Journal of Clinical Anesthesia and Intensive Care

Yurttas T, et al., J Clin Anesth Intensive Care. 2026;6(1):1-5.

Commentary

Systemic lidocaine in bariatric surgery: advances and perspectives in anesthesiology and multimodal pain management – a commentary

Timur Yurttas[1,*], Sebastian Jud[1], Miodrag Filipovic[2]

[1]Department of Anaesthesiology, Rescue– and Pain Medicine, Cantonal Hospital St. Gallen, St. Gallen, HOCH Health Ostschweiz, Switzerland

[2]Department of Perioperative Intensive Care Medicine Cantonal Hospital St. Gallen, St. Gallen, HOCH Health Ostschweiz, Switzerland

*Author for correspondence: Email: Timur.Yurttas@h-och.ch

Received date: February 05, 2026
Accepted date: February 26, 2026

Key Clinical Points

- Patients undergoing bariatric surgery have increased vulnerability to opioid-related adverse events, making multimodal and opioid-sparing strategies a clinical priority.
- Evidence for perioperative systemic lidocaine in bariatric surgery is controverse; pooled benefits in meta-analyses coexist with neutral findings in some contemporary randomized trials.
- In obesity, pharmacokinetic variability and a narrow therapeutic window complicate dosing and raise safety considerations.
- Competing and complementary approaches (ketamine/esketamine, α2-agonists, regional blocks, and optimized PONV prophylaxis) increasingly define recovery quality after bariatric surgery.

Introduction

Postoperative recovery after bariatric surgery is influenced by several factors, including the frequent presence of obstructive sleep apnea (OSA), respiratory complications, heightened sensitivity to opioid-related adverse events (ORADEs), particularly postoperative nausea and vomiting (PONV) and respiratory depression [1]. These features have accelerated the adoption of multimodal, opioid-sparing, opioid-free anesthesia (OFA) in perioperative pathways, frequently embedded within Enhanced Recovery After Surgery (ERAS) programs [2]. Within this setting, perioperative systemic lidocaine has been embraced as an adjunct analgesic because of its proposed anti-hyperalgesic, anti-nociceptive, anti-inflammatory, and opioid-sparing properties [3–7].

Yet the role of systemic lidocaine in bariatric surgery is increasingly debated. Bariatric trials and meta-analyses have reported benefits in pain scores, opioid consumption, PONV, and measures of recovery quality; however, effect sizes vary and heterogeneity is substantial [5–8]. In a prospective, randomized, double-blind, placebo-controlled single-center trial, 137 patients undergoing laparoscopic bariatric surgery received either systemic lidocaine dosed according to lean body mass (LBM) or placebo as part of a standardized anesthetic regimen. Pain scores within the first four postoperative hours, opioid consumption, PONV, bowel function, and length of stay did not differ between groups. The authors discussed that conservative dosing to avoid toxicity, concurrent use of potent short-acting opioids, and a highly optimized multimodal background analgesic strategy may have attenuated any incremental benefit of systemic lidocaine [3]. However, rather than interpreting this divergence as a simple "works/does not work" dichotomy, it may be more informative to view systemic lidocaine as a context-dependent tool whose benefit depends on dosing strategy, background analgesic intensity, and competing modalities [9].

This commentary synthesizes recent evidence relevant to bariatric surgery and obesity (including randomized trials, systematic reviews, safety studies, and patient-centered outcomes research), in order to reassess the role of systemic lidocaine in today's clinical practice and to emphasis areas for future investigation.

Why Lidocaine became Attractive in ERAS-era Bariatric Care

Systemic lidocaine has been proposed to improve perioperative recovery through several mechanisms as a suppression of ectopic neuronal discharge via voltage-gated sodium channel blockade; modulation of central sensitization (including effects on N-methyl-D-aspartate (NMDA) and G-protein coupled pathways); and attenuation of inflammatory cascades, potentially influencing hyperalgesia and visceral pain [5,10,11]. In abdominal surgery, these effects have been associated with reductions in early postoperative pain and opioid consumption, alongside variable impacts on gastrointestinal recovery and hospital length of stay. Insights from spine and colorectal surgery have informed us of the broader understanding of systemic lidocaine's effects, although the generalizability of these findings to bariatric patients is limited due to obesity-specific pharmacokinetic and pathway-related factors [5,6,11–13].

