

Combining Preoperative Risk Assessment for PONV with a Clinical Decision Support System

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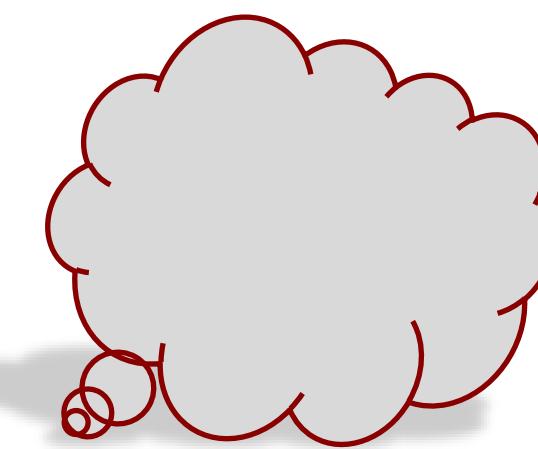
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Significance

What is PONV?



Why does it matter?

- Electrolyte imbalances
- Development of a pneumothorax
- Aspiration pneumonia
- Wound dehiscence
- Delayed recovery time
- Lengthened hospital stay²
(And all financial implications associated with the aforementioned)

Problem / Clinical Inquiry

Problem: Current practice involves a screening tool with limited decision support for antiemetic strategies. Suggestions for possible antiemetic medications or interventions are **non-specific to risk factor types and overall risk stratification level** (e.g. low risk, medium risk, high risk, or 1-4).

Current practice includes a preoperative assessment for PONV risk that:

- Is based on the Apfel
- Limited number of suggestions for antiemetic strategies based on the published guideline.
- Available hyperlink provides extensive medication list that is not practical or efficient for daily practice.

PICO(T)

P - For patients undergoing surgery with general anesthesia,
I - how does a PONV risk screening tool in conjunction with implementing a CDSS that includes prophylactic interventions
C - compared to current practice, which includes pre-operative assessment with limited intervention suggestions
O - affect the incidence and severity of PONV
T - in the immediate postoperative period (Phase I recovery)

Search Strategy

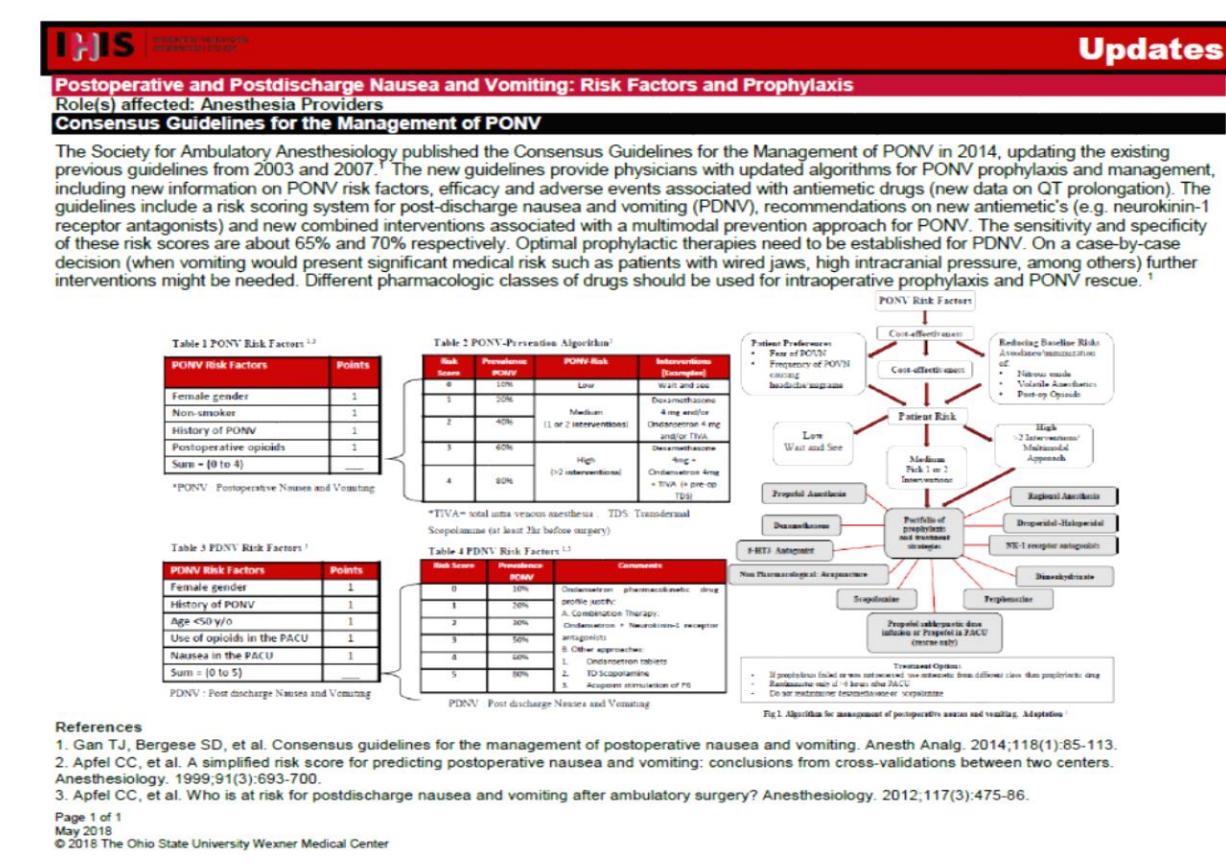
- **Search terms:** “postoperative nausea vomiting”, “prophylaxis”, “screening”, “PONV”, “risk assessment”, “prevention”, “strategy”.
- **Databases:** CINAHL & PubMed
- **Inclusion Criteria:** English written peer-reviewed journal articles
- **Exclusion criteria:** publication date range limited to 2012-2019

