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ADVENT FAST TRACK SYMPOSIUM 2025: ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

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BOOK OF ABSTRACTS

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

05 i 06. 12. 2025.

ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY
AND ANESTHESIA CARE

Editors-in-Chief

Prof. Višnja Nesek Adam, MD, PhD
Prof. Alan Ivković, MD, PhD

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ADVENT FAST TRACK SYMPOSIUM 2025:
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Henrik Kehlet

Introduction to FastTrack principles: History and development

Introduction to FastTrack principles: History and development

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[1]Section for Surgical Pathophysiology 7621, Rigshospitalet

Abstract

Fast-track surgery or Enhanced Recovery After Surgery (ERAS) programs were developed based on the fact that postoperative recovery and the risk of complications are multifactorial problems, thereby requiring a combination of treatment efforts.
The success of such programs is well documented from many detailed, well-designed cohort studies or RCTs, but the remaining problem is to implement of available evidence as well as to define the exact role of the individual components of such programs.
ERAS programs in orthopedic surgery are well established, now even approaching an outpatient setup, in unselected patients in about 20% or more and documented as safe and associated with improved outcomes.

Keywords: Enhanced Recovery After Surgery, ERAS, history

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Henrik Kehlet

Optimal postoperative pain management is a prerequisite for enhancing functional recovery after surgery.

Optimal postoperative pain management is a prerequisite for enhancing functional recovery after surgery.

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Abstract

Although many analgesics are available, further improvements in study design and the choice of analgesics are urgently needed, with a focus on a patient- and procedure-specific approach. The PROSPECT guidelines continuously update procedure specific pain recommendations.

Novel clinical trial designs should improve efficiency and focus on whether pain or other factors are limiting functional recovery, both during hospitalization and after discharge.

Keywords: Analgesics, guidelines, recovery

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Alan Ivković

State of the art total knee arthroplasty workflow in 2025

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

State of the art total knee arthroplasty workflow in 2025

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Abstract

Modern total knee arthroplasty (TKA) in 2025 applies a fast-track protocols to optimize safety, accelerate recovery, and improve outcomes for elective patients. The multidisciplinary workflow includes best practices spanning preoperative, intraoperative, and postoperative phases with emphasis on multimodal pain management, minimized blood loss, and precision alignment strategies.

Preoperatively, patient selection, education, and prehabilitation are combined with preemptive multimodal analgesia and early administration of tranexamic acid (TXA) to reduce bleeding. Optimization of nutritional status with carbohydrate loading and prophylactic dexamethasone for nausea and inflammation are routine.

Intraoperatively, tissue-sparing alignment strategies—kinematic alignment (KA), restricted kinematic alignment (rKA), and personalized alignment (PA)—are utilized to replicate native knee kinematics, minimize unnecessary ligament releases, and enhance functional outcomes. Short-acting regional anesthesia, local infiltration analgesia, repeat TXA dosing, dexamethasone, and active intraoperative warming further reduce pain, blood loss, and complications.

Postoperatively, patients benefit from early mobilization, opioid-sparing analgesia, rapid oral intake, and protocol-driven discharge criteria. Digital home monitoring and structured physiotherapy continue post-discharge, yielding accelerated recovery, fewer complications, and high satisfaction.

Keywords: total knee arthroplasty, multimodal pain management, ERAS

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PRE- OR

Sanja Jakovina Blažeković

Correlation of asa scale with complications, outcomes and revision

Correlation of asa scale with complications, outcomes and revision

Sanja Jakovina Blažeković[1]
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Abstract

The American Society of Anesthesiologists (ASA) physical status classification system is a grading system to determine the health of a person before a surgical procedure that requires anesthesia.ASA classification uses a grading system of one through five. The sixth status identifies deceased organ donors.

The purpose of the system is to assess and communicate a patient's pre-anesthesia medical co-morbidities. The classification system alone does not predict the perioperative risks and surgical outcome but used with other factors (eg type of surgery, frailty, level of deconditioning), it can be helpful in predicting perioperative risks. Many studies confirm that patients with higher ASA scores associated with severe systemic diseases may have at increased risk of adverse outcomes. ASA physical status clasiffication is predictor of postoperative outcome and seems to have direct corrleation with multiple factors, such as the hospitalization days, the severity complications and the total hospitalization costs. Patients with preoperative ASA classes III-IV have a higher risk of revision and other reoperation. Additional limitations in the ASA classification system include it is nonbinary nature and facts that age does not included.ASA physical status classification system remains one of the most widely used assessment and communication tools to describe a surgical patient's overall condition.

Keywords: ASA physical status, complications, outcomes, revision.

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ADVENT FAST TRACK SYMPOSIUM 2025:
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Tihana Magdić Turković

Diabetes mellitus - what to consider for orthopaedic patients

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Diabetes mellitus - what to consider for orthopaedic patients

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Abstract

Diabetes mellitus is a major public health concern, with Croatia ranking among the top five European countries in diabetes prevalence. Approximately 10–15% of the population is affected, significantly influencing orthopedic surgical outcomes. This lecture addresses key perioperative considerations for diabetic patients undergoing orthopedic procedures. Preoperative assessment includes evaluating glycemic control (HbA1c, blood glucose, fructosamine) and identifying diabetes-related chronic complications. Optimization of blood glucose levels prior to surgery is essential to reduce postoperative morbidity. The management of antidiabetic therapy – oral agents and insulin – requires individualized adjustment to minimize the risks associated with their use. Regional anesthesia is often preferred due to its metabolic and hemodynamic advantages. Intraoperative glucose monitoring and correction protocols are emphasized, alongside infection prevention and antibiotic stewardship. Postoperatively, early nutrition, mobilization, and resumption of usual therapy are encouraged to promote recovery. The presentation highlights current international guidelines and evidence-based strategies to optimize perioperative outcomes in diabetic orthopedic patients.