In bariatric surgery, minimizing opioid exposure is a primary clinical goal. Even modest reductions may translate into clinically meaningful reductions in postoperative hypoxemia, sedation, and PONV. Historically, this logic supported protocol-driven systemic lidocaine as a relatively inexpensive, technically simple adjunct that could be combined with acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), ketamine, and antiemetic bundles. However, the same arguments that support lidocaine also apply to an expanding roster of alternatives, and modern multimodal care may diminish the marginal gain of any single additional agent.

Signals of Benefit, Heterogeneity, and what Contemporary Trials Imply

A bariatric-specific systematic review and meta-analysis (seven randomized controlled trials; >600 participants) reported that perioperative systemic lidocaine was associated with improved quality-of-recovery scores, reduced morphine consumption, lower PONV rates, and shorter hospital stay compared with placebo [4]. These pooled findings align with broader evidence in abdominal surgery populations and support the plausibility of clinically relevant benefit in bariatric practice.

However, bariatric trials differ in clinically important ways: lidocaine dosing (bolus and infusion rates), weight scalar (total, adjusted, ideal weight, or LBM), infusion duration (intraoperative only vs extension into early postoperative care), anesthetic maintenance (volatile vs total intravenous anesthesia), and the intensity of background multimodal analgesia (e.g., use of ketamine, magnesium, α2-agonists, NSAIDs, local infiltration, and regional blocks). These sources of heterogeneity are not trivial: they influence both achievable lidocaine exposure and the baseline "room for improvement" in outcomes such as pain, opioid use, and PONV.

Rather than being interpreted as a definitive refutation of lidocaine's role, neutral findings, as in this recently conducted trial dosing systemic lidocaine according to LBM, underscore a broader principle: as perioperative pathways are optimized, incremental benefits from adding one more adjuvant may shrink, and effect estimates derived from older or less standardized settings may not generalize [3]. This dynamic mirrors results observed in other opioid-sparing strategy evaluations, where improvements in PONV may occur without consistent reductions in opioid use or pain intensity when both arms already receive comprehensive multimodal care [14].

Accordingly, a balanced interpretation of the bariatric evidence is that systemic lidocaine can provide benefit in selected contexts, but the magnitude and reliability of that benefit depend on protocol details and co-interventions. The practical question is therefore not whether systemic lidocaine can ever work, but where it is placed within the current landscape of multimodal analgesia and which patients or pathways are most likely to derive a benefit.

Obesity Pharmacokinetics and Safety Narrow the Therapeutic Window

Obesity changes drug disposition through altered cardiac output, tissue composition, hepatic blood flow, and protein binding, introducing variability in both peak concentrations and clearance. For lidocaine, which has a relatively narrow therapeutic window and dose-related toxicity, these issues are especially relevant [15–17]. Dosing based on total body weight can lead to excessive exposure, while ideal body weight may risk underdosing. Adjusted body weight and LBM dosing are often proposed compromises, yet robust outcome-linked exposure targets are not established for bariatric surgery. Notably, the neutral findings of the randomized trial based on LBM may reflect this uncertainty, as there is still insufficient definition of validated concentration-response thresholds for analgesic efficacy in obese bariatric [3].

Safety concerns extend beyond systemic lidocaine monotherapy. Modern multimodal pathways increasingly combine systemic lidocaine with regional anesthesia or local wound infiltration. In obese patients undergoing laparoscopic bariatric surgery, systemic lidocaine provided better postoperative pain control and reduced opioid requirements compared with ultrasound-guided transversus abdominis plane (TAP) block, without increasing side effects [18]. Despite these promising results, this raises concerns for theoretical risk for local anesthetic systemic toxicity (LAST), particularly when timing is close and dosing is substantial. An exploratory dose-escalation trial combining ropivacaine TAP block with systemic lidocaine (both dosed by ideal body weight) observed no clinical LAST, but found that a notable proportion of patients exceeded commonly cited plasma lidocaine concentration thresholds shortly after bolus dosing. Moreover, clinical signs of LAST may be masked under general anesthesia, and plasma concentrations below commonly used thresholds do not exclude intoxication, particularly in the absence of clinically meaningful analgesic effects. This is especially relevant in the context of the increasing use of ERAS pathways, where combinations of systemic lidocaine and regional anesthesia are frequently applied. This could potentially allow delayed or subclinical manifestations of LAST to go unrecognized. Conversely in a small study, the combination of TAP block and systemic lidocaine in bariatric surgery has been associated with enhanced recovery and possible clinical benefit without major reported adverse effects

[15]. These findings reinforce that "absence of observed toxicity" in small studies does not eliminate pharmacological risk, especially in populations with variable clearance and in settings where early symptoms may be masked by anesthesia or sedation.

