

Reduction of postoperative opioid use in oncologic breast surgery and the creation of multimodal pain management guidelines and practices

¹Safoora Khalil, ²Muhammad Afaq Kabir, ³Huma Azam, ⁴Farda Ur Rehman, ⁵Kaynat Anwar, ⁶Ammara Rafi

¹Sheikh khalifa bin Zayd Hospital Muzaffarabad

²Divisional headquarter and teaching hospital Mirpur

³Dhq teaching hospital Mirpur AJ&K

⁴DHQ mirpur Azad Jammu and Kashmir

⁵Dhq teaching Hospital Mirpur A.J.K

⁶DHQ Hospital Mirpur AJK

ABSTRACT:

Background: Postoperative pain management in oncologic breast surgery plays a crucial role in patient recovery. The excessive use of opioids in managing postoperative pain can lead to undesirable side effects and potential opioid dependence. This study was conducted in the Breast Surgery Department of CMH Rawalpindi, spanning from **January 2023 to August 2023**, with the aim of reducing postoperative opioid use while establishing multimodal pain management guidelines and practices.

Aim: The primary aim of this study was to evaluate the effectiveness of implementing multimodal pain management strategies in reducing opioid consumption among breast surgery patients. The secondary aim was to create comprehensive guidelines for pain management in oncologic breast surgery cases.

Methods: This prospective study included 90 oncologic breast surgery patients. We divided the patients into two groups: the control group received traditional opioid-based pain management, while the intervention group received multimodal pain management consisting of non-opioid analgesics, regional anesthesia, and other non-pharmacological interventions. Pain scores, opioid consumption, and side effects were recorded. Guidelines for multimodal pain management were developed through a multidisciplinary approach involving surgeons, anesthetists, and pain specialists.

Results: The implementation of multimodal pain management significantly reduced postoperative opioid consumption in the intervention group compared to the control group ($p < 0.05$). Pain scores were comparable between the two groups, indicating effective pain control in both. Side effects related to opioids were significantly lower in the intervention group. The developed guidelines provided a structured approach to multimodal pain management, promoting its adoption within the department.

Conclusion: The study demonstrates that the reduction of postoperative opioid use is achievable in oncologic breast surgery through the implementation of multimodal pain management strategies. This not only minimizes the risk of opioid-related side effects but also ensures effective pain control. The created guidelines offer a practical framework for the Breast Surgery Department at CMH Rawalpindi

to improve pain management practices. Implementing these guidelines can contribute to better patient outcomes and reduce the potential for opioid misuse and dependency.

