PERFECTING THE SURGICAL JOURNEY

ERAS CARDIAC

THE **PAIN AND MOBILITY** ISSUE

NEWSLETTER

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OPIOID-SPARING OPIOIDS

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Opioids have been shown to provide their greatest value when given in the lowest effective dose for the shortest duration possible after the use of all alternative non-opioids has been exhausted. Individual opioid stewardship, defined as "the judicious use of opioids to treat surgical pain and optimize postoperative patient outcomes," coupled with concerns regarding opioid-related adverse events (ORADEs) and the potential for persistent postoperative opioid use (POU), has increasingly led providers to seek opioid avoidance.[1] However, as the recent ERAS-Cardiac/POQI joint consensus statement states, this restrictive approach is actually a misinterpretation of opioid stewardship. Rather, the goal of opioid stewardship is to utilize opioids, where appropriate, to ensure patient comfort and functional recovery, and actually cautions against the rote reduction of opioids,

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MODIFIABLE BARRIERS TO EARLY MOBILIZATION

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46% of patients who undergo cardiac surgery will develop intensive care unit-acquired weakness (ICU AW) during their stay, characterized by muscular atrophy, myopathy, and polyneuropathy. [1] ICU AW can prolong immobilization and inhibit long-term physical function. Prolonged bed rest should be avoided, and early mobilization promoted. Early mobilization (EM) after cardiac surgery prevents immobilization-related complications and improves patient care outcomes. EM is an

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PAIN MANAGEMENT OUTCOMES FOLLOWING CRYO NERVE BLOCK IN LEFT THORACOTOMY CORONARY ARTERY BYPASS GRAFT SURGERY

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Adequate pain management using a multimodal pain management approach for patients undergoing cardiac surgery is vital for enhanced patient recovery from a major traumatic surgery.[1] The FROST clinical trial reported improved early FeV1 outcomes in minimally invasive thoracotomy heart valve surgery for patients receiving Cryo Nerve Block (cryoNB).[2] CryoNB temporarily blocks intercostal nerves resulting in the patient experiencing a sensation of numbness at the incision site to mitigate post-operative pain as part of a multi-modal analgesia strategy. However, questions remain regarding post-operative persistence of pain, skin numbness, and hypersensitivity.

In our recent study published in Reviews in Cardiovascular Medicine, we investigated the effectiveness of cryoNB on postoperative pain in consecutive patients undergoing isolated coronary artery bypass graft (CABG) through left thoracotomy by a single surgeon between July 2021 and July 2022.[3] Sixty patients who received

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MULTIMODAL ANALGESIA

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Pain is an inevitable outcome after surgery, but remains a challenge. High levels of post-operative pain and long pain duration have been identified as risk factors for developing chronic pain following ICU discharge.[1,2] Traditionally, opioids have been a mainstay of pain management due to their reliable analgesic effects. However, they do not come without risk: oversedation, respiratory depression, ileus, opioid induced hyperalgesia to name a few, all of which can lead to complications and increase length of stay. One of the most notable consequences of routine opioid use is that consistent opioid use as early as 5-7 days increases the probability of chronic opioid use.[3] As such, utilizing multimodal analgesia has become increasingly supported by guidelines as opioid-sparing strategies.[2] Acetaminophen demonstrates

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MORE **INSIDE:**

OPIOID-SPARING OPIOIDS

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particularly when it compromises optimal pain management.[1] Therefore, opioids can (and in certain situations, should) be a key aspect of perioperative pain management.

Providers traditionally favor short-acting opioids, which are associated with relatively immediate pain relief and are easily titrated. Unfortunately, short and ultra-short acting forms (i.e., fentanyl and remifentanil),[2] are increasingly recognized for their potential to induce acute tolerance and hyperalgesia. As a result, subsequent opioid dosing is rapidly escalated to either achieve similar pain control (tolerance) or at the risk of unintentionally contributing to greater pain sensitivity (hyperalgesia). These effects are notoriously unpredictable, and escalating doses of even short acting opioids only heighten the risk of ORADEs as well increase the likelihood of POU. Alternatively, there are several studies that suggest that the pre-emptive use of long-acting opioids may both limit the use of shorter-acting opioids as well as reduce the absolute amount of opioid administered in the early postoperative period.