Consensus recommendations and safety reviews for systemic lidocaine stress careful patient selection, avoidance of high-risk combinations without appropriate timing, standardized dosing ceilings, and readiness to treat LAST (including lipid emulsion therapy) [16,17,19,20]. These considerations argue for institutional standards when systemic lidocaine is used for bariatric surgery, and for caution when combining systemic and regional local anesthetic strategies. With particular regard to LAST mitigation, maximal cumulative lidocaine dosing should be clearly defined when systemic and regional analgesic strategies are co-administered.

Lidocaine among Alternatives

The analgesic options in bariatric surgery have expanded and evolved. Intraoperative usage of esketamine has been reported to reduce the early postoperative pain scores and decrease the need for additional analgesic requirements compared with placebo, with no adverse effects observed at the studied doses [21]. Ketamine has a broader evidence base across surgical populations and is frequently incorporated into multimodal analgesic strategies. In obese patients, meta-analytic evidence supports analgesic benefits of several non-opioid agents, including NSAIDs, acetaminophen, ketamine, α2-agonists, short-acting β-blockade, magnesium and lidocaine, with differences in timing and outcome domains [8,9].

OFA and opioid-minimizing techniques have further reshaped perioperative expectations [22]. In a double-blind randomized trial of bariatric gastric bypass, a multimodal OFA strategy incorporating dexmedetomidine, lidocaine, and ketamine did not significantly reduce 24-hour postoperative morphine consumption compared with a multimodal opioid-based approach, although PONV was less frequent in the OFA group [23]. Otherwise, another recent systematic review showed OFA could be associated with an increased risk for bradycardia. Nonetheless, the use of OFA led to a reduction in postoperative opioid use. These data suggest that administering multimodal co-analgesics broadly may result in meaningful opioid sparing after surgery and could improve PONV [9,24].

Regional anesthesia techniques (e.g., TAP blocks, quadratus lumborum blocks) represent an additional strategy within multimodal analgesia and may provide targeted control of abdominal wall pain [25]. A published protocol for a randomized non-inferiority trial comparing systemic lidocaine with quadratus lumborum block in laparoscopic renal surgery illustrates the growing interest in head-to-head evaluation of systemic versus regional modalities, with patient-centered outcomes such as opioid consumption, pain on movement, and quality of recovery (QoR) [26]. First studies in this field reported promising results in patients undergoing laparoscopic cholecystectomy. Systemic lidocaine provided a quality of recovery non-inferior to erector-spinae-plane block, where both procedures were superior to placebo in terms of pain perception and opioid consumption [27]. Similar comparative effectiveness approaches in bariatric surgery could clarify the relative value of systemic lidocaine versus regional techniques, especially in settings with varying resource and expertise. Collectively, the focus is shifting from placebo-controlled trails towards determining the optimal multimodal strategy for specific clinical pathways and patients.

PONV Prevention, Recovery Quality, and Patient Experience

Recovery after bariatric surgery is often dominated by symptoms other than pain. PONV incidence is particularly high after laparoscopic bariatric surgery and can impede oral intake, mobilization, and patient satisfaction, sometimes contributing to unplanned or prolonged hospitalization [28]. A recent review mapping randomized evidence for PONV prevention in laparoscopic bariatric surgery underscores the diversity of tested interventions and supports a multimodal prophylaxis approach while highlighting ongoing debates about optimal regimens and combinations to improve postoperative, bariatric patient-centered outcomes [29]. In such a landscape, any antiemetic benefit attributable to systemic lidocaine must be interpreted alongside the broader prophylaxis strategy.

QoR instruments and patient-reported outcome measures integrate multiple domains, including comfort, function and emotional well-being [30]. Meta-analytic evidence suggests that systemic lidocaine may improve QoR in bariatric surgery [4], and in obese surgical patients several non-opioid adjuvants may improve recovery quality [8]. Yet QoR effects are sensitive to co-interventions and care processes; improvements in perioperative counseling, mobilization and nausea prevention may yield benefits that exceed pharmacologic additions.

