

# XXVIII IFSO World Congress

9-12 September 2025 | Santiago, Chile



Enhanced Recovery After Surgery  
(ERAS) Protocols in Gastroplasty

Mitigating Postoperative  
Nausea and Vomiting

## IFSO 2025 Santiago

Combined Therapies, The Dawn of a New Era

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# Disclosure Slide

<input checked="" type="checkbox"/>	No, nothing to disclose
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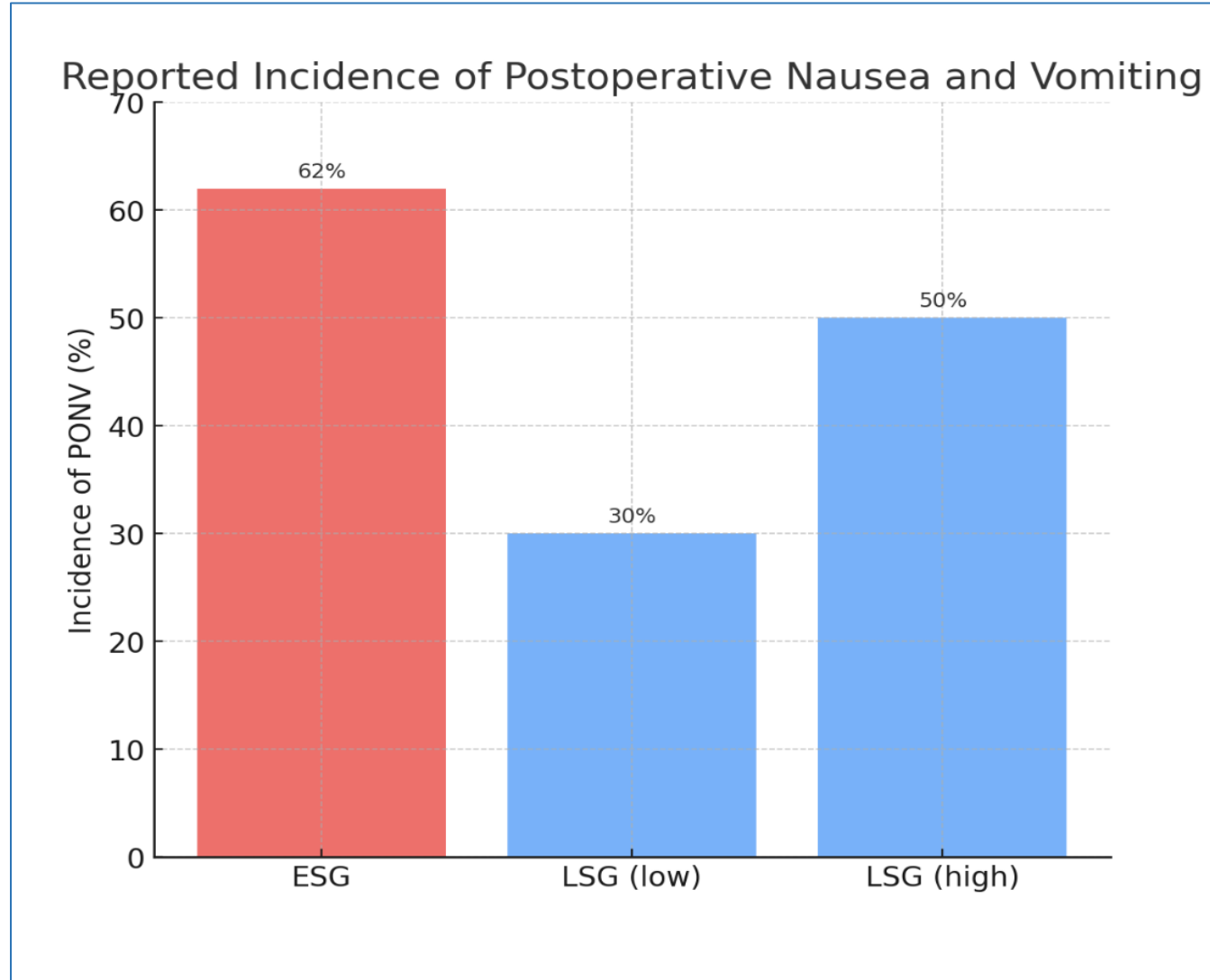
Postoperative Nausea and Vomiting is a distressing experience for the patient and can have a significant impact on patient satisfaction.