Pre-incisional methadone has been studied for this purpose. A recent randomized controlled study compared the use of intravenous methadone (0.3 mg/kg) to fentanyl (12 mcg/kg) for cardiac surgery. Patients who received methadone required less total opioid and experiences lower pain scores for 24 hours after surgery.[3] Follow up at month showed lower pain scores in the methadone group as well. A systematic review concluded that 0.1-0.3 mg/kg of methadone significantly reduces postoperative opioids and pain scores compared to shorter-acting alternatives such as morphine or fentanyl.[4] Intrathecal morphine (5 mcg/kg) was studied in much the same fashion, with a recent RCT showing its use is associated with marked reduction in overall opioid exposure at both 24 and 48 hours timepoints after surgery as well as lower pain scores.[5] Methadone and intrathecal morphine do not appear to contribute to greater instances of ORADEs, though some consideration is required in regards to modifying dosing based on age and comorbidity. It is likely that older patients would benefit from reduced dosing of either agent and, particularly in the case of intrathecal morphine, there is a greater likelihood of postoperative nausea and vomiting (PONV), which may require more concerted application of targeted PONV prevention strategies.

Importantly, methadone and intrathecal morphine, as opioid-sparing opioids, require providers to reduce the use of alternative opioids during surgery and appear to reduce the need for rescue opioids, particularly in institutions that rely heavily upon opioids as first or second-line agents for pain or early postoperative agitation. Thier use may be less beneficial in programs that already utilize low-dose synthetic opioid regimens (i.e., fentanyl < 6 mcg/kg/ surgery). Opioid stewardship entails the judicious use opioids, balancing the benefits of optimal analgesia against side effects and risks of opioid use. The use of preemptive long-acting opioids is one potential strategy to achieve this laudable goal.

THE GOAL OF OPIOID STEWARDSHIP IS TO UTILIZE OPIOIDS, WHERE APPROPRIATE, TO ENSURE PATIENT COMFORT AND FUNCTIONAL RECOVERY, AND ACTUALLY CAUTIONS AGAINST THE ROTE REDUCTION OF OPIOIDS, PARTICULARLY WHEN IT COMPROMISES OPTIMAL PAIN MANAGEMENT.

1. Grant MC, Chappell D, Gan TJ, Manning MW, Miller TE, Brodt JL; PeriOperative Quality Initiative (POQI) and the Enhanced Recovery After Surgery (ERAS) Cardiac Society Workgroup. Pain management and opioid stewardship in adult cardiac surgery: Joint consensus report of the PeriOperative Quality Initiative and the Enhanced Recovery After Surgery Cardiac Society. J Thorac Cardiovasc Surg. 2023 Dec;166(6):1695-1706.e2.

2. Colvin LA, Bull F, Hales TG. Perioperative opioid analgesia-when is enough too much? A review of opioid-induced tolerance and hyperalgesia. Lancet. 2019; 393:1558-1568.

3. Murphy GS, Szokol JW, Avram MJ, Greenberg SB, Marymont JH, Shear T, Parikh KN, Patel SS, Gupta DK. Intraoperative Methadone for the Prevention of Postoperative Pain: A Randomized, Double-blinded Clinical Trial in Cardiac Surgical Patients. Anesthesiology. 2015;122(5):1112-22.

4. Lobova VA, Roll JM, Roll MLC. Intraoperative Methadone Use in Cardiac Surgery: A Systematic Review. Pain Med. 2021;22(12):2827-2834.

5. Dhawan R, Daubenspeck D, Wroblewski KE, Harrison JH, McCrorey M, Balkhy HH, Chaney MA. Intrathecal Morphine for Analgesia in Minimally Invasive Cardiac Surgery: A Randomized, Placebo-controlled, Double-blinded Clinical Trial. Anesthesiology. 2021;135(5):864-876.

PAIN MANAGEMENT OUTCOMES FOLLOWING CRYO NERVE BLOCK IN LEFT THORACOTOMY CORONARY ARTERY BYPASS GRAFT SURGERY

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cryoNB were propensity-score matched and compared with 43 patients not treated with cryoNB. Clinical outcomes, post-operative pain, skin hypersensitivity, and persistence of skin numbness were assessed. Mean follow-up was 5.7 months.