A study of patients undergoing bariatric surgery within OFA versus opioid-based pathways reported broad similarities in perioperative experience, while noting potential differences during induction and perceived control in the OFA pathway [31]. Such findings suggest that analgesic strategy selection can influence patient experience in ways not fully captured by pain scores or opioid totals, and that implementation quality (communication, expectations, and supportive care) may be as important as pharmacology [32].

Implications for Current Practice: A Neutral Synthesis

From the available evidence, routine protocol-driven use of systemic lidocaine in all bariatric surgery patients is difficult to justify universally. At the same time, existing meta-analytic findings support that lidocaine can provide meaningful benefit in some settings, particularly where baseline multimodal analgesia is less intensive, opioid exposure is higher, or antiemetic prophylaxis is not optimized [4].

A pragmatic, context-aware approach is therefore reasonable. Institutions that include approaches with systemic lidocaine should define standardized dosing (including weight scalar and maximum limits), specify monitoring expectations, and address compatibility with regional anesthesia (timing, cumulative local anesthetic dosing, and LAST preparedness). In addition, a multidisciplinary program should be established to prevent chronic postsurgical pain, incorporating lidocaine as part of a preventive multimodal analgesia approach [16,17,19,20,33,34]. Patient selection may also matter: those at high risk of opioid-related respiratory depression or severe PONV could derive disproportionate benefit from any opioid-sparing effect, while patients receiving extensive co-analgesics and regional blocks may see little incremental gain.

Ultimately, the role of systemic lidocaine should be evaluated not only by statistical significance in single endpoints but by net clinical benefit within an ERAS pathway, balancing analgesia, nausea control, safety, feasibility, and patient-centered outcomes [2].

Future Directions: Toward Precision, Comparative Effectiveness, and Patient-Centered Endpoints

Several research priorities could clarify the future role of systemic lidocaine in bariatric surgery. First, exposure–response studies are needed in obesity, linking lidocaine plasma concentrations (and metabolites) to analgesic and recovery outcomes, and establishing pragmatic concentration targets that remain within safety margins. Second, comparative effectiveness trials should move beyond placebo and evaluate systemic lidocaine against other commonly used adjuvants (e.g., ketamine/esketamine, dexmedetomidine) and against regional techniques, using standardized multimodal backgrounds to isolate incremental effects.

Third, future trials should use composite outcomes that reflect real recovery priorities in bariatric surgery, integrating pain on movement, opioid-related respiratory events, PONV burden, functional milestones, and validated QoR scores. Fourth, safety should remain central: studies combining systemic lidocaine with regional anesthesia should incorporate LAST surveillance, including planned assessment of plasma concentrations and clear adjudication frameworks [15,16,19,20]. Finally, implementation research should explore how protocol adherence, clinician training, and patient communication influence outcomes, recognizing that perioperative experience and satisfaction are co-produced by pharmacology and care processes.

Conclusions

Systemic lidocaine remains a biologically plausible and potentially useful adjunct within multimodal analgesia for bariatric surgery, but its clinical value appears context dependent. Evidence suggests benefits in some trials and pooled analyses, while contemporary optimized pathways may reduce its incremental impact. In obesity, dosing uncertainty and safety considerations, particularly in combination with regional anesthesia, require careful consideration. Future work should prioritize precision dosing and patient-centered composite outcomes to define where systemic lidocaine provides in context of multimodal analgesia a benefit in modern bariatric care. In clinical practice, systemic lidocaine should be implemented within standardized institutional protocols, such as ERAS pathways, with explicit attention to safety considerations in bariatric patients.

Conflicts of Interests/Financial Disclosures

None.

Acknowledgement

This study was funded by a project grant from the Research Committee of the Kantonsspital St. Gallen (18/11).