Note: the American Society of Perianesthesia Nurses (ASPAN) guidelines, last updated in 2006, were also included.

Critical Appraisal

Total articles Included: 12

- Guidelines: **SAMBA** (2014) and **ASPAN** (2006)
- RCT: 1
- SR: 1
- LRs: 1
- Prospective Studies: 3
- Retrospective Studies: 3
- Other: 1

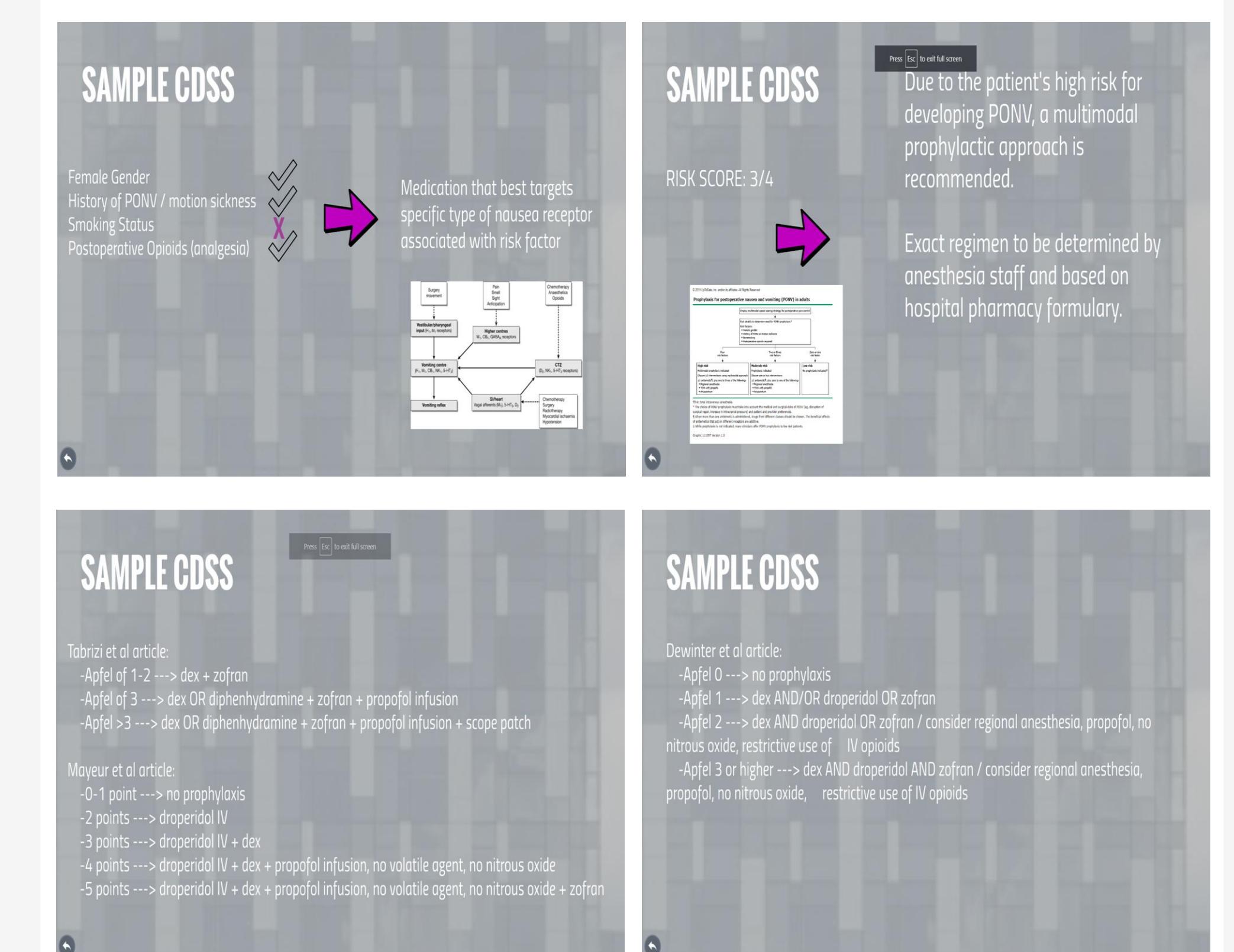


Synthesis Tables

Study / Author	Year	# of Participants	Sample Characteristics	Study Design	Intervention	Major Finding
Apfel et al. “Evidence-based recommendations for preoperative risk assessment and prevention”	2012	25 studies with 25,154 patients	Stratified patients undergoing noncardiac surgery (adults)	Cluster randomization	Questionnaire to evaluate patient-specific risk factors for nausea and vomiting related risk factors	Female gender on the strata were the strongest predictor overall. Data were highly supported by evidence of emergent nausea to vomiting related risk factors.
Kapoor et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2014	11,413 patients	Stratified patients undergoing noncardiac surgery (adults)	Cluster randomization	Control group received care as usual. Intervention group underwent additional risk reduction measures.	No difference in PONV rates between the control and intervention groups. No difference in nausea rates between the control and intervention groups.
Kapoor et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2015	1,480 patients	Stratified patients undergoing noncardiac surgery (adults)	Prospective before and after study	Recommendations for risk reduction measures to add to risk assessments.	Significant reduction in PONV rates in high risk patients. No reduction in low risk patients. Findings were consistent with Kapoor et al’s 2014 study.
Kapoor et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2012	2,662 patients	Stratified patients undergoing noncardiac surgery (adults)	Prospective self-control	Evaluation of a cohort of patients undergoing noncardiac surgery.	Incidence of PONV was significantly higher in patients undergoing abdominal surgery.