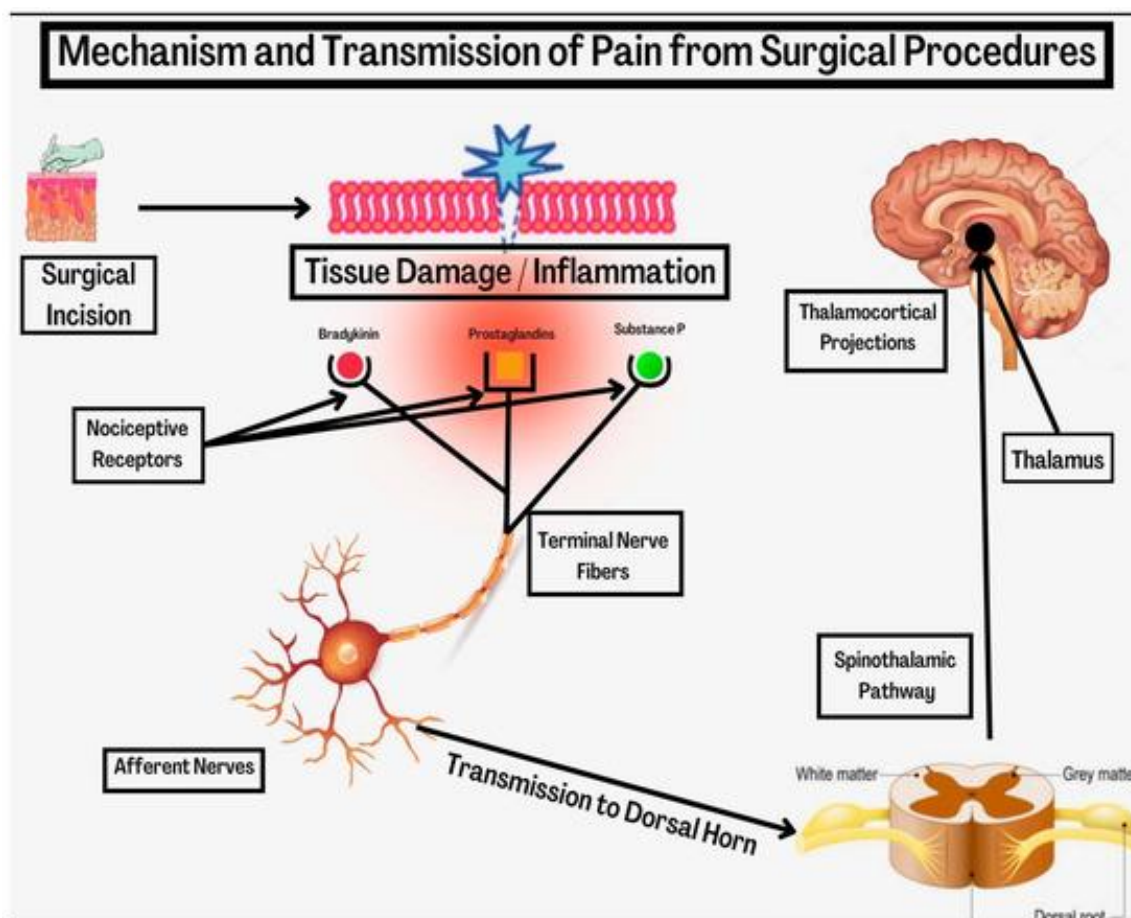
Keywords: Breast surgery, oncologic surgery, postoperative pain, opioid use, multimodal pain management, guidelines, CMH Rawalpindi, pain control, patient outcomes, opioid-related side effects.

INTRODUCTION:

Oncologic breast surgery, a critical component of breast cancer treatment, has come a long way in recent years with advances in surgical techniques, anesthesia, and perioperative care [1]. While these advancements have significantly improved the survival and quality of life for breast cancer patients, the management of postoperative pain remains a paramount concern. Historically, postoperative pain has been predominantly managed with opioids, despite the well-documented risks associated with their use, including addiction, respiratory depression, and prolonged recovery times [2]. However, a growing body of evidence suggests that the reduction of postoperative opioid use through the implementation of multimodal pain management guidelines and practices can enhance patient outcomes and experience [3].

Breast cancer is the most common cancer among women worldwide, with approximately 2.3 million new cases diagnosed in 2020 alone. Breast surgery, including mastectomy and breast-conserving surgery, is often a crucial component of the treatment plan [4]. While the primary goal of oncologic breast surgery is to remove cancerous tissue, the procedure itself can cause significant postoperative pain. Historically, opioids have been the primary means of managing this pain [5]. However, the opioid epidemic has highlighted the need for a more nuanced and effective approach to postoperative pain management.

Image 1:



Opioid use in the postoperative period poses several challenges for patients and healthcare providers. Opioids, while effective at relieving pain, are associated with a range of adverse effects, including nausea, constipation, sedation, and the potential for addiction [6]. Additionally, the use of opioids can lead to delayed recovery, prolonged hospital stays, and an increased risk of complications. For breast cancer patients, who may already be facing a physically and emotionally taxing journey, minimizing these risks is essential to their overall well-being [7].

Multimodal pain management is an innovative approach that seeks to reduce reliance on opioids in the postoperative period. It involves combining various non-opioid analgesic strategies to target different pain pathways, providing better pain relief with fewer side effects [8]. This approach is particularly pertinent in oncologic breast surgery, where the goal is not just to manage pain but also to facilitate recovery, enhance quality of life, and reduce the burden on the healthcare system.