# Epidemiological Data



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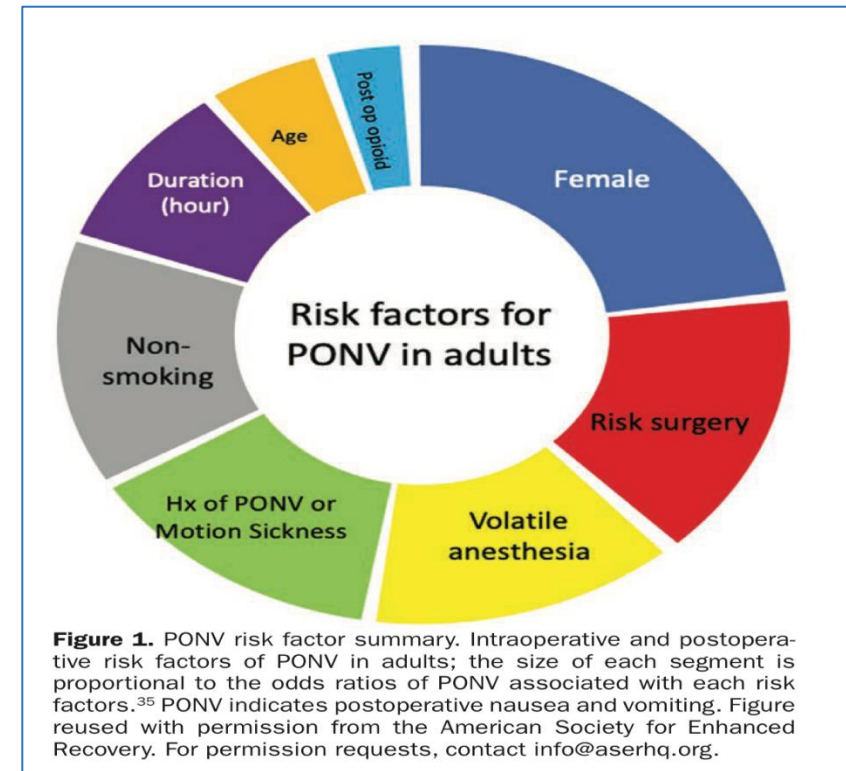
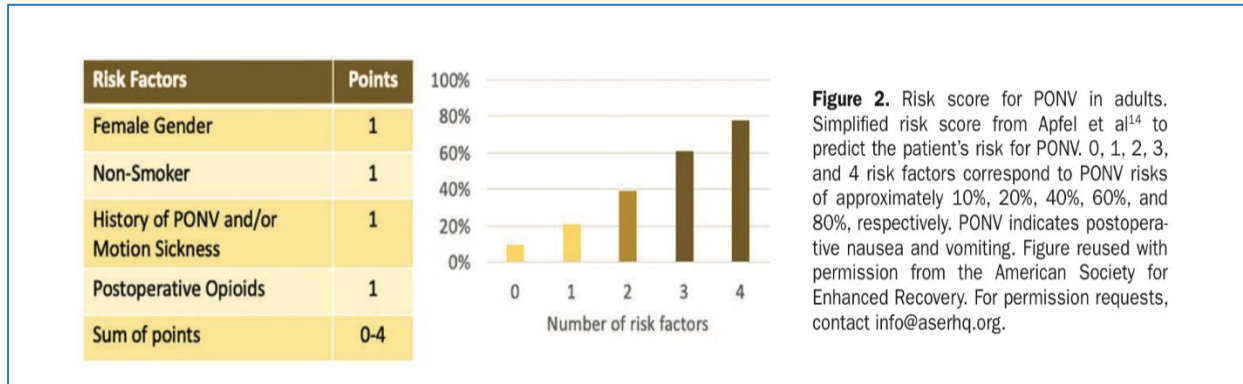
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“The objective is to present an updated ERAS-based strategy to mitigate PONV after endoscopic gastroplasty.”