References

1. Shafi S, Collinsworth AW, Copeland LA, Ogola GO, Qiu T, Kouznetsova M, et al. Association of Opioid-Related Adverse Drug Events With Clinical and Cost Outcomes Among Surgical Patients in a Large Integrated Health Care Delivery System. JAMA Surg. 2018 Aug 1;153(8):757–63.
2. Stenberg E, Dos Reis Falcão LF, O'Kane M, Liem R, Pournaras DJ, Salminen P, et al. Guidelines for Perioperative Care in Bariatric Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations: A 2021 Update. World J Surg. 2022 Apr;46(4):729–51.
3. Yurttas T, Djurdjevic M, Schnider TW, Filipovic M. Analgesic efficacy of systemic lidocaine using lean body mass based dosing regime versus placebo in bariatric surgery: a prospective, randomised, double-blind, placebo-controlled, single-centre study. Br J Anaesth. 2023 Jul;131(1):122–9.
4. Barbosa EC, Ortegal GHPC, Aguirre JM, Costa PRR, Ferreira LN, Moreira LF, et al. Effects of Intravenous Lidocaine on Quality of Recovery After Laparoscopic Bariatric Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Obes Surg. 2024 Jul;34(7):2663–9.
5. Weibel S, Jelting Y, Pace NL, Helf A, Eberhart LH, Hahnenkamp K, et al. Continuous intravenous perioperative lidocaine infusion for postoperative pain and recovery in adults. Cochrane Database Syst Rev. 2018 Jun 4;6(6):CD009642.
6. Vigneault L, Turgeon AF, Côté D, Lauzier F, Zarychanski R, Moore L, et al. Perfusion intraveineuse périopératoire de lidocaïne pour le contrôle de la douleur postopératoire: une méta-analyse d'études randomisées contrôlées. Can J Anaesth. 2011 Jan;58:22–37.
7. Marret E, Rolin M, Beaussier M, Bonnet F. Meta-analysis of intravenous lidocaine and postoperative recovery after abdominal surgery. Br J Surg. 2008 Nov;95(11):1331–8.
8. Carron M, Tamburini E, Linassi F, Pettenuzzo T, Boscolo A, Navalesi P. Non-Opioid Analgesics and Adjuvants after Surgery in Adults with Obesity: Systematic Review with Network Meta-Analysis of Randomized Controlled Trials. J Clin Med. 2024 Apr 3;13(7):2100.
9. Shanthanna H, Joshi GP. Opioid-free Anesthesia and Analgesia in Clinical Practice: Considerations, Techniques, and Limitations. Anesthesiology. 2025 Dec 1;143(6):1574–83.
10. Hollmann MW, Strumper D, Herroeder S, Durieux ME. Receptors, G proteins, and their interactions. Anesthesiology. 2005 Nov 1;103(5):1066–78.
11. Kaba A, Laurent SR, Detroz BJ, Sessler DI, Durieux ME, Lamy ML, et al. Intravenous lidocaine infusion facilitates acute rehabilitation after laparoscopic colectomy. Anesthesiology. 2007 Jan;106(1):11-8; discussion 5–6.
12. Licina A, Silvers A. Perioperative Intravenous Lidocaine Infusion for Postoperative Analgesia in Patients Undergoing Surgery of the Spine: Systematic Review and Meta-Analysis. Pain Med. 2022 Jan 3;23(1):45–56.
13. Lirk P, Badaoui J, Stuempflen M, Hedayat M, Freys SM, Joshi GP; et al. PROcedure-SPECific postoperative pain management guideline for laparoscopic colorectal surgery: A systematic review with recommendations for postoperative pain management. Eur J Anaesthesiol. 2024 Mar 1;41(3):161–73
14. Tang P, Sun Q, Li Z, Tong X, Chen F. Perioperative intravenous lidocaine infusion improves postoperative analgesia after hysterectomy: a systematic review and meta-analysis of randomized controlled trials. Int J Surg. 2025 Jan 1;111(1):1265–74.
15. Zhou M, Yu F, Xu Y, Wu J, Luowu L, Tang Q, et al. Combining ropivacaine transversus abdominis plane block with intravenous lidocaine infusion in adults undergoing colorectal cancer surgery: an open-label, dose-escalation exploratory trial. BMC Anesthesiol. 2025 Jul 22;25(1):357.
16. Neal JM, Barrington MJ, Fettiplace MR, Gitman M, Memtsoudis SG, Mörwald EE, et al. The Third American Society of Regional Anesthesia and Pain Medicine Practice Advisory on Local Anesthetic Systemic Toxicity: Executive Summary 2017. Reg Anesth Pain Med. 2018 Feb;43(2):113–23.
17. Weinberg G. Lipid rescue resuscitation from local anaesthetic cardiac toxicity. Toxicol Rev. 2006;25(3):139–45.

18. Gupta C, Valecha UK, Singh SP, Varshney M. Systemic lidocaine versus ultrasound-guided transversus abdominis plane block for postoperative analgesia: A comparative randomised study in bariatric surgical patients. Indian J Anaesth. 2020 Jan;64(1):31–6.