There were no significant intra-operative or post-operative surgical outcome differences between the two groups, including length of stay (LOS). Our raw numbers suggest a decrease in opioid consumption with utilization of cryoNB, however, our numbers are small and not statistically significant (see Table 1). On pain scales 0 to 10, pain was mean 1.5 at discharge and 0.69 at follow-up in CryoNB-treated patients. Skin numbness at discharge and follow-up were means 1 and 0.57; hypersensitivity at discharge and follow-up were means 1.1 and 0.9. Overall, we achieved excellent pain management with the potential to reduce opioid consumption by utilizing cryo nerve blocks in patients undergoing mini-left thoracotomy for minimally invasive coronary surgery.

1. Engelman DT, et al. JAMA Surg. 2019;154(8):755–766.

2. Lau WC, et al. Pain and Therapy. 2021;10:1579–1592.

3. Dokollari A, et al. Rev Cardiovasc Med. 2023;24(6):182.

OVERALL, WE ACHIEVED EXCELLENT PAIN MANAGEMENT WITH THE POTENTIAL TO REDUCE OPIOID CONSUMPTION BY UTILIZING CRYO NERVE BLOCKS IN PATIENTS UNDERGOING MINI-LEFT THORACOTOMY FOR MINIMALLY INVASIVE CORONARY SURGERY.

Pain Questionnaires Outcomes	cryoNB patients N=60 mean values
Pain at discharge (scale 0–10)	1.5
Pain at follow-up (scale 0–10)	0.69
Skin numbness at discharge (scale 0–10)	1
Skin numbness at follow-up (scale 0–10)	0.57
Skin hypersensitivity at discharge (scale 0–10)	1.1
Skin hypersensitivity at follow-up (scale 0–10)	0.9
Pain affecting sleep at discharge (scale 0–10)	0.34
Pain affecting sleep at follow-up (scale 0–10)	0.34
Pain affecting breathing at discharge (scale 0–10)	0.34
Pain affecting breathing at follow-up (scale 0–10)	0.34
Pain with movement at discharge (scale 0–10)	1.15

Table 1: Study Outcomes for Pain and In-Hospital Opioid Consumption. Table adapted from Dokollari A, et al. Rev Cardiovasc Med. 2023;24(6):182 with permission via CC BY 4.0 license.

In-hospital drugs use	cryoNB N=60	Non-cryoNB N=40	Reduction in opioid consumption in the cryoNB cohort
Post-operative IV morphine equivalent dos, mg	53.8 ± 54.9	83.8 ± 95.9	36%
Total IV morphine equivalent dose mg	73.8 + 79.37	144.1 + 118.99	49%

IV: intravenous; intraoperative was fentanyl + ketorolac; post-operative was hydromorphone + oxycodone; total IV was fentanyl+hydromorphone+oxycodone

MODIFIABLE BARRIERS TO EARLY MOBILIZATION

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essential element and an effective intervention for enhanced recovery.[2] There are multiple benefits to early mobilization: an increase in oxygen transport and functional capacity healing, a decrease in post-op complications (pneumonia, atelectasis, delirium, and more), a shorter ICU and hospital length of stay, and reduced cost.[1,3,4]

Although EM of patients in the intensive care unit is important, there is still heterogeneity in EM protocols, and routine implementation can be challenging. Various barriers may be present, some of which are patient-related and non-modifiable, such as delirium, obesity, hemodynamic instability, and arrhythmia. Others, like intensive care unit culture and process-related barriers need exploration, and strategies must be developed to overcome these challenges.[5] One structural barrier is the absence of a standard EM protocol. This can lead to difficulties in identifying eligible patients and contribute to nurses' insecurity in mobilizing their patients. It is essential to develop a nurse-driven protocol with safety criteria in collaboration with a physical therapist and intensivist.

Secondly, the lack of a mobility culture represents an intensive care cultural barrier. There might be a perception that EM is not a priority, however, mobilization is as important as medication administration. Early mobilization should be integrated into the daily plan of care and implemented as a standard metric. If there is a lack of staff knowledge and expertise, immobilization could be more prevalent. Multiprofessional education and training could help decrease the gap between knowledge and practice and provide information on the benefits versus risks of mobilization. Additionally, the presence of champions on different shifts who demonstrate that EM is safe and beneficial will positively influence the rest of the team. Finally, because EM in the ICU requires the help of two professionals, unclear roles/responsibilities and expectations can represent a process-related barrier. Interprofessional communication and cooperation toward the mobilization goal are needed.

Early mobilization in the ICU is a complex intervention but safe, feasible, and beneficial for optimal recovery.