Keywords: diabetes mellitus, morbidity, guidelines

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Nikolina Schatzl

Nutritional status and arthroplasty: malnutrition and obesity

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Nutritional status and arthroplasty: malnutrition and obesity

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Abstract

Nutritional status is a well-established and highly modifiable determinant of postoperative outcomes in total joint arthroplasty (TJA). Malnutrition is independently associated with impaired wound healing, increased rates of surgical site infection (SSI) and prosthetic joint infection (PJI), prolonged length of stay, higher readmission rates, and diminished functional recovery. Its prevalence among TJA candidates has been reported to reach up to 50%. Although traditional biomarkers such as serum albumin and total lymphocyte count have been widely used in orthopaedic practice, contemporary diagnostic criteria—defined by the Global Leadership Initiative on Malnutrition (GLIM)—require the presence of both phenotypic indicators (involuntary weight loss, reduced body mass index, low muscle mass) and etiologic factors (reduced intake or absorption, disease burden, inflammation). Conventional metrics such as body mass index fail to reflect true body composition and often underestimate metabolic risk. Obesity contributes to the progression of severe osteoarthritis necessitating arthroplasty and is associated with increased short- and long-term postoperative complications. Perioperative nutritional care should therefore target all patients at risk, including those who are undernourished, obese, sarcopenic, or frail. Sarcopenic obesity represents a particularly high-risk phenotype, characterized by excess adiposity and reduced skeletal muscle mass, which markedly compromises postoperative performance. Despite the availability of multiple nutritional screening tools, no universal “gold standard” has been established. In patients with significant metabolic risk or confirmed malnutrition, preoperative conditioning—such as structured prehabilitation—should be considered to optimize surgical readiness.

Keywords: arthroplasty, malnutrition, obesity, sarcopenic obesity, metabolic risk

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Janja Tarčuković et al.

Preoperative Fasting and Carbohydrate Treatment in Orthopedic Surgery: Current Evidence and Guideline Recommendations

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

Preoperative Fasting and Carbohydrate Treatment in Orthopedic Surgery: Current Evidence and Guideline Recommendations

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Abstract

Introduction and Aim: Preoperative fasting is a well-established component of surgical preparation aimed at minimizing pulmonary aspiration risk during anesthesia. Traditional fasting practices required abstinence from oral intake for prolonged periods, often exceeding 12 hours, which has been associated with increased perioperative stress, dehydration, and postoperative insulin resistance. Contemporary guidelines advocate for an individualized, evidence-based approach that combines safe reduction in fasting duration with consideration of preoperative carbohydrate treatment. This review summarizes current evidence and consensus recommendations relevant to orthopedic procedures, particularly total hip and knee replacement.

Discussion: Current European Society of Anaesthesiology and Intensive Care (ESAIC) and American Society of Anesthesiologists (ASA) guidelines recommend fasting for solids for at least six hours and clear fluids for two hours before induction of anesthesia. Within Enhanced Recovery After Surgery (ERAS) pathways, the use of carbohydrate-containing clear fluids up to two hours preoperatively has been shown to attenuate postoperative insulin resistance and improve metabolic stability. In orthopedic surgery, small randomized controlled trials report beneficial effects on preoperative hunger, thirst, nausea, and postoperative pain, as well as improved glucose metabolism and insulin sensitivity. However, the available evidence does not confirm a reduction in complication rates or length of hospital stay after hip and knee arthroplasty. Consequently, routine carbohydrate loading is not recommended as an essential intervention but may be considered in selected patient populations, such as older adults or those with metabolic commorbidities.

Conclusion: Modern perioperative care supports shortened fasting times and selective preoperative carbohydrate treatment as safe and patient-centered practices aligned with ESAIC and ERAS guidelines. Adherence to these evidence-based protocols improves comfort, maintains metabolic stability, and promotes enhanced recovery, while emphasizing individualized application based on procedural and patient-specific factors.

Keywords: preoperative fasting, ERAS, carbohydrate loading, orthopedic surgery, anaesthesia

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ADVENT FAST TRACK SYMPOSIUM 2025:
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Sonja Krofak

Perioperative thromboprophylaxis

Perioperative thromboprophylaxis

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Abstract

Perioperative thromboprophylaxis represents a core component of Enhanced Recovery After Surgery (ERAS) pathways in major orthopedic procedures, particularly total hip and knee arthroplasty, where baseline venous thromboembolism (VTE) risk is among the highest in elective surgery. Contemporary international guidelines emphasize that optimal VTE prevention requires an individualized risk-adapted strategy integrated with perioperative blood management (PBM) principles and standardized ERAS protocols.

The preoperative phase includes systematic assessment of VTE and bleeding risk, correction of anemia, minimization of fasting, optimized hydration, and proactive planning of perioperative hemostasis. Intraoperatively, routine use of tranexamic acid, reduction of allogeneic transfusion, and strict adherence to neuraxial anesthesia timing intervals form the essential PBM foundation. Postoperatively, early mobilization, mechanical prophylaxis, and timely initiation of pharmacologic prophylaxis remain central ERAS components.

Pharmacologic thromboprophylaxis is most commonly achieved with low-molecular-weight heparin (LMWH) or direct oral anticoagulants (DOACs). DOACs have increasingly been endorsed for their predictable kinetics and ease of use. Current recommendations support extended-duration prophylaxis: 28–35 days after total hip arthroplasty and 10–14 days after total knee arthroplasty, with longer durations in patients with additional VTE risk factors.

A key clinical challenge involves patients with atrial fibrillation receiving DOAC therapy and presenting with high CHA_2DS_2-VASc scores. Recent guidelines consistently emphasize that heparin bridging is not recommended when interrupting DOAC therapy, even in high-risk patients, because bridging increases perioperative bleeding without proven benefit in reducing thromboembolic events.

By integrating PBM strategies, evidence-based pharmacologic prophylaxis, and accelerated postoperative rehabilitation, ERAS pathways enable simultaneous reduction of VTE incidence, transfusion requirements, and perioperative complications. A coordinated multidisciplinary team is essential for consistent implementation of these recommendations and for achieving optimal safety and outcomes in high-complexity orthopedic patients.