# 1. Preoperative Strategies

## 1.1) Risk Stratification:





## Comparison of ESG vs LSG: Mechanism of PONV

Factor	ESG (Endoscopic Sleeve)	LSG (Laparoscopic Sleeve)
Gastric distension	↑ Prolonged insufflation → nausea	Less dependent on insufflation
Vagal stimulation	↑ Multiple sutures → vagal reflex	Reduced with resection
Inflammation & edema	↑ Edema from plications	Localized at staple line
Gastric emptying	Delayed, angulations	Straighter tube, more physiological





# 1. Preoperative Strategies

1.2) Patient Education: Preoperative counseling reduces anxiety, a known risk factor for PONV.

**Screening:** Use APAIS (Amsterdam Preoperative Anxiety and Information Scale).

**Table 1.** The Amsterdam Preoperative Anxiety and Information Scale (APAIS)

1. I am worried about the anesthetic.
2. The anesthetic is on my mind continually.
3. I would like to know as much as possible about the anesthetic.
4. I am worried about the procedure.
5. The procedure is on my mind continually.
6. I would like to know as much as possible about the procedure.

The measure of agreement with these statements should be graded on a five-point Likert scale from 1 = not at all to 5 = extremely.

*Laufenberg-Feldmann et al. Is 'anxiety sensitivity' predictive of postoperative nausea and vomiting?: A prospective observational study. Eur J Anaesthesiol. 2019 May;36(5):369-374. doi: 10.1097/EJA.0000000000000979. PMID: 30865002.*

# Stratification



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# Gabapentinoids (Pregabalin, Gabapentin)

- The ERAS Bariatric guidelines do not include pregabalin as a standard recommendation.
- It may be used in local protocols as part of multimodal analgesia, but only if the risk/benefit balance is favorable

## Preoperative Pregabalin in Bariatric Surgery

□ Benefits	△ Risks / Considerations
↓ Postoperative pain (early)	Somnolence, dizziness
↓ Opioid consumption (~30% in 24h)	Respiratory depression risk with opioids
↓ Preoperative anxiety (anxiolytic effect)	Caution in OSA (common in bariatric surgery)
↓ Central sensitization → ↓ chronic pain	Not universally included in ERAS protocols

Hung K. et al.. Analgesic Efficacy of Gabapentin and Pregabalin in Patients Undergoing Laparoscopic Bariatric Surgeries: a Systematic Review and Meta-analysis. *Obes Surg.* 2022 Aug;32(8):2734-2743. doi: 10.1007/s11695-022-06109-6. Epub 2022 May 17. PMID: 35579747.

# 1. Preoperative Strategies



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## 1.3) Fasting & Carbohydrate Loading:

- It significantly decreases postoperative nausea and vomiting (PONV).
  - Improves the metabolic profile : Lower insulin resistance and inflammation.
  - Increased patient's wellness and reduced anxiety.
  - It does not increase the risk of aspiration, without any effect on gastric acidity and residual volume.
  
- 50 g of CHO 2 hours before anesthesia ( $\approx$ 400 mL of a 12.5% solution)