INTENSIVE CARE UNIT CULTURE AND PROCESS-RELATED BARRIERS NEED EXPLORATION, AND STRATEGIES MUST BE DEVELOPED TO OVERCOME THESE EARLY MOBILIZATION (EM) CHALLENGES

1. Chen, B., Xie, G., Lin, Y., Chen, L., Lin, Z., You, X., Xie, X., Dong, D., Zheng, X., Li, D., Lin, W. (2021). A systematic review and meta-analysis of the effects of early mobilization therapy in patients after cardiac surgery. Medicine, 100(15), 1-11.

2. Engelman, D.T., Ben Ali, W., Williams, J.B., Perrault, L.P., Reddy, V.S., Arora, R.C., Roselli, E.E., Khoynezhad, A., Gerdisch, M., Levy, J.H., Lobdell, K., Fletcher, N., Kirsch, M., Nelson, G., Engelman, R.M., Gregory, A.J. & Boyle, E.M. (2019). Guidelines for perioperative care in cardiac surgery Enhanced recovery after surgery society recommendations. Journal of American Medical Association Surgery, 154(8), 755-766.

3. Barbosa Borges, M.G., Lago Borges, D., Oliveira Ribeiro, M., Silva Lima, L.S., Morais Macedo, K.C., Da Silva Nina, V.J. (2022). Early mobilization prescription in patients undergoing cardiac surgery: systematic review. Brazilian Journal of Cardiovascular Surgery, 37(2), 227-238.

4. Santos, P.M.R., Ricci, N.A., Suster, É.A.B., Paisani, D.M. & Chiavegato, L.D. (2017). Effects of early mobilisation in patients after cardiac surgery: a systematic review. Physiotherapy, 103, 1-12.

5. Dubb, R., Nydahl, P., Hermes, C., Schwabbauer, N., Toonstra, A., Parker, A.M., Katwasser, A. & Needham, D.M. (2016). Barriers and strategies for early mobilization of patients in intensive care units. Annals of the American Thoracic Society, 13(5), 724-730.

MULTIMODAL ANALGESIA

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synergy when used in combination with opioids, resulting in decreased opioid requirements in both surgical and trauma patients. Intravenous (IV) acetaminophen bypasses gut absorption, has a quicker onset of action, and higher peak concentration. Notably, the intravenous form of acetaminophen has not been demonstrated to be superior to oral acetaminophen in terms of a reduction in opioid requirements.[1] Pertinent past medical history can help target post-operative multimodal pain strategies. For example, patients with known neuropathies may benefit more from GABAnergic or antidepressant drugs. However, renal dysfunction and advanced age may pre-dispose patients to oversedation and delirium with GABAnergic agents. Subanesthetic ketamine dosing (0.1 to 0.4 mg/kg IV) has been shown to decrease opioid requirement and valuable in patients with opioid-induced hyperalgesia but can exhibit psychomimetic adverse effects such as emergence reactions at anesthetic dosing; careful attention must be paid to titration increments to avoid these undesired effects.[1] In addition to pharmacologic agents, multiple regional anesthetic techniques are currently being investigated as adjunctive therapy for perioperative multimodal analgesia in cardiac surgery.[4] At this time there is no universally standard algorithm for multimodal analgesia, and careful consideration of individual patient and operative factors can help guide the optimal opioid-sparing strategy.

1. Kaye AD, Cornett EM, Helander E, et al. An update on nonopioids: intravenous or oral analgesics for perioperative pain management. Anesthesiol Clin. 2017;35(2):e55-e71

2. Devlin, J.W. et al. (2018) 'Clinical practice guidelines for the prevention and management of pain, agitation/ sedation, delirium, immobility, and sleep disruption in adult patients in the ICU', Critical Care Medicine, 46(9). doi:10.1097/ ccm.0000000000003299.

3. Characteristics of initial prescription episodes and likelihood of long-term opioid use - United States, 2006–2015 (2017) Centers for Disease Control and Prevention.

4. Grant MC, Chappell D, Gan TJ, Manning MW, Miller TE, Brodt JL; PeriOperative Quality Initiative (POQI) and the Enhanced Recovery After Surgery (ERAS) Cardiac Society Workgroup. Pain management and opioid stewardship in adult cardiac surgery: Joint consensus report of the PeriOperative Quality Initiative and the Enhanced Recovery After Surgery Cardiac Society. J Thorac Cardiovasc Surg. 2023 Dec;166(6):1695-1706.e2. doi: 10.1016/j.jtcvs.2023.01.020. Epub 2023 Jan 28. PMID: 36868931.

