

Clinical Decision Support to Enhance Risk-Based Prevention of Postoperative Nausea and Vomiting

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Background & Purpose

- Postoperative nausea and vomiting (PONV)
 - Common post-surgical complication with negative impacts:¹
 - Higher resource utilization
 - PACU length of stay extension
 - Increased healthcare costs
 - Decreased patient satisfaction
- Prevalence of PONV:²
 - Routine operations: 20-30% of patients
 - Multiple risk factors: ~70%
- Primary Aim: decrease rates of PONV and increase adherence to clinical and institutional prophylaxis guidelines
 - Incorporation of a new clinical decision support (CDS) tool integrated into the anesthesia pre-procedure evaluation
 - Generation of PONV risk factors, risk score and medication plan based off of the risk score
 - Selected without additional clicks to provider
 - modifiable for considerations outside standard guidelines
 - In the intraoperative view of the chart, the in-room provider sees a live PONV checklist in the sidebar summary
 - indicators of completed and remaining medications
 - Special alert for patients with allergies to PONV medications

Methods

- PONV CDS tool was piloted among attending anesthesiologists, certified nurse anesthetists, and anesthesia residents
- Data was collected from 15 respondents using the System Usability Scale (SUS)
- Additional free text options to provide other feedback about the system for improvement

Results

- Mean SUS score was found to be 77.7, (95% CI 72.8-82.6)
 - Correlating with ~82nd percentile ranking
- Based on survey data, most did not find the tool cumbersome to use

Positive components included:

- Ability to use it without the support of a technical person
- Ease of learning how to use the tool quickly
- Lack of learning needed prior to utilizing the tool

Areas of improvement:

- Some users noted the tool to be unnecessarily complex
- Some inconsistencies identified in the system after changes made to the anesthesia plan

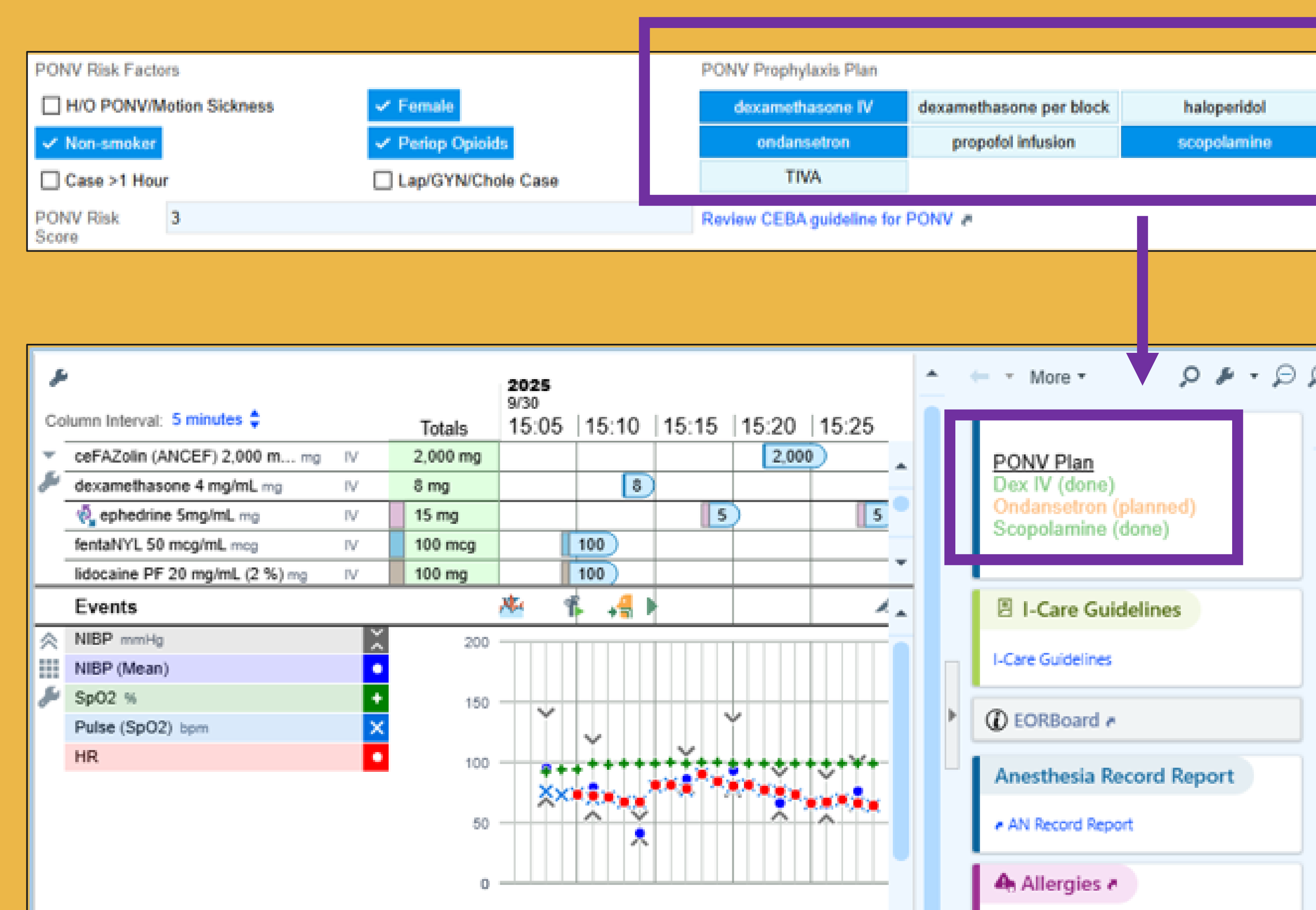


Figure 1: The top portion of the figure demonstrates the PONV risk factors, risk score, and prophylaxis plan as it appears in a sub-section of the preprocedural evaluation. Below, the arrow indicates the intraoperative sidebar view for the in-room provider, displaying the PONV medications administered and those remaining to be administered.

Conclusion & Future Work

Providers were able to use the tool in their daily workflow and ranked it above average for usability in their practice.

Post-Pilot Follow Up:

- Expansion of CDS tool availability to all VUMC anesthesia providers
- Re-evaluation of the first, second-, and third-line antiemetic recommendations
- Desire for consistency between the tool, institutional guidelines, and latest societal recommendations
 - FDA warnings released in late 2025 regarding scopolamine patches in patients >60 years old
- Recommendations or changes from the 5th PONV consensus statement (2025)
- Evaluating effectiveness in improving PONV prophylaxis and reducing rates of PONV in a single center pragmatic cross over trial:
Advancing Strategies to Optimize the Perioperative Management of Postoperative Nausea and Vomiting (ASPIRE-PONV) Trial
Data Collection Sept 2025 – Aug 2026

References

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2. Xiao, M., Yao, D., Fields, K.G. et al. Postoperative and postdischarge nausea and vomiting following ambulatory eye, head, and neck surgeries: a retrospective cohort study comparing incidence and associated factors. Perioper Med 13, 3 (2024). <https://doi.org/10.1186/s13741-024-00360-4>

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ASPIRE PONV Study Design
Manuscript:



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