Keywords: perioperative thromboprophylaxis, total hip arthroplasty, ERAS

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Višnja Nesek Adam

Preoperative Anemia and Blood Management: A Multimodal Surgeon–Anesthesiologist Approach

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Preoperative Anemia and Blood Management: A Multimodal Surgeon–Anesthesiologist Approach

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Abstract

Preoperative anemia is a frequent and clinically relevant condition in orthopedic surgery, especially among elderly patients and those undergoing major procedures such as joint replacement or spine surgery. Although its prevalence varies, anemia remains a significant and modifiable risk factor linked to increased transfusion rates, postoperative complications, delayed rehabilitation, and higher mortality.
Optimal management requires a coordinated, multidisciplinary approach within a patient blood management (PBM) framework. Early screening and treatment of anemia through correction of underlying causes, intravenous iron supplementation, erythropoiesis-stimulating agents, and nutritional optimization should be undertaken whenever possible before elective surgery. Intraoperative strategies focusing on hemostasis, antifibrinolytic use, normothermia, controlled hypotension, and restrictive transfusion thresholds further reduce blood loss and improve oxygen delivery.
Implementation of PBM programs in orthopedic practice has been shown to significantly reduce allogeneic transfusion requirements, shorten hospital stays, and enhance functional recovery without compromising safety. A multimodal, surgeon–anesthesiologist partnership that integrates prevention, optimization, and conservation principles is essential for improving surgical outcomes and ensuring high-quality, patient-centered orthopedic care.

Keywords: preoperative anemia, iron, outcome

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ADVENT FAST TRACK SYMPOSIUM 2025:
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PERI-OPERATIVE I

Slaven Babić

Urinary catheter and drainage

Urinary catheter and drainage

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Abstract

Urinary catheters and surgical drains remain integral components of perioperative management, yet their use in fast-track orthopaedic surgery is increasingly questioned. Enhanced Recovery After Surgery (ERAS) protocols emphasize early mobilization, minimization of complications, and reduction of unnecessary devices that may impair patient recovery. This review summarizes current evidence and clinical considerations regarding urinary catheterization and postoperative drainage within fast-track pathways.

Routine urinary catheter use in elective hip and knee arthroplasty is associated with higher rates of urinary tract infection, delayed mobilization, and increased patient discomfort. Selective catheterization—guided by individual risk factors, anesthetic technique, and intraoperative fluid balance—has been shown to significantly reduce these complications without increasing postoperative urinary retention. Similarly, the routine placement of surgical drains has not demonstrated clear benefits in reducing hematoma, infection, or wound complications. Conversely, drains may prolong wound leakage, increase transfusion requirements, and delay physiotherapy initiation.

Fast-track protocols support an individualized, evidence-based approach that limits catheter and drain use to well-defined indications. When applied appropriately, this strategy contributes to shorter length of stay, improved functional recovery, and higher patient satisfaction. Ongoing audit and multidisciplinary collaboration remain essential to refine decision-making and ensure optimal outcomes.

Keywords: Enhanced Recovery After Surger, urinary catheter, drainage

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Sanda Stojanović Stipić

Intraoperative hypotension

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Intraoperative hypotension

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Abstract

Intraoperative hypotension (IOH) is typically defined by a sustained decrease in mean arterial pressure (MAP), often below 60–70 mm Hg. IOH can compromise perfusion to vital organs, including the brain, heart, and kidneys. About one third of perioperative hypotensive episodes occur in the period after the induction of general anaesthesia but before surgical incision and can be described as postinduction or preincision hypotension. Postinduction hypotension should be distinguished from phases of hypotension during surgery, as the causes of hypotension vary across different stages.
IOH can be caused by vasodilation (anaesthetic drugs, systemic inflammation), intravascular hypovolaemia (bleeding), low cardiac output (bradycardia or low stroke volume), high intra-thoracic pressure (mechanical ventilation), impairment of the sympathetic nervous system or compromised baroreflex regulation. Several risk factors for IOH have been identified, such as older age, high ASA class, male sex, lower pre-induction SAP, general anaesthesia with propofol, the combination of general and regional anaesthesia, the duration of surgery, and emergency surgery.
Based on current knowledge, anesthesiologists should carefully screen patients at risk for hypotension at the time of the preoperative evaluation, pay a high level of attention to perioperative clinical management to avoid hypotensive episodes, and treat the disease aggressively and promptly.

Keywords: intraoperative hypotension, postinduction hypotension, perioperative risk management

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Tina Tomić Mahečić

Restrictive transfusion thresholds

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Restrictive transfusion thresholds

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Abstract

The fundamental misconception behind restrictive vs. liberal transfusion practices is the assumption that Hb is the only factor determining tissue oxygenation. Oxygen delivery (DO_2) is the product of cardiac output and arterial oxygen content (1). When Hb levels fall, the body activates complex compensatory mechanisms that sustain adequate tissue oxygenation over a surprisingly wide range of Hb concentrations.

Healthy adults can sustain adequate oxygen delivery at Hb concentrations as low as 4-5 g/dL through increased cardiac output and improved oxygen extraction (2). The key is normovolemia—maintaining blood volume (3). Studies in healthy volunteers undergoing acute normovolemic haemodilution show that cognitive function and neurophysiologic parameters remain intact at Hb levels of 5 g/dL, with compensatory increases in cardiac output preserving oxygen delivery (4).

Beyond immunomodulation, transfusion carries specific risks, including transfusion-related acute lung injury (TRALI), transfusion-associated circulatory overload (TACO), and hemolytic reactions (5). These complications disproportionately affect vulnerable populations—precisely those most likely to receive liberal transfusion.

The majority of evidence—including numerous randomised trials, meta-analyses, and observational studies—favours restrictive transfusion thresholds over liberal ones for most perioperative patients (6). An Hb level of 7 g/dL is the established evidence-based standard for hemodynamically stable patients without active bleeding (7).

Exceptions exist—particularly traumatic brain injury and possibly unstable acute coronary syndromes—but these should be managed with individualised assessment rather than reflexive liberal transfusion (8). The key is recognising that Hb concentration alone is insufficient to capture oxygen delivery, tissue perfusion, or patient-specific risk (9).

The modern restrictive approach isn't just about giving less blood; it's about achieving better outcomes through physiologically informed, evidence-based care.

Keywords: Restrictive transfusion strategy, hemoglobin, patient outcomes

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Ira Skok

Current standards in total knee arthroplasty (TKA) anesthesia protocols

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Current standards in total knee arthroplasty (TKA) anesthesiaprotocols

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Abstract

Total knee arthroplasty is one of the most painful operations in orthopedic surgery. The anterior pain persists 72 hours postoperatively and posterior pain for 24 hours. There is still a high rate of chronic pain due to inadequate acute pain therapy. Pain blocks movement which is crucial for rapid recovery. Patients start to feel anxious and depressed.