COACHES CORNER

ERAS PROGRAM IN THE SPOTLIGHT

University of MD St Joseph Medical Center Mobility Protocol

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2 hours after extubation, dangle on side of bed then OOB to chair

Ambulate at least 3 times a day beginning POD 1

Progress to walking independently

AMBULATE

- on vasopressors and/or inotropes
- Afib < 130 bpm
- PA Catheter in place

CONTRAINDICATION TO AMBULATION

- Hemodynamic Instability
- Open Chest
- Femoral IABP
- Central ECMO Cannulation

KEEP YOUR MOVE IN THE TUBE© ACTIVITY PROGRAM

Rachel Born PT, DPT
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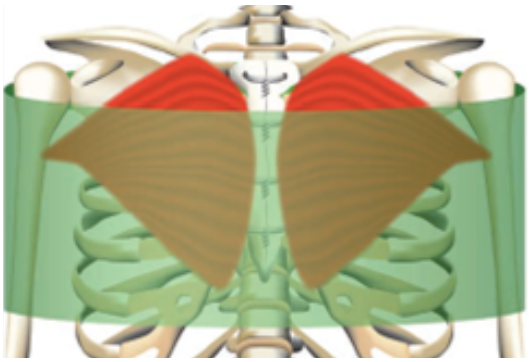
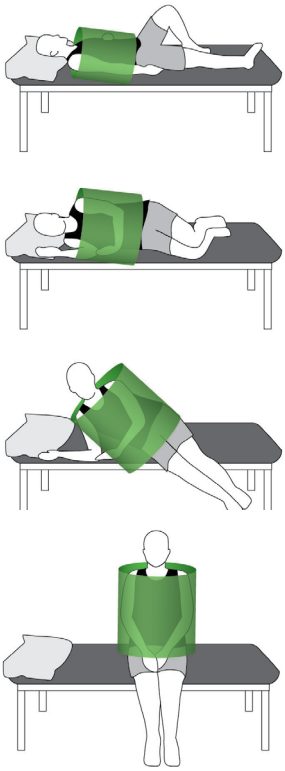


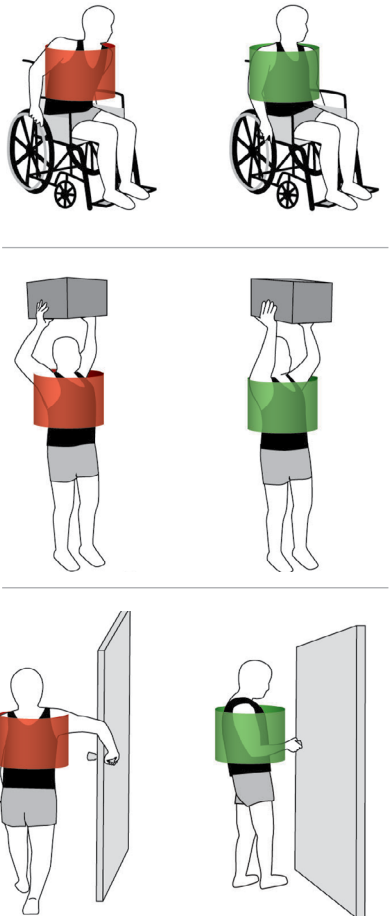
Sternal precautions post-cardiac surgery are variable and can be overly restrictive resulting in decreased mobility, increasing fear of movement, caregiver burden and the need for post-acute care. Overly restrictive limitations can impair the ability to discharge patients directly home following cardiac surgery. As part of our Enhanced Recovery after Surgery program we implemented, "Keep Your Move in The Tube" © (KYMITT) activity program as described in the literature. KYMITT guiding principles include utilizing shortened lever arms that lessen forces through the sternum, allowing patients to perform previously restricted upper extremity activities. We hypothesized that liberalization of sternal precautions and implementation of KYMITT would facilitate early mobility and discharge directly home for our patients without further complications.