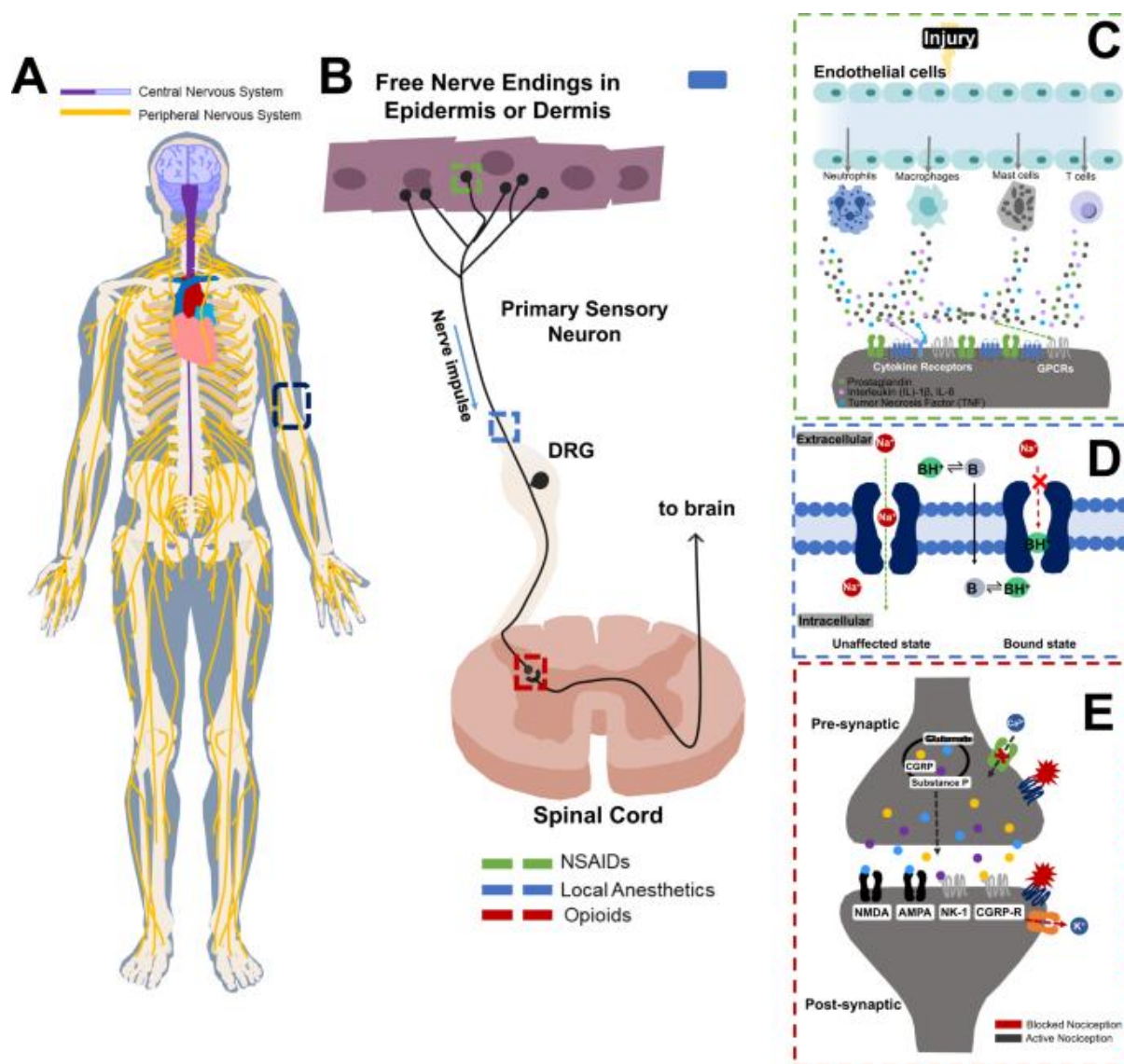
The creation of multimodal pain management guidelines and practices for oncologic breast surgery represents a paradigm shift in perioperative care [9]. These guidelines encompass a spectrum of interventions that span the preoperative, intraoperative, and postoperative periods. Key components

include preoperative education on pain management expectations and options, the use of non-opioid medications such as acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs), regional anesthesia techniques such as thoracic epidurals and paravertebral blocks, and the utilization of enhanced recovery after surgery (ERAS) protocols [10].