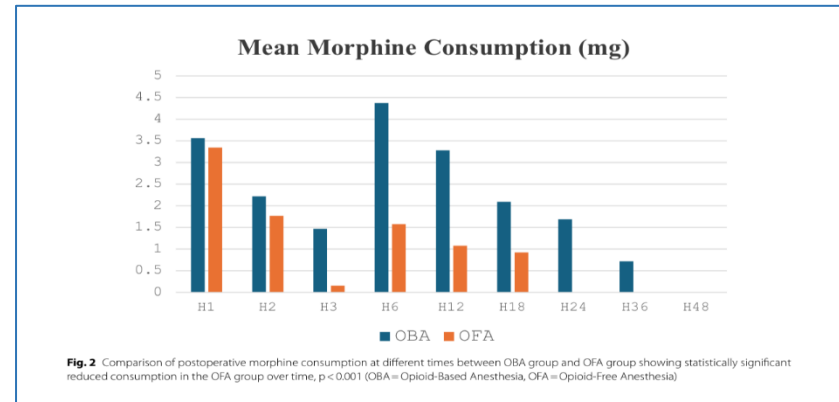
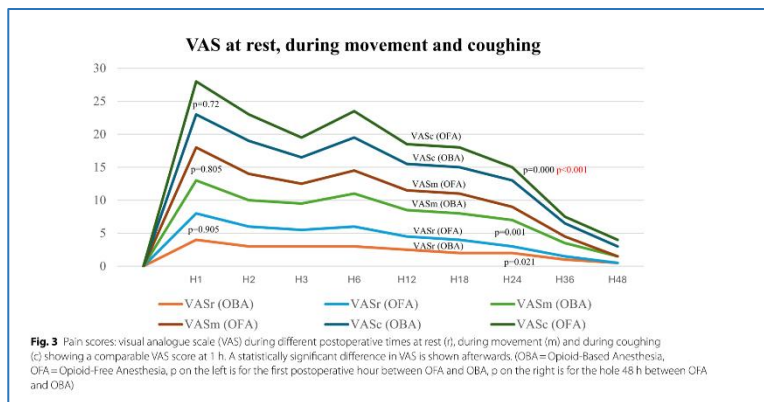
*Suh, Sarah et al. The influence of preoperative carbohydrate loading on postoperative outcomes in bariatric surgery patients: a randomized, controlled trial. Surgery for Obesity and Related Diseases, Volume 17, Issue 8, 1480 – 1488, August 2021*

*Ricci C et al. Preoperative carbohydrate loading before elective abdominal surgery: A systematic review and network meta-analysis of phase II/III randomized controlled trials.. Clin Nutr. 2022 Feb;41(2):313-320. doi: 10.1016/j.clnu.2021.12.016. Epub 2021 Dec 22. PMID: 34999325.*

# 2. Intraoperative Strategies

## 2.1) Multimodal Anesthesia:

- Use of opioid-free anesthesia reduces emetogenic triggers.
- Alternatives include Dexmedetomidine - Magnesium Sulfate – Ketamine



**Table 2** Incidence of Postoperative Nausea and Vomiting in both groups at 2 h and 24 h after surgery showing no significant difference between groups.

	OBA n (%)	OFA n (%)	P
PONV H2	4 (12.5)	4 (15.4)	1.000
PONV H24	8 (25)	3 (11.4)	0.193

OBA=Opioid-Based Anesthesia, OFA=Opioid-Free Anesthesia, PONV= Postoperative Nausea and Vomiting



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# Dexmedetomidine

Highly selective  $\alpha_2$ -adrenergic receptor agonist.

- Decreases presynaptic norepinephrine release → sympatholytic and anxiolytic effect.
- Modulates vagal activity, increasing cardiac parasympathetic tone while reducing the response of emetic reflexes mediated by vagal afferents.
- Reduces opioid requirements

Dose → 0.2-0.5 mcg/kg AdjBW/h adjusted according to blood pressure and heart rate

*Li N, et al. Y. Predominant role of gut-vagus-brain neuronal pathway in postoperative nausea and vomiting: evidence from an observational cohort study. BMC Anesthesiol. 2021 Sep 29;21(1):234. doi: 10.1186/s12871-021-01449-9. PMID: 34587905; PMCID: PMC8480048.*

*Altamimi et al. Dexmedetomidine in Bariatric Surgery: A Systematic Review and Meta-Analysis of Its Effects on Postoperative Pain and Postoperative Nausea and Vomiting. J Clin Med. 2025 Jan 21;14(3):679. doi: 10.3390/jcm14030679. PMID: 39941349; PMCID: PMC11818824.*