The truncal tube, (seen in green) is the basis of the KYMITT approach. Patients are allowed to perform activities such as pushing, pulling and lifting immediately after surgery as long as the arms are kept close to the body, as if inside of an imaginary truncal tube. Keeping the arms close to the body shortens the lever arm during upper extremity weight bearing activities, minimizing the stress on the healing sternum while allowing patients to fully use their arms to facilitate transfers, bed mobility, stair training and gait. Additionally, patients are encouraged to perform full, unrestricted range of motion of the upper extremities when not putting weight through the arms improving independence in ADL's. The program encourages active movement, focusing on what the patient can do, rather than restricting activities with the goal to decrease fear of movement, decrease caregiver burden, increase safe early mobility and discharges to home.

We have now treated 1,600 patients following KYMITT. Since implementation, we have increased our discharges to home from 71% to 84% without an increase in sternal complications. We have now progressed to a more liberalized sternal program after surgery and are instructing patients to participate in any activity that does not elicit pain. We have treated 125 patients according to this "let pain be your guide" principle and are collecting data on outcomes. Our program remains focused on our goal of increased safe early mobility, allowing patients to return home and get back to life!

KEEP YOUR MOVE IN THE TUBE©





1. El-Ansary D, Lapier TK, Adams J, et al. An evidence-based perspective on movement and activity following median sternotomy. Phys Ther. 2019; 99:1587-1601.

2. Adams J, Lotshaw A, Exum E, et al. An alternative approach to prescribing sternal precautions after median sternotomy, keep your move in the tube. Proc(Bayl Univ Med Cent). 2016;29:97-100.

3. Holloway C, Pathare N, Huta J, et al. The impact of less restrictive poststernotomy activity protocol compared with standard sternal precautions in patients following cardiac surgery. Phys Ther. 2020;100:1074-1083.

4. Cahalin L, Lapier TK, Shaw D, et al. Sternal precautions: is it time for a change? Precautions versus restrictions- a review of literature and recommendations for revision. Cardiopulm Phys Ther J. 2011; 22:5-15.

RECENT ERAS® CARDIAC PUBLICATIONS:

>> Click titles for weblinks

1. Perioperative Care in Cardiac Surgery: A Joint Consensus Statement by the Enhanced Recovery After Surgery (ERAS) Cardiac Society, ERAS International Society, and The Society of Thoracic Surgeons (STS). Grant MC, Crisafi C, Alvarez A, Arora RC, Brindle ME, Chatterjee S, Ender J, Fletcher N, Gregory AJ, Gunaydin S, Jahangiri M, Ljungqvist O, Lobdell KW, Morton V, Reddy VS, Salenger R, Sander M, Zarbock A, Engelman DT. Ann Thorac Surg. 2024 Apr;117(4):669-689. doi: 10.1016/j.athoracsur.2023.12.006. Epub 2024 Jan 28. PMID: 38284956.

2. ERAS® Cardiac Society Turnkey Order Set for Surgical Site Infection Prevention: Proceedings from the AATS ERAS Conclave 2023. Crisafi C, Grant MC, Rea A, Morton-Bailey V, Gregory AJ, Arora RC, Chatterjee S, Lother SA, Cangut B, Engelman DT; ERAS Cardiac Working Group. J Thorac Cardiovasc Surg. 2024 Apr 2:S0022-5223(24)00281-2. doi: 10.1016/j.jtcvs.2024.03.027. Epub ahead of print. PMID: 38574802.

3. Association between improved compliance with enhanced recovery after cardiac surgery guidelines and postoperative outcomes: A retrospective study. Hoogma DF, Croonen R, Al Tmimi L, Tournoy J, Verbrugghe P, Fieuws S, Rex S. J Thorac Cardiovasc Surg. 2024 Apr;167(4):1363-1371.e2. doi: 10.1016/j.jtcvs.2022.07.010. Epub 2022 Jul 19. PMID: 35989120.

4. Temporary mechanical circulatory support & enhancing recovery after cardiac surgery. Lobdell KW, Grant MC, Salenger R. Curr Opin Anaesthesiol. 2024 Feb 1;37(1):16-23. doi: 10.1097/ACO.0000000000001332. Epub 2023 Nov 23. PMID: 38085881.

5. Perioperative hemodynamic monitoring in cardiac surgery. Grant MC, Salenger R, Lobdell KW. Curr Opin Anaesthesiol. 2024 Feb 1;37(1):1-9. doi: 10.1097/ACO.0000000000001327. Epub 2023 Nov 20. PMID: 38085877.