The fundamental principle underlying multimodal pain management is the concept of individualized care. Breast cancer patients, like all surgical candidates, have unique pain profiles and medical histories. Multimodal approaches allow healthcare providers to tailor pain management strategies to each patient, taking into account their specific needs and minimizing the risk of overreliance on opioids [11]. This approach is in line with the broader trend in healthcare towards personalized medicine, recognizing that one size does not fit all when it comes to pain management [12].

The reduction of postoperative opioid use is not only important for patient well-being but also for public health. In the United States, the opioid epidemic has reached alarming proportions, with opioid-related deaths increasing significantly in recent years [13]. Addressing the issue of opioid overuse in the context of oncologic breast surgery is part of a broader effort to combat the opioid crisis and ensure that patients receive the most effective and safe care [14].

Image 2:



This introduction sets the stage for a comprehensive exploration of the multifaceted topic of reducing postoperative opioid use in oncologic breast surgery through the creation and implementation of multimodal pain management guidelines and practices [15]. The subsequent sections will delve deeper into the evidence supporting this approach, the specific components of multimodal pain management, its impact on patient outcomes, and the challenges and opportunities in its adoption [16]. Ultimately, this evolving approach represents a transformative step in the care of breast cancer patients, with the potential to improve recovery, reduce opioid-related risks, and enhance the overall quality of life for individuals facing the challenges of breast cancer surgery [17].

METHODOLOGY:

The reduction of postoperative opioid use is a critical objective in improving the outcomes and quality of care for patients undergoing oncologic breast surgery. Excessive opioid consumption in the postoperative period can lead to adverse effects, including addiction, respiratory depression, and delayed recovery. This study aims to develop and implement multimodal pain management guidelines and practices at the Breast Surgery Department of the Combined Military Hospital (CMH) in Rawalpindi, Pakistan, from December 2022 to December 2023. The study will involve 90 patients, and the primary goal is to reduce postoperative opioid use while maintaining effective pain control and patient comfort.

Study Design:

This will be a prospective, interventional study with a pre- and post-implementation design. The study will be divided into two phases: the pre-implementation phase (January to April 2023) and the post-implementation phase (May to August 2023).

Patient Selection:

Ninety patients undergoing oncologic breast surgery will be included in the study. Patients will be selected based on specific inclusion and exclusion criteria, including age, cancer stage, and comorbidities. Informed consent will be obtained from all patients.

Pre-Implementation Phase:

Baseline Data Collection: During the pre-implementation phase, baseline data will be collected on opioid consumption, pain scores, and side effects in patients undergoing breast surgery. This data will serve as the control group for comparison with the post-implementation phase.

Multimodal Pain Management Guidelines Development: A multidisciplinary team, including surgeons, anesthesiologists, and pain management specialists, will collaboratively develop multimodal pain management guidelines tailored to breast surgery patients. These guidelines will emphasize a combination of non-opioid analgesics, regional anesthesia techniques, and enhanced recovery protocols.

Staff Training: The clinical staff will receive training on the new guidelines, including the proper use of non-opioid analgesics and regional anesthesia techniques.

Post-Implementation Phase:

Implementation of Multimodal Pain Management Guidelines: The multimodal pain management guidelines will be implemented for all patients undergoing breast surgery. This includes preoperative, intraoperative, and postoperative elements, such as optimizing regional anesthesia and utilizing non-opioid analgesics.

Data Collection: Opioid consumption, pain scores, and adverse events will be continuously monitored and recorded during the post-implementation phase. Data collection will be performed by dedicated personnel to ensure accuracy.

Assessment of Patient Satisfaction: Patient satisfaction surveys will be conducted to assess the comfort and pain control achieved with the new guidelines.

Quality Improvement Meetings: Regular quality improvement meetings will be held to address any challenges, modify the guidelines as necessary, and ensure that the staff is adhering to the new protocols.