19. Weinberg GL. Treatment of local anesthetic systemic toxicity (LAST). Reg Anesth Pain Med. 2010 Mar-Apr;35(2):188–93.

20. El-Boghdadly K, Pawa A, Chin KJ. Local anesthetic systemic toxicity: current perspectives. Local Reg Anesth. 2018 Aug 8;11:35–44.

21. Yang T, Mudabbar MS, Liu B, Xu M, Fu Q. Intraoperative Esketamine Is Effective at Reducing Acute Postoperative Pain in Bariatric Surgery Patients: a Randomized Control Trial. Obes Surg. 2023 Aug;33(8):2368–74.

22. Beloeil H, Garot M, Lebuffe G, Gerbaud A, Bila J, Cuvillon P, et al. Balanced Opioid-free Anesthesia with Dexmedetomidine versus Balanced Anesthesia with Remifentanil for Major or Intermediate Noncardiac Surgery. Anesthesiology. 2021 Apr 1;134(4):541–51.

23. Clanet M, Touihri K, El Haddad C, Goldsztejn N, Himpens J, Fils JF, et al. Effect of opioid-free versus opioid-based strategies during multimodal anaesthesia on postoperative morphine consumption after bariatric surgery: a randomised double-blind clinical trial. BJA Open. 2024 Feb 23;9:100263.

24. Ao Y, Ma J, Zheng X, Zeng J, Wei K. Opioid-Sparing Anesthesia Versus Opioid-Free Anesthesia for the Prevention of Postoperative Nausea and Vomiting after Laparoscopic Bariatric Surgery: A Systematic Review and Network Meta-Analysis. Anesth Analg. 2025 Feb 1;140(2):385–96.

25. El-Boghdadly K, Desai N, Halpern S, Blake L, Odor PM, Bampoe S, et al. Quadratus lumborum block vs. transversus abdominis plane block for caesarean delivery: a systematic review and network meta-analysis. Anaesthesia. 2021 Mar;76(3):393–403.

26. Zhu GH, Hu JH, Zhuang MY, Shi HJ, Zhou F, Liu H, et al. Intravenous Lidocaine Compared with Quadratus Lumborum Block on Postoperative Analgesia Following Laparoscopic Renal Surgery: Protocol for a Randomized Noninferiority Trial. J Pain Res. 2024 Oct 24;17:3411–7.

27. Lin Z, Chen C, Xie S, Chen L, Yao Y, Qian B. Systemic lidocaine versus erector spinae plane block for improving quality of recovery after laparoscopic cholecystectomy: A randomized controlled trial. J Clin Anesth. 2024 Oct;97:111528.

28. Gan TJ, Belani KG, Bergese S, Chung F, Diemunsch P, Habib AS, et al. Fourth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting. Anesth Analg. 2020 Aug;131(2):411–48.

29. Mieszczański P, Jurczak M, Cylke R, Ziemiański P, Trzebicki J. Evidence-Based Perioperative Prevention of Postoperative Nausea and Vomiting (PONV) in Patients Undergoing Laparoscopic Bariatric Surgery: A Scoping Review. J Clin Med. 2025 Sep 29;14(19):6901.

30. Myles PS, Weitkamp B, Jones K, Melick J, Hensen S. Validity and reliability of a postoperative quality of recovery score: the QoR-40. Br J Anaesth. 2000 Jan;84(1):11–5.

31. Olausson A, Angelini E, Heckemann B, Andréll P, Jildenstål P, Thörn SE, et al. Patients' perioperative experiences of an opioid-free versus opioid-based care pathway for laparoscopic bariatric surgery: A qualitative study. Int J Nurs Stud Adv. 2024 Apr 20;6:100201.

32. Tarrant M, Khan SS, Farrow CV, Shah P, Daly M, Kos K. Patient experiences of a bariatric group programme for managing obesity: A qualitative interview study. Br J Health Psychol. 2017 Feb;22(1):77–93.

33. Sultana A, Torres D, Schumann R. Special indications for Opioid Free Anaesthesia and Analgesia, patient and procedure related: Including obesity, sleep apnoea, chronic obstructive pulmonary disease, complex regional pain syndromes, opioid addiction and cancer surgery. Best Pract Res Clin Anaesthesiol. 2017 Dec;31(4):547–60.

34. Katz J, Weinrib A, Fashler SR, Katznelzon R, Shah BR, Ladak SS, et al. The Toronto General Hospital Transitional Pain Service: development and implementation of a multidisciplinary program to prevent chronic postsurgical pain. J Pain Res. 2015 Oct 12;8:695–702.