6. Comparison of Erector Spinae Plane Block and Pectointercostal Facial Plane Block for Enhanced Recovery After Sternotomy in Adult Cardiac Surgery. Elbardan IM, Abdelkarime EM, Elhoshy HS, Mohamed AH, ElHefny DA, Bedewy AA. J Cardiothorac Vasc Anesth. 2024 Mar;38(3):691-700. doi: 10.1053/j.jvca.2023.12.006. Epub 2023 Dec 12. PMID: 38151456.

7. Closing the care gap: combining enhanced recovery with minimally invasive valve surgery. Gregory AJ, Kent WDT, Adams C, Arora RC. Curr Opin Cardiol. 2024 Apr 9. doi: 10.1097/HCO.0000000000001147. Epub ahead of print. PMID: 38606679.

8. Extubation After Cardiac Surgery: It's Not the Destination, It's the Journey. Grant MC. Ann Thorac Surg. 2024 Jan;117(1):94-95. doi: 10.1016/j.athoracsur.2023.09.047. Epub 2023 Oct 14. PMID: 37839538.

9. Methadone Should Not Be Used in Cardiac Surgery as Part of Enhanced Recovery After Cardiac Surgery Protocol. Ibekwe SO, Everett L, Mondal S. J Cardiothorac Vasc Anesth. 2024 May;38(5):1272-1274. doi: 10.1053/j.jvca.2024.02.019. Epub 2024 Feb 22. PMID: 38503627.

10. Patient Experience Pre-Implementation of an Enhanced Recovery After Surgery Protocol: A Qualitative Investigation. Poletti B, Stringer G, Furness K. J Multidiscip Healthc. 2024 Mar 14;17:1147-1158. doi: 10.2147/JMDH.S453467. PMID: 38500482; PMCID: PMC10946404.

11. Early chest tube removal on the 1st postoperative day protocol of an enhanced recovery after cardiac surgery programme is safe. Darras M, Schneider C, Marguerite S, Oulehri W, Collange O, Mertes PM, Mazzucotelli JP, Kindo M. Eur J Cardiothorac Surg. 2024 Mar 1;65(3):ezae092. doi: 10.1093/ejcts/ezae092. PMID: 38466938.

12. Enhanced recovery after surgery: Preoperative carbohydrate loading and insulin management in type 2 diabetes. Bredefeld C, Patel A, Islam S, Peragallo-Dittko V. Surg Open Sci. 2024 Feb 25;18:107-110. doi: 10.1016/j.sopen.2024.02.012. PMID: 38464910; PMCID: PMC10920957.

13. Pro: Methadone Should Be Used as a Part of Enhanced Recovery After Cardiac Surgery Protocol. Garcia S, Mali M, Grewal A. J Cardiothorac Vasc Anesth. 2024 May;38(5):1268-1271. doi: 10.1053/j.jvca.2024.02.022. Epub 2024 Feb 21. PMID: 38458828.

14. The protocol of enhanced recovery after cardiac surgery in adult patients: A stepped wedge cluster randomized trial. Dou D, Yuan S, Jia Y, Wang Y, Li Y, Wang H, Ding J, Wu X, Bie D, Liu Q, An R, Yan H, Yan F. Am Heart J. 2024 Mar 2;272:48-55. doi: 10.1016/j.ahj.2024.02.024. Epub ahead of print. PMID: 38437910.

15. Enhanced recovery protocols after surgery: A systematic review and meta-analysis of randomized trials in cardiac surgery. Spadaccio C, Salsano A, Pisani A, Nenna A, Nappi F, Osho A, D'Alessandro D, Sundt TM, Crestanello J, Engelman D, Rose D. World J Surg. 2024 Apr;48(4):779-790. doi: 10.1002/wjs.12122. Epub 2024 Feb 29. PMID: 38423955.

16. Impact of Limited Enhanced Recovery Pathway for Cardiac Surgery: A Single-Institution Experience. Delijani D, Race A, Cassiere H, Pena J, Shore-Lesserson LJ, Demekhin V, Manetta F, Huang X, Karman DA, Hartman A, Yu PJ. J Cardiothorac Vasc Anesth. 2024 Jan;38(1):175-182. doi: 10.1053/j.jvca.2023.10.021. Epub 2023 Oct 20. PMID: 37980194.