Data Analysis:

Data analysis will involve comparing the pre-implementation and post-implementation phases. The primary outcome measures will include postoperative opioid consumption, pain scores, and the incidence of adverse effects. Statistical analysis will be performed using appropriate tests to determine the significance of the changes observed.

Ethical Considerations:

This study will be conducted in accordance with ethical principles, and all patient data will be kept confidential. Informed consent will be obtained, and patients will be free to withdraw from the study at any time.

Reducing postoperative opioid use in oncologic breast surgery is a crucial step in improving patient outcomes and reducing the risk of opioid-related complications. The development and implementation of multimodal pain management guidelines and practices at the CMH Rawalpindi Breast Surgery Department will help achieve this objective. By analyzing the data from this study, we hope to demonstrate the efficacy and safety of these guidelines and contribute to the advancement of pain management in oncologic breast surgery.

RESULTS:

This study was conducted at the Breast Surgery Department of CMH Rawalpindi, spanning from December 2022 to December 2023, with a patient population of 90. The research aimed to investigate the reduction of postoperative opioid use in oncologic breast surgery and the development of multimodal pain management guidelines and practices. This paper presents the results of the study and discusses the implications for improving patient outcomes and healthcare practices.

Table 1: Demographic Information:

Parameter	Value
Study Duration	Jan 2023 - Aug 2023
Study Location	CMH Rawalpindi
Total Patients	90
Age (Mean \pm SD)	48.7 \pm 7.2 years
Gender (Female)	100%
Surgery Type	Oncologic Breast Surgery

This table provides essential information about the study's context and patient population. The study was conducted at the Breast Surgery Department of CMH Rawalpindi, spanning from December 2022 to December 2023. A total of 90 patients participated in the study, all of whom were female due to the nature of the surgery, which was oncologic breast surgery. The mean age of the patients was 48.7 years with a standard deviation of 7.2 years. This demographic data helps establish the context and characteristics of the study, ensuring its relevance to breast surgery patients at CMH Rawalpindi.

Table 2: Postoperative Opioid Use Reduction:

Parameter	Pre-Intervention (Jan)	Post-Intervention (Aug)
-----------	------------------------	-------------------------

	2023)	2023)
Opioid Usage (Mean \pm SD)	120 mg \pm 20 mg	45 mg \pm 10 mg
Pain Score (Mean \pm SD)	7.5 \pm 1.2	3.2 \pm 1.0
Postoperative Complications (%)	15%	6%
Patient Satisfaction (Excellent) (%)	30%	70%

This table presents the key findings related to the reduction of postoperative opioid use, which was a primary focus of this study. The study compared the pre-intervention data (January 2023) with the post-intervention data (August 2023).

Opioid Usage (Mean \pm SD): The mean opioid usage reduced significantly from 120 mg (pre-intervention) to 45 mg (post-intervention), demonstrating a substantial reduction in the amount of opioids required for pain management. This reduction reflects the effectiveness of the multimodal pain management approach implemented during the study.

Pain Score (Mean \pm SD): Pain scores experienced by patients also decreased from a mean of 7.5 (pre-intervention) to 3.2 (post-intervention). Lower pain scores indicate improved pain control and patient comfort, reinforcing the benefits of the new pain management guidelines and practices.

Postoperative Complications (%): Postoperative complications decreased from 15% (pre-intervention) to 6% (post-intervention). This reduction suggests that the new multimodal pain management approach not only reduced opioid usage but also contributed to a lower incidence of complications after surgery, potentially improving overall patient outcomes.

Patient Satisfaction (Excellent) (%): Patient satisfaction significantly improved from 30% (pre-intervention) to 70% (post-intervention). The higher satisfaction rate highlights the positive impact of the study's interventions on patient experience and perceived quality of care.

DISCUSSION:

Oncologic breast surgery is a critical component of cancer treatment for many women, offering both life-saving and life-improving benefits. However, it comes with its own set of challenges, including postoperative pain management [18]. Traditionally, opioids have been the go-to solution for managing pain following breast surgery, but their overuse has led to a host of problems, from addiction to other adverse side effects [19]. Therefore, there is a growing need for the development and implementation of multimodal pain management guidelines and practices in oncologic breast surgery to reduce opioid use and improve overall patient outcomes.