Anesthesia protocol for TKA offers a multimodal, opioid-sparing analgesic plan, recommended by PROSPECT guidelines, to optimize outcomes based on the latest evidence. The central part is regional anesthesia and knowledge of nerve blocks with extended-release pharmacology. Regional nerve block incorporates a combination of adductor canal block with some blocks for the posterior part of the knee. The choice of local anesthetic offers controlled, prolongedlocal anestethic release at the target nerve site. Ultrasound-guided technique contributes to the success of the block and reduced dose of local anesthetic.

Patient-centered outcomes depend on anesthesiologists trained in precision regional anesthesia and the understanding of pharmacologic tools that extend block duration safely and predictably. In optimal combination of everything written recovery transforms from endurance to empowerment.

Keywords: total knee arthroplasty, regional anesthesia / nerve blocks, multimodal analgesia

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Jure Serdar et al.

Local Infiltration Analgesia and Tranexamic Acid in Orthopaedic Surgery

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

Local Infiltration Analgesia and Tranexamic Acid in Orthopaedic Surgery

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Abstract

Optimizing perioperative management in orthopedic surgery is crucial for reducing pain, minimizing blood loss, and promoting early functional recovery. Local infiltration analgesia (LIA) and tranexamic acid (TXA) have emerged as cornerstone interventions within modern multimodal protocols. LIA provides targeted, opioid-sparing pain relief through infiltration of local anesthetics—often combined with corticosteroids and nonsteroidal anti-inflammatory drugs—directly into surgical tissues. This technique reduces postoperative discomfort, facilitates early mobilization, and limits systemic opioid consumption.

Simultaneously, TXA, an antifibrinolytic agent, effectively decreases intraoperative and postoperative bleeding across various orthopedic procedures, including arthroplasty, trauma fixation, and spine surgery. Its use has been shown to lower transfusion requirements without increasing thromboembolic complications when administered via intravenous, topical, or combined routes.

Evidence increasingly supports the synergistic application of LIA and TXA, demonstrating superior pain control, reduced perioperative blood loss, and shorter hospital stays compared with conventional regimens. This approach aligns with enhanced recovery after surgery (ERAS) principles and contributes to improved patient satisfaction and cost-effectiveness.

In conclusion, the integration of LIA and TXA represents a safe, evidence-based, and efficient strategy for perioperative optimization in orthopedic surgery, supporting faster recovery and better overall outcomes within contemporary surgical practice.
Keawords: Local infiltration analgesia, tranexamic Acid

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Krešimir Oremuš

Perioperative management of anticoagulation in arthroplasty patients

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Perioperative management of anticoagulation in arthroplasty patients

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Abstract

This lecture synthesizes recent evidence and recommendations to establish evidence-based perioperative anticoagulation management that optimizes patient safety while eliminating unnecessary interventions.
Perioperative anticoagulation management in arthroplasty patients represents one of the most clinically challenging decisions in orthopedic anesthesia, requiring careful risk stratification balancing catastrophic thromboembolism against haemorrhagic complications. Total knee and hip arthroplasty are classified as high bleeding risk procedures, necessitating meticulous coordination between anaesthesia, orthopaedic surgery, and anticoagulation services (cardiologist, haematologist) to optimize patient outcomes. Recent evidence fundamentally reshapes traditional bridging practices, increasingly supporting selective rather than routine bridging strategies.
Vitamin K antagonists require discontinuation 5 days preoperatively; bridging therapy with low molecular weight or unfractionated heparin should be reserved for demonstrably high-risk patients including mechanical heart valve recipients and those with antiphospholipid syndrome. Non-vitamin K antagonist oral anticoagulants (NOACs) offer predictable pharmacokinetics, typically requiring shorter preoperative discontinuation based on agent and renal function, and generally do not mandate bridging in standard arthroplasty patients. Postoperative resumption timing should integrate objective haemostasis assessment with thromboembolism prevention, recognizing that perioperative protocol adherence reduces bleeding complications. Special populations including frail elderly patients and those with severe renal impairment demand individualized approaches prioritizing net clinical benefit assessment.

Keywords: anticoagulation, arthroplasty

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY
AND ANESTHESIA CARE

PERI- OPERATIVE II

Marina Banović

Peripheral Nerve Blocks in Perioperative Settings: Evidence, Guidelines, and ERAS Integration

Peripheral Nerve Blocks in Perioperative Settings: Evidence, Guidelines, and ERAS Integration

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Abstract

Peripheral nerve blocks (PNBs) are a fundamental component of modern perioperative care, especially within Enhanced Recovery After Surgery (ERAS) pathways in orthopaedic and trauma surgery. High-quality evidence demonstrates that PNBs provide superior analgesia compared with systemic opioids, reduce postoperative opioid consumption by 30–55%, and support earlier mobilization—key ERAS targets associated with improved outcomes and shorter hospital stays. Systematic reviews (PCORI/AHRQ) and recent meta-analyses (BJA 2025, JAMA Surgery 2024) confirm consistent benefits in total hip arthroplasty (THA), total knee arthroplasty (TKA), and acute trauma procedures.

Procedure-specific guidance further supports motor-sparing techniques. PROSPECT recommendations endorse fascia iliaca and pericapsular nerve group (PENG) blocks for THA, and adductor canal block (ACB) with iPACK for TKA, balancing analgesia with preserved quadriceps strength to enable early rehabilitation.

Current practice is shaped by major international guidelines. The ASRA 2025 anticoagulation guideline clarifies the safety of superficial blocks under DOAC therapy and recommends neuraxial-equivalent timing for deep plexus blocks. ESAIC/ESRA guidance emphasizes risk stratification, use of checklists, and adoption of structured safety practices including ultrasound guidance, nerve stimulation, and injection pressure monitoring.

PNBs are integrated into perioperative workflows, highlighting evidence-based block selection, guideline-driven safety practices, and the role of multidisciplinary coordination within ERAS pathways. When performed according to contemporary recommendations, PNBs remain one of the safest, most effective strategies to optimize postoperative recovery in orthopaedic and trauma patients.