Spiegel & Rutledge “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2010	37 patients	Stratified patients undergoing noncardiac surgery (adults)	Observational review	Evaluated available evidence.	Patients more severely impaired by nausea and vomiting had higher PONV risk scores.

Study / Author	Year	# of Participants	Sample Characteristics	Study Design	Intervention	Major Finding
Marin et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2012	623 patients	Stratified patients undergoing noncardiac surgery (adults)	Prospective self-control	Implementation of PONV prevention measures including surgical interventions.	No significant difference in the overall incidence of PONV between the control and intervention groups.
Marin et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2013	601 patients	Adult major surgery undergoing noncardiac surgery (adults)	Prospective self-control	Implementation of PONV prevention measures including surgical interventions.	No significant difference in the overall incidence of PONV between the control and intervention groups.
Desai et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2018	205 patients	Stratified patients undergoing noncardiac surgery (adults)	Prospective self-control	Implementation of PONV prevention measures including surgical interventions.	Incidence of PONV was significantly lower after implementation of PONV prevention measures.
Thomson et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2019	294 patients	Stratified patients undergoing noncardiac surgery (adults)	Prospective self-control	Implementation of PONV prevention measures including surgical interventions.	Incidence of PONV was significantly decreased after implementation of PONV prevention measures.
Thomson et al. “Predicting the incidence of postoperative nausea and vomiting (PONV) in the immediate postoperative period: a prospective study”	2019	310 patients	Adult female patients undergoing noncardiac surgery (adults)	Quality improvement Project	Implementation of PONV prevention measures including surgical interventions.	The use of preoperative risk factors to predict PONV risk and then to guide the use of prophylactic antiemetics was effective in reducing PONV.