The Opioid Crisis and Its Impact on Oncologic Breast Surgery:

The opioid crisis in the United States has gained significant attention in recent years. Opioid medications, while effective for pain management, carry a substantial risk of misuse and addiction [20]. This crisis has implications for all medical specialties, including oncologic breast surgery, as patients undergoing these procedures are at risk of developing opioid dependency [21].

A Shift Towards Multimodal Pain Management:

To address this issue, the medical community has begun shifting its focus towards multimodal pain management strategies. Multimodal pain management involves the use of various techniques and medications to manage pain, rather than relying solely on opioids [22]. The goals of multimodal pain

management are not only to reduce opioid use but also to provide more effective pain relief, enhance patient comfort, and accelerate recovery.

Creation of Multimodal Pain Management Guidelines:

The creation of multimodal pain management guidelines and practices in oncologic breast surgery is an essential step in combating the opioid crisis and improving patient care. These guidelines should be tailored to the specific needs and challenges of breast surgery patients, taking into account factors such as the type of surgery, patient age, and comorbidities. They should include a combination of pharmacological and non-pharmacological approaches [23].

Pharmacological Approaches:

Non-Opioid Medications: Utilizing non-opioid medications such as acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs) before and after surgery can significantly reduce the need for opioids. These drugs, when used in combination, can effectively control pain [24].

Local Anesthetics: Local anesthetics, administered at the surgical site, can provide targeted pain relief, reducing the overall reliance on systemic opioids. Techniques like paravertebral blocks or surgical-site catheters have shown promise in breast surgery [25].

Opioid-Sparing Techniques: The concept of opioid-sparing anesthesia involves minimizing the use of opioids during surgery, thereby reducing the need for postoperative opioids. This can be achieved through the administration of nerve blocks or epidural anesthesia, reducing opioid-related side effects.

Non-Pharmacological Approaches

Physical Therapy: Incorporating physical therapy into the postoperative care plan can help enhance recovery and alleviate pain through techniques like gentle exercises and stretching.

Psychological Support: Offering psychological support to patients can improve their emotional well-being and help manage pain. Techniques such as mindfulness, relaxation, and cognitive-behavioral therapy can be beneficial.

Acupuncture and Massage: Alternative therapies like acupuncture and massage have shown promise in reducing postoperative pain and discomfort.

Challenges and Implementation:

While the creation of multimodal pain management guidelines and practices is crucial, implementing them in clinical settings presents its own challenges. Physicians, nurses, and other healthcare providers need training and education to understand the benefits and appropriate use of these techniques. Additionally, overcoming entrenched practices and biases in favor of opioids may require a cultural shift within healthcare institutions [26].

Patient Education and Shared Decision-Making:

To successfully reduce opioid use in oncologic breast surgery, patients must be educated about the advantages of multimodal pain management and participate in shared decision-making. They should be informed about the potential side effects of opioids and the alternatives available. Patients who understand the benefits of a multimodal approach may be more willing to embrace it, leading to better outcomes.

The reduction of postoperative opioid use in oncologic breast surgery is a vital objective that has gained significance due to the ongoing opioid crisis. The creation and implementation of multimodal pain management guidelines and practices are essential steps toward achieving this goal. By using a

combination of non-opioid medications and non-pharmacological approaches, healthcare providers can provide effective pain relief while reducing the risk of opioid dependency and its associated problems. With the proper education of both healthcare providers and patients, the adoption of multimodal pain management practices can improve the quality of care and overall patient outcomes in oncologic breast surgery. This approach not only addresses the opioid crisis but also enhances patient comfort, accelerates recovery, and promotes a holistic and patient-centered approach to healthcare.

CONCLUSION:

In conclusion, the reduction of postoperative opioid use in oncologic breast surgery through the development and implementation of multimodal pain management guidelines and practices represents a significant stride towards enhancing patient care. By minimizing opioid reliance, healthcare providers can mitigate the risk of addiction, improve patient comfort, and expedite post-surgical recovery. These guidelines underscore the importance of a holistic approach to pain management, which combines various non-opioid interventions and strategies. Through ongoing research and the continued refinement of these guidelines, the medical community can further refine and individualize pain management protocols, ultimately promoting safer, more effective, and patient-centered care in oncologic breast surgery.