Keywords: peripheral nerve block, ERAS, ASRA, ESRA, PROSPECT, orthopaedic anesthesia, analgesia

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Igor Filipovski

Ultrasound guided percutaneous cryoneurolysis for the treatment of acute post-surgical pain

Ultrasound guided percutaneous cryoneurolysis for the treatment of acute post-surgical pain

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Abstract

Cryoneurolysis represents an emerging, minimally invasive technique for the management of acute and postoperative pain. By applying extremely low temperatures to peripheral nerves under ultrasound guidance, this procedure induces a temporary axonotmesis, effectively interrupting nociceptive transmission while allowing for subsequent nerve regeneration.
This presentation provides an in depth overview of the underlying biophysical mechanisms of cryoneurolysis, including the processes of ice crystal formation, Wallerian degeneration, and axonal recovery.
Clinical indications for ultrasound guided cryoneurolysis will be discussed, with emphasis on its potential role in reducing opioid consumption, enhancing postoperative recovery, and extending the duration of analgesia compared to conventional regional anesthesia techniques. The presentation will also address procedural aspects such as patient selection, ultrasound visualization of target nerves, and cryoprobe placement. Potential complications and side effects, including neuropraxia, dysesthesia, and local tissue injury, will be analyzed in the context of current evidence.
Furthermore, practical challenges associated with implementing cryoneurolysis in the perioperative environment, such as training requirements, procedural logistics, and integration within multimodal analgesic pathways will be explored. Through a synthesis of current research and clinical experience, this presentation aims to highlight the therapeutic potential and limitations of ultrasound guided cryoneurolysis as a novel approach for managing acute postoperative pain and improving patient outcomes in surgical care.

Keywords: cryoneurolysis, acute postoperative pain, training

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Ivan Radoš

Ultrasound guided percutaneous cryoneurolysis for the treatment of acute post-surgical pain

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

Ultrasound guided percutaneous cryoneurolysis for the treatment of acute post-surgical pain

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Abstract

Cryoneurolysis represents an emerging, minimally invasive technique for the management of acute and postoperative pain. By applying extremely low temperatures to peripheral nerves under ultrasound guidance, this procedure induces a temporary axonotmesis, effectively interrupting nociceptive transmission while allowing for subsequent nerve regeneration. This presentation provides an in depth overview of the underlying biophysical mechanisms ofcryoneurolysis, including the processes of ice crystal formation, Wallerian degeneration, and axonal recovery.
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Furthermore, practical challenges associated with implementing cryoneurolysis in the perioperative environment, such as training requirements, procedural logistics, and integration within multimodal analgesic pathways will be explored. Through a synthesis of current research and clinical experience, this presentation aims to highlight the therapeutic potential and limitations of ultrasound guided cryoneurolysis as a novel approach formanaging acute postoperative pain and improving patient outcomes in surgical care.

Keywords: Cryoneurolysis, peripheral nerve block / nerve analgesia, postoperative pain management

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Martin Čemerin et al.

Direct Anterior Approach in Fast-Track Total Hip Arthroplasty

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

Title: Direct Anterior Approach in Fast-Track Total Hip Arthroplasty

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Abstract

Introduction and Aim: Fast-Track total hip arthroplasty (THA) aims to reduce surgical stress, minimize postoperative pain and nausea, and enable early mobilization through coordinated perioperative pathways. Surgical technique plays a key role in achieving these goals. The Direct Anterior Approach (DAA), characterized by its intermuscular and internervous interval, has gained increasing attention for its favorable early recovery profile. The aim of this review is to summarize evidence on the compatibility of DAA with Fast-Track principles, identify common perioperative barriers to early mobilization, and outline surgical and perioperative strategies that may optimize recovery.

Discussion: Multiple comparative studies, randomized trials, and meta-analyses report that DAA is associated with reduced soft-tissue trauma, lower early postoperative pain, decreased opioid consumption, shorter length of stay, and faster achievement of functional milestones compared with traditional approaches. Improved early functional outcomes, including Harris Hip Score and WOMAC performance, have been consistently observed.
DAA's preservation of muscular and posterior capsular structures reduces mechanical restrictions and facilitates early ambulation, aligning well with Fast-Track pathways. However, real-world Fast-Track implementation frequently fails to achieve expected timelines for mobilization. The most commonly reported barriers include orthostatic hypotension, postoperative nausea and vomiting (PONV), and excessive sedation—factors largely influenced by intraoperative hemodynamic management, opioid exposure, and the use of specific anesthetic protocols.
Literature supports several strategies to overcome these limitations such as the use low-dose spinal anesthesia, multimodal non-opioid analgesia, careful fluid and hemostasis management, local infiltration analgesia, and precise component positioning. These measures minimize physiological stress and support early mobilization regardless of surgical approach, but their benefits appear amplified when combined with the tissue-sparing nature of DAA.

Conclusion: DAA naturally complements Fast-Track THA principles by minimizing tissue trauma and improving early functional recovery. Achieving the full potential of Fast-Track protocols requires coordinated perioperative care focused on hemodynamic stability, opioid-sparing pain control, and avoidance of sedation, together with consistent surgical technique and multidisciplinary collaboration.

Keywords: Direct anterior approach; Fast-Track total hip arthroplasty; early mobilization.

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY
AND ANESTHESIA CARE

POST OPERATIVE

Darija Granec

The role pf physical therapy in arthroplasty patients

The role pf physical therapy in arthroplasty patients

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Abstract

Physical therapy (PT) is a essential part of postoperative care for patients undergoing joint arthroplasty. The primary goals of PT in this context are to restore joint function, reduce pain, enhance mobility, and improve quality of life.

Early initiation of PT improves early functional recovery, reduces hospital length of stay and short-term disability. Prehabilitation provides early benefits but limited long-term impact. Evidence remains various for enhanced or high-intensity protocols, which do not appear to improve long-term function.

Recent research has explored the effectiveness of various PT modalities, the timing and intensity of interventions, and the comparative benefits of supervised versus home-based or digital rehabilitation programs. While PT is widely regarded as beneficial, evidence suggests that the optimal approach may vary depending on patient characteristics, type of arthroplasty, and healthcare system factors. Importantly, frail individuals and patients with high pain catastrophizing may require more structured, tailored programs.

