergan®)	6.25 mg IV	• Give shortly after **induction** • 6.25 mg dose may require a second dose after 15 minutes; may repeat up to 3 times for a maximum dose of 25 mg • Should not be used in children less than or equal to 2 years old
Prochlorperazine (Compazine®)	5 - 10 mg IV	• Give at the **end** of surgery
Serotonin Antagonists Ondansetron (Zofran®)	4 mg IV	• Give at the **end** of surgery • Risk of QTc prolongation increases with increasing dose
Granisetron	0.35 - 3mg IV	• Give at the **end** of surgery • For patients with history of delayed (post-discharge) post-operative nausea and vomiting

Nausea/Vomiting Associated with Surgery - Adult

APPENDIX B: Antiemetic Medications Options for Treatment or Rescue

Drug	Dosage	Comments
Serotonin Antagonists Ondansetron (Zofran®)	**First Line Agent** 2 mg IV	• Risk of QTc prolongation increases with increasing dose
Phenothiazines Promethazine (Phenergan®)	**Second Line Agents** 6.25 mg IV	• 6.25 mg dose may require a second dose after 15 minutes; may repeat up to 3 times for a maximum dose of 25 mg
Prochlorperazine (Compazine®)	5 - 10 mg IV	
Butyrophenones Droperidol (Inapsine®)	**Third Line Agents** 0.625 mg IV	• Requires 2-3 hours of EKG monitoring • Avoid in patients with prolonged QTc interval
Haloperidol (Haldol®)	1 mg IV	• Risk of QTc prolongation precludes its use as a first-line agent • Alternative to droperidol
Prokinetic Metoclopramide (Reglan®)	**Rescue** 10 mg IV	

Notes:
When nausea and vomiting occur postoperatively, treatment should be administered with an antiemetic from a DIFFERENT pharmacologic class than the drug given for prophylaxis initially.

Re-dosing should only occur if greater than or equal to 6 hours has elapsed since the last dose from that class was given.

SUGGESTED READINGS

Apfel, C. C., Kranke, P., Greim, C. A., & Roewer, N. (2001). What can be expected from risk scores for predicting postoperative nausea and vomiting? *British Journal of Anaesthesia*, *86*(6), 822-827.

Bolac, C. S., Wallace, A. H., Broadwater, G., Havrilesky, L. J., & Habib, A. S. (2013). The impact of postoperative nausea and vomiting prophylaxis with dexamethasone on postoperative wound complications in patients undergoing laparotomy for endometrial cancer. *Anesthesia & Analgesia*, *116*(5), 1041-1047.

Diemunsch, P. (2008, October). Conference of experts--short text. Management of postoperative nausea and vomiting. French Society of Anesthesia and Resuscitation. In *Annales francaises d'anesthesie et de reanimation* (Vol. 27, No. 10, pp. 866-878).

Eberhart, L. H., & Morin, A. M. (2011). Risk scores for predicting postoperative nausea and vomiting are clinically useful tools and should be used in every patient: Con–'life is really simple, but we insist on making it complicated'. *European Journal of Anaesthesiology (EJA)*, *28*(3), 155-159.

Gan, T. J., Diemunsch, P., Habib, A. S., Kovac, A., Kranke, P., Meyer, T. A., … Bergese, S. D. (2014). Consensus guidelines for the management of postoperative nausea and vomiting. *Anesthesia & Analgesia*, *118*(1), 85-113.

Gan, T. J., Meyer, T. A., Apfel, C. C., Chung, F., Davis, P. J., Habib, A. S., … Philip, B. K. (2007). Society for Ambulatory Anesthesia guidelines for the management of postoperative nausea and vomiting. *Anesthesia & Analgesia*, *105*(6), 1615-1628.

Gan, T. J., Meyer, T., Apfel, C. C., Chung, F., Davis, P. J., Eubanks, S., … Tramèr, M. R. (2003). Consensus guidelines for managing postoperative nausea and vomiting. *Anesthesia & Analgesia*, *97*(1), 62-71.

Gomez-Arnau JI, Aguilar JL, Bovaira P, et al. (2010). [Postoperative nausea and vomiting and opioid-induced nausea and vomiting: guidelines for prevention and treatment]. *Rev Esp Anestesiol Reanim*; 57:508-24.

Kranke, P. (2011). Effective management of postoperative nausea and vomiting: let us practice what we preach! *European Journal of Anaesthesiology (EJA)*, *28*(3), 152-154.

Pierre, S. (2011). Risk scores for predicting postoperative nausea and vomiting are clinically useful tools and should be used in every patient: Pro–'Don't throw the baby out with the bathwater'. *European Journal of Anaesthesiology (EJA)*, *28*(3), 160-163.

Rüsch, D., Eberhart, L. H., Wallenborn, J., & Kranke, P. (2010). Nausea and vomiting after surgery under general anesthesia: an evidence-based review concerning risk assessment, prevention, and treatment. *Deutsches Ärzteblatt International*, *107*(42), 733.

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.

DEVELOPMENT CREDITS

This practice consensus algorithm is based on majority expert opinion of the Nausea and Vomiting workgroup at the University of Texas MD Anderson Cancer Center using a multidisciplinary approach that included input from the following healthcare providers:

Katherine Cain, PharmD
Lynn M. Cloutier, ACNP, RN
Jacob Hall, PharmD
Shonice Holdman, MBA ♦
Claire Marten, PharmD
Laura Michaud, PhD, PharmD
Amy Pai, PharmD ♦
Joseph R. Ruiz, MD
Antoinette Van Meter, MD ₸

₸Core Development Team
♦Clinical Effectiveness Development Team