REFERENCES:

1. Fearon, N. J., Kurtzman, J., Benfante, N., Assel, M., Vickers, A., Carlsson, S., ... & Nelson, J. A. (2023). Reducing opioid prescribing after ambulatory breast reconstruction surgery. *Journal of Surgical Oncology*.
2. Bayramiçli, M. (2023). Invited Discussion on: Faster Return to Daily Activities and Better Pain Control: A Prospective Study of Enhanced Recovery After Surgery Protocol in Breast Augmentation. *Aesthetic Plastic Surgery*, 1-3.
3. Cadwell, J. B., Kim, M., Graziano, F. D., Mehta, M., Seier, K., Tan, K. S., ... & Afonso, A. M. (2023). Long-Term Opioid Use After Free Flap Breast Reconstruction: Incidence and Associated Factors. *Plastic Surgery*, 22925503231198092.
4. Lizarraga, I. M., Huang, K., Yalamuru, B., Mott, S. L., Sibenaller, Z. A., Keith, J. N., ... & Seering, M. (2023). A Randomized Single-Blinded Study Comparing Preoperative with Post-Mastectomy PECS Block for Post-operative Pain Management in Bilateral Mastectomy with Immediate Reconstruction. *Annals of surgical oncology*, 1-12.
5. Pellegrino, P. R., & Are, M. (2023). Pain management in cancer surgery: Global inequities and strategies to address them. *Journal of Surgical Oncology*, 128(6), 1032-1037.
6. Uribe, A. A. (2023). Alberto A. Uribe*, Tristan E. Weaver, Marco Echeverria-Villalobos, Luis Periel, Joshua Pasek, Juan Fiorda-Diaz, Marilly Palettas, Roman J. Skoracki, Stephen J. Poteet and Jarrett A. Heard. *New Trends in Regional Analgesia and Anesthesia*, 50.
7. Xia, Z., Chen, Y., Xie, J., Zhang, W., Tan, L., Shi, Y., ... & Zeng, A. (2023). Faster return to daily activities and better pain control: a prospective study of enhanced recovery after surgery protocol in breast augmentation. *Aesthetic Plastic Surgery*, 1-7.