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# Magnesium Sulfate



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## → Mechanism of Action

Factor	Effect of Magnesium Sulfate	Impact on PONV
Analgesic adjuvant	NMDA blockade, calcium channel inhibition → less pain, reduced sensitization	↓ opioid requirement
Reduced opioid use	Lower exposure to emetogenic opioids	↓ incidence of PONV
Recovery improvement	Better overall postoperative recovery (comfort, pain, emotional state)	Fewer postoperative symptoms, including PONV

## → Dose : Use IBW or AdjBW for calculating the bolus (30–50 mg/kg)

Hung KC, Chang LC, Ho CN, Hsu CW, Wu JY, Lin YT, Chen IW. Influence of Intravenous Magnesium Sulfate Infusion on the Subjective Postoperative Quality of Recovery: A Meta-Analysis of Randomized Controlled Trials *Nutrients*. 2024 Jul 22;16(14):2375. doi: 10.3390/nu16142375. PMID: 39064818; PMCID: PMC11280250.

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# Ketamine

## → Mechanism of Action

Mechanism	Description	Impact on PONV
<b>Opioid-sparing effect</b>	Reduces intra- and postoperative opioid requirements	Less exposure to emetogenic opioids → ↓ PONV
<b>Hemodynamic stability</b>	Improves cardiovascular stability, preventing hypoperfusion-related nausea	Reduces risk of emetic triggers
<b>NMDA receptor antagonism</b>	Blocks NMDA receptors, reduces central sensitization and nociceptive signaling	Dampens emetic pathways in CNS
<b>Anti-inflammatory action</b>	Lowers release of pro-emetic cytokines (IL-6, TNF- $\alpha$ )	Decreases nausea linked to inflammation
<b>Opioid receptor interaction</b>	Modulates tolerance and desensitization of $\mu$ -opioid receptors	Mitigates indirect emetic mechanisms

→ Dose : Bolus 0.25–0.5 mg/kg IV Ideal/Adjusted Body Weight.

→ Avoid in patients with uncontrolled hypertension, severe coronary disease, increased ICP, or active psychosis.



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# 2. Intraoperative Strategies

2.2) Prophylactic Antiemetics: Triple prophylaxis is a strong strategy supported by ERAS guidelines.

→ Use at least one antiemetic from three different classes, for example:

- 5-HT<sub>3</sub> antagonist
- Corticosteroid
- NK<sub>1</sub> receptor antagonist

Antiemetic Mechanisms of Action			
Drug class	Examples	Mechanism of action	Effect on PONV
<b>5-HT<sub>3</sub> receptor antagonists</b>	Ondansetron, Palonosetron	Block serotonin (5-HT <sub>3</sub> ) receptors in the GI tract and chemoreceptor trigger zone (CTZ)	Prevent emesis triggered by serotonin release from enterochromaffin cells after surgical stress
<b>Corticosteroids</b>	Dexamethasone	Exact mechanism unclear; proposed inhibition of prostaglandins, reduction of serotonin release, and central antiemetic action in NTS/CTZ	Enhance efficacy of other antiemetics, prolong duration of protection, reduce early PONV
<b>NK<sub>1</sub> receptor antagonists</b>	Aprepitant, Fosaprepitant	Block binding of substance P to NK <sub>1</sub> receptors in the brainstem vomiting center (area postrema, NTS)	Strong effect against both early and delayed PONV, synergistic when combined with 5-HT <sub>3</sub> antagonists

*VanderWielen BA, Storm AC, Schroeder DR, Sprung J, Weingarten TN. Incidence of post-operative nausea and vomiting after endoscopic bariatric and metabolic therapy procedures and the role of neurokinin-1 receptor antagonists: a retrospective cohort study. Surg Endosc. 2024 Dec;38(12):7227-7232. doi: 10.1007/s00464-024-11327-3. Epub 2024 Oct 9. PMID: 39382657.*



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## 2. Intraoperative Strategies

2.3) Avoidance of Nitrous Oxide and Volatile Agents: These can increase PONV risk.