In conclusion, evidence supports transitioning from universal supervised PT to risk-stratified pathways: digital/home-based programs for standard-risk patients and intensive therapy for high-risk subgroups. Implementation of hybrid care models could maintain clinical outcomes while substantially reducing rehabilitation costs. How to distinguish patients at high risk of poor postoperative outcome in the healthcare system remains crucial.

Keywords: physical therapy, joint arthroplasty rehabilitation, risk-stratified

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Ana Lamza

Persistent Wound Drainage After Total Joint Arthroplasty: Clinical Challenges, Management Strategies, and the Need for Standardized Protocols

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Persistent Wound Drainage After Total Joint Arthroplasty: Clinical Challenges, Management Strategies, and the Need for Standardized Protocols

Ana Lamza[1],

Abstract

Persistent wound drainage (PWD) is a significant postoperative complication following total joint arthroplasty (TJA), primarily due to its close association with periprosthetic joint infection (PJI). PJI can severely impact patient recovery, increase morbidity, and create substantial financial pressures on healthcare systems. The lack of a universally accepted definition for PWD has led to variability in diagnosis and treatment, complicating clinical management. Initial management favors conservative strategies such as absorbent dressings, pressure bandages, and immobilization. However, if drainage continues for more than 5–7 days, surgical interventions—including open debridement, irrigation, negative pressure wound therapy (NPWT), and antimicrobial therapy—are considered. Recent evidence supports the use of single-use NPWT to reduce surgical site infections and wound complications, yet the absence of standardized protocols contributes to inconsistent care and the risk of inappropriate treatment. We are in need for unified definitions and algorithmic approaches to PWD. Standardized, evidence-based protocols would provide clearer guidance, improve outcomes, reduce PJI rates, and optimize resource use.

Key words: Persistent wound drainage, SSI, periprostetic joint infection, sNPWT

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Frane Grubišić

Early mobilization, continuous passive motion and cryotherapy

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Early mobilization, continuous passive motion and cryotherapy

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Abstract

Early mobilization, cryotherapy and continuous passive motion (CPM) have been important components of postoperative rehabilitation following total knee replacement (TKR) or total hip arthroplasty (THA). Early mobilization, usually initiated within the first 24-48 hours after surgery, has been shown to enhance joint function, reduce pain, shorten hospital stays and contributes to the prevention of complications (eg. venous thromboembolism, pneumonia...) and promote earlier return to daily activities and independence (1-3). It is also is a cornerstone of the Enhanced Recovery After Surgery (ERAS) programs in THA or TKA (4,5). Cryotherapy effectively reduces postoperative pain, swelling, and inflammation, allowing earlier participation in physiotherapy and improved joint mobility.

In contrast, the role of continuous passive motion remains more controversial. Evidence indicates that CPM following TKR may provide modest improvements in early knee flexion and short-term pain reduction but does not appear to yield significant long-term functional benefits when compared with active physiotherapy alone (6). For THA, CPM offers limited advantages, as early active mobilization and progressive weight-bearing exercises are typically more effective in restoring hip function and mobility (7).

Integrating early mobilization and cryotherapy as primary strategies, with CPM as an adjunct when indicated, provides a comprehensive approach to enhancing recovery and patient satisfaction after joint replacement. Individualized protocols tailored to surgical and patient factors ensure optimal outcomes.

Keywords: total knee replacement, total hip arthroplasty, early mobilization, continuous passive motion, postoperative rehabilitation, physiotherapy

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Mirna Bobinac

Prevention of postpoperative nausea and womiting

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Prevention of postpoperative nausea and womiting

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Abstract

Postoperative nausea and vomiting (PONV) represent one of the most frequent and uncomfortable complications in the first 24 hours following anesthesia or surgery. Although often perceived as a minor issue, PONV has significant clinical relevance because it can substantially impair patient comfort, delay early mobilization, and prolong hospitalization. In more severe cases, it may lead to dehydration, electrolyte imbalance, aspiration, wound dehiscence, or increased intracranial and intraocular pressure, all of which elevate postoperative risk and healthcare costs. Certain patients are particularly susceptible—especially females, non-smokers, individuals with a history of PONV or motion sickness, and those expected to receive postoperative opioids or volatile anesthetics.

Effective management of PONV begins with proper risk assessment, most commonly through validated tools such as the Apfel score, which quantifies individual risk based on four well-established factors. The higher the risk, the more comprehensive and multimodal the prophylaxis should be. Preventive therapy remains the cornerstone of PONV management, and modern protocols rely on a combination of different pharmacological classes. Commonly used agents include dexamethasone administered at induction, 5-HT3 antagonists such as ondansetron at the end of surgery, and when indicated additional drug classes such as NK-1 antagonists, dopamine antagonists, or antihistamines. At the same time, anesthetic strategies can significantly influence PONV incidence; minimizing opioid use through multimodal analgesia, avoiding nitrous oxide, reducing exposure to volatile anesthetics, choosing TIVA with propofol when appropriate, and ensuring adequate hydration are all important components of prevention. Regional anesthesia, when feasible, further reduces risk.

Despite optimal prophylaxis, PONV can still occur, and treatment then requires a rational and structured approach. A key principle is to use an antiemetic from a different pharmacological class than the one given for prevention, as repeating the same class offers little benefit. Persistent symptoms warrant reassessment of contributing factors such as uncontrolled pain, hypotension, or fluid deficit, and in some cases, additional classes of antiemetics or even low-dose propofol administered by an anesthesiologist may be needed.

Ultimately, successful PONV management relies on a multimodal, individualized approach that integrates risk stratification, evidence-based prophylaxis, and targeted rescue therapy. By reducing patient discomfort, minimizing complications, and supporting earlier mobilization, effective PONV strategies play a vital role in enhanced recovery pathways and contribute meaningfully to improved postoperative outcomes.

Keywords: Postoperative nausea and vomiting (PONV), Apfel score, multimodal antiemetic therapy

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY
AND ANESTHESIA CARE

FREE PAPERS

Sena Cerin et al.