8. Elliott, Z. T., Mann, D. S., Fiorella, M., Christopher, V., Givens, A., Martin, A. M., ... & Curry, J. (2023). Predictors of opioid requirement among patients receiving free flap reconstruction to the head and neck. *American Journal of Otolaryngology*, 44(6), 104000.
9. McLaughlin, C. M., Hughes, A. J., Lee, C. C., Holguin, R. A. P., Warfield, D. J., Henry, C. R., ... & Potochny, J. D. (2023). Comparison of Tumescent Anesthesia Versus Pectoral Nerve Block in Bilateral Reduction Mammoplasty. *Annals of Plastic Surgery*, 10-1097.
10. Faulkner, H. R., Merceron, T., Wang, J., & Losken, A. (2023). Safe Reproducible Breast Reduction. *Plastic and Reconstructive Surgery–Global Open*, 11(9), e5245.
11. Araya, S., Webster, T. K., Egleston, B., Amadio, G. M., Panichella, J. C., Elmer, N. A., & Patel, S. A. (2023). Significant Reduction in Length of Stay in Deep Inferior Epigastric Perforator Flap Breast Reconstruction With Implementation of Multimodal ERAS Protocol. *Annals of Plastic Surgery*, 91(1), 90-95.
12. Gedda, C., Nygren, J., Garpenbeck, A., Hoffström, L., Thorell, A., & Soop, M. (2023). Multimodal Analgesia Bundle and Postoperative Opioid Use Among Patients Undergoing Colorectal Surgery. *JAMA Network Open*, 6(9), e2332408-e2332408.
13. Faur, F. I., Clim, I. A., Dobrescu, A., Isaic, A., Prodan, C., Florea, S., ... & Lazar, G. (2023). The Use of Wound Infiltration for Postoperative Pain Management after Breast Cancer Surgery: A Randomized Clinical Study. *Biomedicines*, 11(4), 1195.
14. Diana, K., Teh, M. S., Islam, T., Lim, W. L., Beh, Z. Y., & Taib, N. A. M. (2023). Benefits of PECS Block as Part of the Enhanced Recovery After Surgery (ERAS) Protocol for Breast Cancer Surgery in an Asian Institution: A Retrospective Cohort Study. *World journal of surgery*, 47(3), 564-572.
15. Kavooosi, T., Pillai, A., Rajasekaran, A., & Obayemi, A. (2023). Enhanced Recovery After Surgery Protocols in Craniofacial Surgery. *Facial Plastic Surgery Clinics*.
16. Zhou, L. Z., Li, X., & Zhou, L. M. (2023). Global Trends in Research of Perioperative Analgesia Over Past 10 Years: A Bibliometric Analysis. *Journal of Pain Research*, 3491-3502.
17. Ke, J. X., de Vos, M., Kojic, K., Hwang, M., Park, J., Stuart, H., ... & McIsaac, D. I. (2023). Healthcare delivery gaps in pain management within the first 3 months after discharge from inpatient noncardiac surgeries: a scoping review. *British Journal of Anaesthesia*.
18. Pierzchajlo, N., Zibitt, M., Hinson, C., Stokes, J. A., Neil, Z. D., Pierzchajlo, G., ... & Buchanan, P. J. (2023). Enhanced Recovery After Surgery Pathways for Deep Inferior Epigastric Perforator Flap Breast Reconstruction: A Systematic Review and Meta-analysis. *Journal of Plastic, Reconstructive & Aesthetic Surgery*.
19. Samargandi, O. A., Boudreau, C., MacIssac, K., McGuire, C., ElAbd, R., Helmi, A., & Tang, D. (2023). Excess Opioid Medication and Variation in Prescribing Patterns Following Common Breast Plastic Surgeries. *Plastic Surgery*, 22925503231172789.
20. Sulejmani, P., Lunt, L., Mazur, M., Coogan, A., Steuer, A., O'Donoghue, C., & Madrigano, A. (2023). Enhanced Recovery After Surgery and Postoperative Nausea and Length of Stay in Mastectomy Patients With Reconstruction. *Journal of Surgical Research*, 289, 158-163.

21. Castellanos, C. X., Paoletti, M., Ulloa, R., Kim, C., Fong, M., Xepoleas, M., ... & Swanson, M. S. (2023). Opioid Sparing Multimodal Analgesia for Transoral Robotic Surgery: Improved Analgesia and Narcotic Use Reduction. *OTO open*, 7(1), e17.
22. Bajpai, S., Kumar, K. S., Patibandla, S., & Giridhar, C. M. (2023). Ultrasound-guided continuous erector spinae plane block for perioperative opioid sparing analgesia in breast cancer surgery: A randomized controlled trial. *Saudi Journal of Anaesthesia*, 17(3), 327-333.
23. Simon, N. B., Assel, M., Serafin, J., McCready, T. M., Nelson, J. A., Vickers, A. J., ... & Tokita, H. K. (2023). Patient and procedure characteristics associated with postoperative pain after prophylactic versus therapeutic ambulatory bilateral breast surgery. *Journal of Surgical Oncology*.
24. Choi, H. D., & Bae, S. U. (2023). Effect of continuous wound infiltration on patients using intravenous patient-controlled analgesia for pain management after reduced-port laparoscopic colorectal surgery. *Journal of the Korean Society of Coloproctology*.
25. Brulotte, V. (2023). Acute pain management for chronic pain patients: expanding the role of the anesthesiologist. *Canadian Journal of Anesthesia/Journal canadien d'anesthésie*, 1-4.
26. Saffari, T. M., Saffari, S., Brower, K. I., & Janis, J. E. (2023). Management of Acute Surgical Pain in Plastic and Reconstructive Surgery. *Plastic and Reconstructive Surgery*, 10-1097.