*Jewer JK, Wong MJ, Bird SJ, Habib AS, Parker R, George RB. Supplemental perioperative intravenous crystalloids for postoperative nausea and vomiting. Cochrane Database of Systematic Reviews 2019, Issue 3. Art. No.: CD012212. DOI: 10.1002/14651858.CD012212.pub2. Accessed 07 August 2025.*



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# Tranexamic Acid (TXA)

- No RCTs specifically in ESG yet.
- ESG carries risk of mucosal/submucosal bleeding from suturing.
- Observational studies in LSG: Greater gastric bleeding and hematoma formation correlated with higher incidence of PONV and increased need for rescue antiemetics.
- Dose: 1 gr or 10 – 15mg / kg (AdjBW)

*Ksawery Bieniaszewski et al. Effectiveness of Tranexamic Acid in Reducing Hidden Blood Loss During Laparoscopic Sleeve Gastrectomy: A Randomized Clinical Trial J. Clin. Med. 2025, 14(9),3010; <https://doi.org/10.3390/jcm14093010>*

*Al-Juhani A, Sharaf G F, Aseri S, et al. (February 15, 2024) The Role of Tranexamic Acid in Sleeve Gastrectomy: A Systematic Review and Meta-Analysis. Cureus 16(2): e54269. doi:10.7759/cureus.54269*

*Hart L et al. Perioperative administration of tranexamic acid in sleeve gastrectomy to reduce hemorrhage: a double-blind randomized controlled trial J. Surgical Endoscopy (2023) 37:7455–7463 <https://doi.org/10.1007/s00464-023-10232-5>*



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# 3. Postoperative Strategies

**3.1) Early Oral Intake:** Initiating liquids soon after surgery supports gut motility and reduces nausea.

**3.2) Early Mobilization:** Encourages recovery of gastrointestinal function and reduces ileus.

**3.3) Continued Antiemetics:** Scheduled antiemetic therapy for the first 24–48 hours post-op.

**3.4) Opioid-Sparing Analgesia:** Non-opioid analgesics (e.g., acetaminophen, NSAIDs) minimize nausea-related side effects.

*Canzan F et al. (2024) The effect of early oral postoperative feeding on the recovery of intestinal motility after gastrointestinal surgery: a systematic review and meta-analysis of randomized clinical trials. Front. Nutr. 11:1369141. doi: 10.3389/fnut.2024.1369141*