Sample Clinical Decision Support (CDSS)

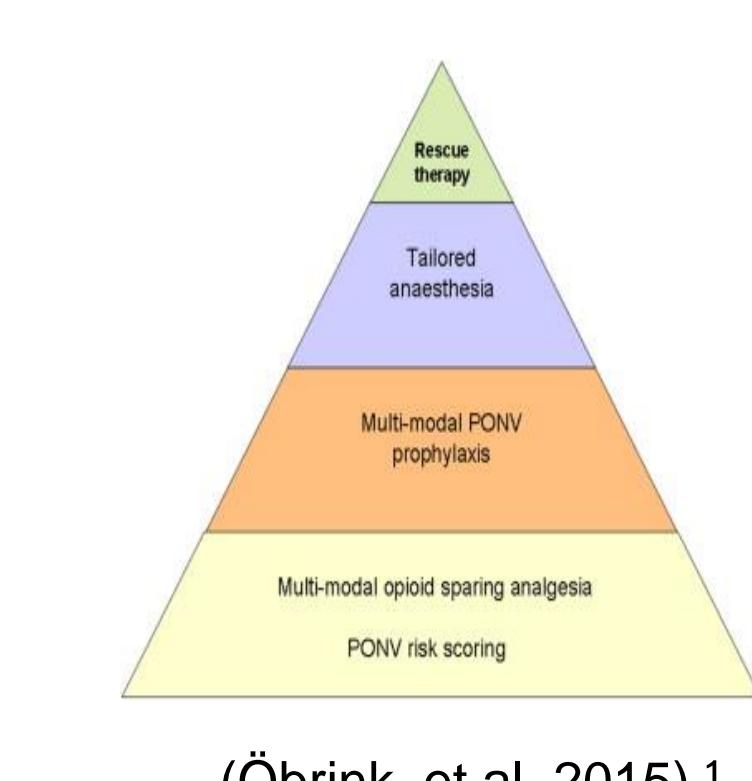


Used in conjunction with a preoperative risk assessment for PONV. After calculating a risk score for PONV, a CDSS can then be used to guide interventions.

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EBP Change Recommendations and Implementation

- Continue using a simplified risk tool based on the Apfel scoring system
- **Blend the risk tool into a newly developed clinical decision support system (CDSS)**
- The risk tool will aid in the assessment of prior history and risk factors to yield a score
- The score result will prompt a suggestive list of possible prophylactic interventions specific to the patient’s risk score / risk type
- This suggestive list will be synthesized using evidence and anesthesia staff recommendations, with attention to hospital formulary
- Establish committee/implementation group with both anesthesia providers and perianesthesia nurses
- Develop formal project protocol
- Meet with implementation group to discuss barriers and facilitators; discuss strategies to mitigate or reduce identified barriers
- Keep stakeholders informed and involved
- Design and implement an updated risk assessment flowsheet blended with a CDSS
- Assure methods for data extrapolation are possible to best monitor compliance and whether the intervention positively affects the incidence of PONV



Implications for Practice

- PONV continues to be an ongoing issue.
- Evidence among multidisciplinary publications supports the use of a simplified algorithm, predominantly suggesting the Apfel SRS, in order to best promote adherence in clinical practice.⁶
- Evidence also supports incorporating recommendations for interventions and antiemetics according to the risk stratification.⁷
- Perioperative staff can use this evidence to reduce the incidence of PONV within their own institutions and positively impact their patients’ outcomes, comfort, and satisfaction.⁸

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