17. Perioperative Implementation of Low-Dose Pregabalin in an Enhanced Recovery After Cardiac Surgery Protocol: A Pre-Post Observational Study. Patel A, Shah A, Apigo A, Lin HM, Ouyang Y, Huang K, Friedman S, Yimen M, Puskas JD, Bhatt HV. J Cardiothorac Vasc Anesth. 2024 Jan;38(1):183-188. doi: 10.1053/j.jvca.2023.09.045. Epub 2023 Oct 3. PMID: 37940456.

18. Perioperative Implementation of Low-Dose Pregabalin in an Enhanced Recovery After Cardiac Surgery Protocol: A Pre-Post Observational Study. Patel A, Shah A, Apigo A, Lin HM, Ouyang Y, Huang K, Friedman S, Yimen M, Puskas JD, Bhatt HV. J Cardiothorac Vasc Anesth. 2024 Jan;38(1):183-188. doi: 10.1053/j.jvca.2023.09.045. Epub 2023 Oct 3. PMID: 37940456.

IN THE NEWS:

EACTS Annual Meeting in Vienna, Austria

The ERAS Cardiac Executive Board was grateful for the opportunity to discuss best practices and cardiac enhanced recovery after surgery during the 2023 EACTS Annual Meeting in Vienna, Austria. Our team is looking forward to this year's meeting in Lisbon, Portugal.

STS Annual Meeting in San Antonio

President of ERAS® Cardiac Society, Dr. Daniel Engelman with Dr. Jeremiah Hayanga at STS Annual Meeting in San Anotinio, January, 2024.

UPCOMING MEETINGS:

>> Click on icons for weblinks

Minimally Invasive Extracorporeal Technologies International Society Anniversary Meeting
Thessaloniki, Greece
May 10-11, 2024

Evidence Based Perioperative Medicine World Congress
London, England
July 2-4, 2024

10th ERAS World Congress
Malaga, Spain
September 18-20, 2024

Evidence Based Perioperative Medicine Ireland Meeting
Dingle, Ireland
September 24-26, 2024

European Association for Cardio-Thoracic Surgery 38th Annual Meeting
Lisbon, Portugal
October 9-12, 2024

Advances in Critical Care
Houston, Texas
October 10-12, 2024

Society of Thoracic Surgeons Perioperative Medicine and Critical Care Meeting
Philadelphia, PA
October 24-30, 2024

ERAS© Cardiac Society MISSION

The mission of the ERAS® Cardiac Society is to optimize perioperative care of cardiac surgical patients through collaborative discovery, analysis, expert consensus, and dissemination of best practices worldwide.

Who We Are

The ERAS® Cardiac Society is an international non-profit organization comprised of experts from around the world, including participation from all members of the healthcare team. Led by an executive board, an advisory board, and a pool of subject matter experts, our members strive to implement enhanced recovery principles at their local institutions while advancing improved patient care internationally through collaboration, education, and dissemination of up-to-date knowledge regarding optimal perioperative care.

ERAS® Society

The ERAS® Society is an international organization with enhanced recovery guidelines for several surgical sub-specialties. Beginning as the ERAS® Study Group in 2001, team leaders Professor Ken Fearon (University of Edinburgh) and Professor Olle Ljungqvist (Karolinska Insitutet) spearheaded the developments made in multimodal surgical care. The ERAS® Study Group soon discovered that there were a variety of local traditions in practice, as well as an inconsistent application of evidence-based best practices. This prompted the group to examine the process of change from tradition to best-practice. Since its inception, the ERAS® Society has expanded to include several subspecialties, emphasized the benefits of standardized best-practices across the continuum of the perioperative period, highlighted the importance of data-driven self-evaluation, and promoted the improvement of patient care.

Our Organizational Structure

Our ERAS® Cardiac Society is made up of experts from around the world, including participation from all members of the healthcare team. Our members strive to implement enhanced recovery principals at their local institutions while advancing improved patient care internationally through collaboration, education, and dissemination of up-to-date knowledge regarding optimal perioperative care. Our organization is divided into an Executive Board, Advisory Board, and a pool of Subject Matter Experts.

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To learn more about our organization, including our board members and upcoming meetings:
www.erascardiac.org

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Corporate financial support will be used to promote the mission of the ERAS® Cardiac Society. We are committed to standardizing best practice surrounding the preoperative and perioperative care of cardiac surgical patients through expert consensus, review of the literature and open communication. This unrestricted support does not represent the ERAS® Cardiac Society's support or agreement to promote any pharmaceutical, device, or technology related to the sponsors.

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