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# What I Do Know



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## Preoperative

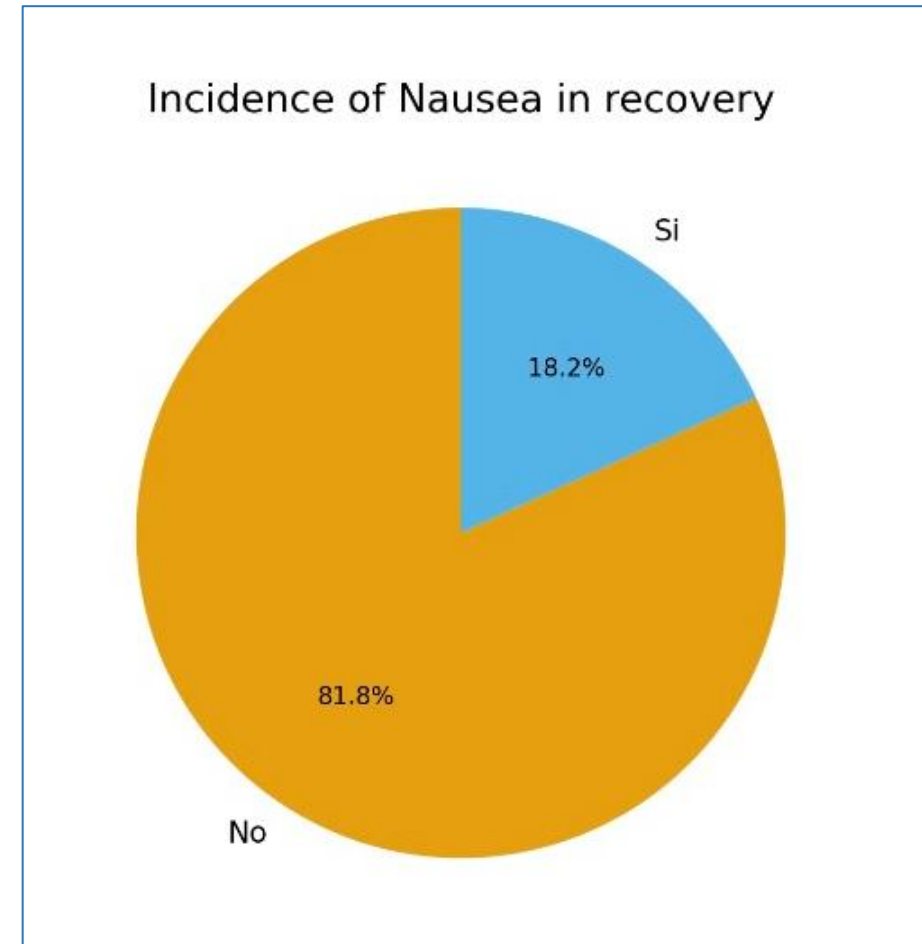
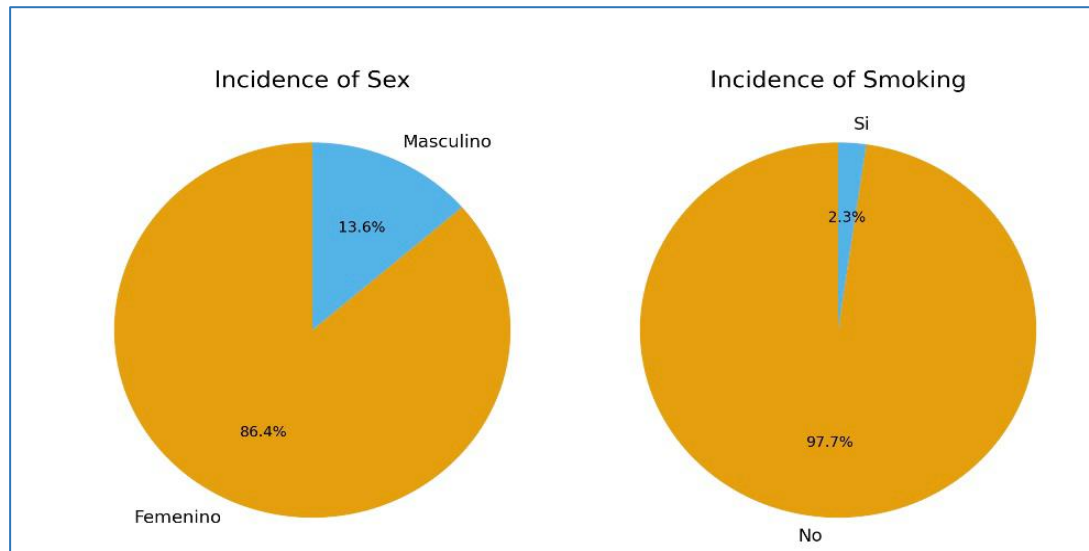
- Risk stratification
- Patient education to reduce anxiety
- Carbohydrate loading before surgery
- 150 mg Pregabalin
- Akynzeo ( Netupitant/Palosentron)





# Local Experience: Our Last 50 Gastroplasties

Variable	Mean	SD	Min	25%	Median	75%	Max
Age (years)	42.0	12.1	15	36.8	41.0	48.3	71
BMI (kg/m <sup>2</sup> )	30.9	3.60	25	28.0	30.5	33.0	43
Surgery Duration (min)	72.8	14.9	52	64.3	69.0	79.8	124





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# Take Home Messages

- PONV remains highly prevalent after gastroplasty procedures.
- Multimodal strategies reduce incidence: avoid opioids, hydrate properly, and use triple prophylaxis.
- Preoperative anxiety is a modifiable risk factor—screening and anxiolysis help.
- Dexmedetomidine, Ketamine, and Magnesium Sulfate are effective non-opioid agents.
- Early oral intake and mobilization support gastrointestinal recovery.
- ERAS-based protocols optimize outcomes and patient satisfaction.





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## Thanks for your Attention.