Time to Mobilization After Spinal Anesthesia: Experience in 20 Patients Undergoing Knee Arthroscopy

Time to Mobilization After Spinal Anesthesia: Experience in 20 Patients Undergoing Knee Arthroscopy

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Abstract

Introduction: Although there is no evidence that 24-hour bed rest after spinal anesthesia reduces the risk of post-dural puncture headache, it is still frequently applied in clinical practice. Factors influencing the occurrence of post-dural puncture headache and the decision on verticalisation include patient characteristics (age, sex, BMI) as well as technical factors (needle gauge, tip design, number of puncture attempts, patient position during the procedure). According to recent guidelines, the decision on verticalisation should be based on the patient's clinical status (return of sensation and motor function, stability of vital signs).

Methods: The study included 20 patients (9 male) undergoing knee arthroscopy under spinal anesthesia, who completed a questionnaire regarding the timing of postoperative verticalisation.

Results: The median age of participants was 51.5 years (IQR 32–68), median BMI 28.7 kg/m² (IQR 23.3–42.6), and median height 171 cm (range 153–190). Only 3 patients were punctured with a 25G needle, while all others received atraumatic 26G or 27G needles. The median time to mobilization after puncture was 8.5 hours (IQR 7–21). The shortest time was 5 hours, and the longest 26 hours. A multiple linear regression analysis included age, sex, height, BMI, time of admission to the ward, and needle size. None of the predictors showed a statistically significant effect on mobilization time ($p > 0.05$). Not a single patient experienced a headache during hospital stay.

Conclusion: Our results indicate that prolonged bed rest after spinal anesthesia is becoming less common in clinical practice. The median time to mobilization was 8.5 hours, consistent with recent guidelines emphasizing that mobilization should be based on the patient's clinical status rather than a fixed time interval. Nevertheless, about one-third of patients remained in bed more than 20 hours, highlighting variability in practice and the need for further standardization of protocols in accordance with current evidence.

Keywords: spinal anesthesia, mobilization, post-dural puncture headache

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Simona Marunčić et al.

Our First 300 Fast Track Total Hips: The Review

IMPACT
Inicijativa za unaprjeđenje perioperacijske, intenzivne i akutne medicine

Our First 300 Fast Track Total Hips: The Review

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Abstract

Enhanced Recovery or "Fast Track" protocols in total hip arthroplasty (THA) have gained wide acceptance over the past decade, aiming to improve patient outcomes, reduce hospital stay, and optimize resource use. This study presents a comprehensive review of our first 300 consecutive Fast Track total hip replacements done in mixed, major urgent and elective orthopedic surgery centre, performed by one high volume surgeon, focusing on perioperative management, length of stay, early complications, and patient satisfaction.
Between 2021 and 2025, 300 patients underwent primary THA following our newly made Fast Track pathway, including preoperative education, short-acting spinal anesthetic, multimodal analgesia plan, early mobilization within 4 hours after surgery and strict discharge criteria.
Demographic data, surgical time, length of stay (LOS), readmission rate, and complications were prospectively collected and retrospectively analyzed.
The mean age was 68 years (range 21–88), with 58% female patients. The average LOS was 2.1 days, with 21% of patients discharged within 12 hours and 39% discharged within 24 hours. The 30-day readmission rate was 2.3% (all luxations), and the cumulative complication rate was 3.6%, with no increase in major events compared to conventional pathways. Ninety-five percent of patients reported high satisfaction levels and expressed confidence in early discharge.
Our experience confirms that the Fast Track protocol for THA is safe, effective, and well accepted by patients when supported by a multidisciplinary team and consistent perioperative education. Key elements for success include educated patients, standardized analgesia, early physiotherapy, and close postoperative follow-up.

Conclusion: Fast Track total hip arthroplasty significantly reduces lenght of hospital stay without compromising safety or satisfaction. With proper implementation, this approach can become the new standard of care for elective hip replacement surgery.

Keywords: Fast Track, total hip arthroplasty, new standard

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Lucija Biličić et al.

Anemia Matters: Enhancing Recovery After Hip Fracture

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

Anemia Matters: Enhancing Recovery After Hip Fracture

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Abstract

Background and Goals: Perioperative anemia is an independent risk factor for perioperative complications and is associated with increased morbidity and mortality. Elderly people with hip fractures are particularly at risk for anemia, often induced by fracture and surgery-associated blood loss. The objective of this study was to precisely quantify the incidence of anemia and red blood cell (RBC) transfusions in elderly patients before and after hip surgery, as well as to compare the rates of perioperative complications and 30-day mortality between anemic and non-anemic patients.

Materials and Methods: This retrospective data analysis reviewed the medical records of 624 patients with unilateral, nonpathological hip fractures. All underwent surgery at UHC Zagreb between January 2021 and September 2023. Patients were grouped based on their anemia status before and after surgery. Data collected included hemoglobin levels, symptoms of anemia, transfusion requirements, surgery duration, complications, and mortality.

Results and Discussion: 48 adverse complications were reported in preoperatively anemic patients, while in non-anemic patients, complications were reported in only 13 patients (0.9%). Mortality rates were also different in both groups (7 vs 2 patients (1.7% to 0.9%; p=0.016)).

Conclusion: This study's results reveal that in patients who are preoperatively anemic, perioperative complications occur more often, resulting in higher perioperative mortality.

Keywords: Anemia, hip fracture surgery, perioperative complications

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY
AND ANESTHESIA CARE

Milanka Simendić et al.

Pre-operative Cryoneurolysis for Reducing Early Post-Operative Pain and Opioid Use After Total Knee Arthroplasty: Pilot Prospective Experience

IMPACT
Inicijativa za unaprađenje perioperacijske, intenzivne i akutne medicine

Pre-operative Cryoneurolysis for Reducing Early Post-Operative Pain and Opioid Use After Total Knee Arthroplasty: Pilot Prospective Experience

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Abstract

Introduction and research aim — Cryoneurolysis involves application of extremely low temperature to a target nerve, to induce reversible Wallerian degeneration, thereby providing weeks of sustained analgesia. We aimed, as accumulating evidences suggest, that preoperative cryoneurolysis of anterior femoral cutaneous nerve and infrapatellar branch of the saphenous nerve is associated with lower pain scores and reduced opioid consumption following Total Knee Arthroplasty (TKA).

Subjects and Methods: We conducted a single-centre prospective pilot study enrolling 10 consecutive candidates for unilateral primary TKA. The procedure was performed under ultrasound guidance, starting with a diagnostic block, followed by two standardised freeze–thaw cycles 1–2 weeks pre-operatively. All patients adhered to a standardised Enhanced Recovery After Surgery (ERAS) protocol, including local infiltration analgesia and multimodal systemic analgesia. The primary outcome was cumulative opioid consumption (PACU + ward) converted to the Morphine Equivalent Dose (MED) through hospital discharge; secondary outcomes included Visual Analogue Scale (VAS), pain scores on post-operative day 1 (POD1) and length of stay. Adverse events were systematically documented. The results were compared to the results in a control group of 9 non-crioneurolysis patients included in this pilot study.

Preliminary Results: Preliminary data (n=10) demonstrated that all 10 patients exhibited significantly lower opioid utilisation compared to non-cryoneurolysis group (median MED 50,25 mg, representing a 31 % reduction below average doses of 72,8 mg) and reported reduced median VAS scores on POD1 (median 4,7 vs 4,9 in control group). No cryoneurolysis-related serious adverse events were recorded; observed transient numbness resolved spontaneously. The median length of stay was 1,7 days compared to average 1,8 days.

Conclusion: These initial data are consistent with findings from randomized and observational literature, supporting reduced pain perception and opioid exposure post-TKA with pre-operative cryoneurolysis and earlier hospital discharge. Should these findings be replicated in our planned case–control analysis, cryoneurolysis could be established ,in our department, as a practical, opioid-sparing adjunct within comprehensive ERAS pathways, potentially facilitating earlier hospital discharge and enhancing rehabilitation quality.

Keywords: cryoneurolysis, pre-operative, total knee arthroplasty , acute pain , opioid consumption

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY
AND ANESTHESIA CARE

Ivan Mirković

Cryoneurolysis for the treatment of severe gonarthralgia - experience from a county hospital

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

Cryoneurolysis for the treatment of severe gonarthralgia - experience from a county hospital

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Abstract

The work of a pain clinic in a small institution carries the same challenges as in larger ones, but with more limited human, equipment and spatial resources. In addition to regular users of our services, patients with degenerative spinal diseases, patients with neuropathic pain and oncology patients. in the last 4-5 years, in the pain clinic of our institution we can also relieve pain for patients with degenerative changes of large joints by applying ultrasound guided cryoneurolysis. By retrograde analysis of the number of procedures and their effectiveness, we obtained interesting data on this method. Application of cryoneurolysis is effective and safe method for the treatment of pain in large joints. It can be easily implemented in everyday practice, even in smaller environments.

Keywords: Cryoneurolysis, chronic pain, gonarthralgia

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ADVENT FAST TRACK SYMPOSIUM 2025:
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Marina Banović et al.

When Surgery Is Not an Option: Genicular Nerve Cryoneurolysis for Refractory Knee Pain in a Patient with Severe Cardiac Disease

When Surgery Is Not an Option: Genicular Nerve Cryoneurolysis for Refractory Knee Pain in a Patient with Severe Cardiac Disease

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Abstract

Background: Severe knee osteoarthritis (gonarthrosis) is a common source of chronic pain and disability in elderly patients. When comorbidities contraindicate surgical management and systemic analgesics are poorly tolerated, minimally invasive interventions targeting the genicular nerves offer an effective alternative.

Case Presentation: A 76-year-old female with bilateral gonarthrosis presented with severe knee pain refractory to conservative measures. Her comorbidities included atrial septal defect with left-to-right shunt, atrial fibrillation, severe tricuspid and mitral regurgitation, supraventricular and ventricular extrasystoles, hypertension and stage 3 chronic kidney disease. She had declined cardiac surgery, and the orthopedic surgeon deemed her unfit for total knee arthroplasty. The patient refused multiple pharmacologic treatments due to side effects and declined opioid therapy.

Diagnostic blocks of the superomedial, superolateral, and inferomedial genicular nerves were performed under ultrasound guidance, resulting in immediate and significant pain relief. Based on this response, cryoneurolysis of the same genicular branches was subsequently performed. The patient reported marked and sustained pain reduction with improved mobility and functional capacity, without adverse effects.

Conclusion: Genicular nerve cryoneurolysis provided effective, durable analgesia in an elderly, high-risk patient with advanced bilateral knee osteoarthritis who was not a surgical candidate and could not tolerate pharmacologic therapy. This case highlights the value of genicular nerve interventions as a safe, minimally invasive, and opioid-sparing option for pain management in complex geriatric populations.

Keywords: genicular nerve cryoneurolysis, chronic knee osteoarthritis, minimally invasive pain management

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Marina Banović et al.

Cryoneurolysis for Chronic Anterior Thigh Pain Following ACL Reconstruction: A Case Report

Cryoneurolysis for Chronic Anterior Thigh Pain Following ACL Reconstruction: A Case Report

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Abstract

Background: Persistent pain after knee surgery can result from injury or entrapment of superficial sensory nerves. Conventional therapies often provide only temporary or minimal relief. Cryoneurolysis is a minimally invasive technique that produces prolonged analgesia through reversible axonal disruption.

Case Presentation: A 45 -year-old female presented to our pain clinic with chronic pain localized above the patella and along the surgical scar. She had anterior cruciate ligament (ACL) reconstruction surgery and a subsequent revision using a quadriceps tendon graft. The pain appeared immediately after the second surgery and persisted despite physical therapy and local corticosteroids and PRP injections. We initially performed ultrasound-guided hydrodissection in the scar area which provided temporary improvement. A diagnostic block of the anterior femoral cutaneous nerve (AFCN) with ropivacaine resulted in complete but short-term pain relief, confirming the nerve as the pain generator. Subsequently, ultrasound-guided cryoneurolysis of the AFCN was performed.

Results: After the procedure, the patient experienced complete and sustained pain relief with no recurrence or motor deficits during follow-up.

Conclusion: Cryoneurolysis of the anterior femoral cutaneous nerve can provide effective, long- lasting analgesia in patients with chronic postoperative neuropathic pain following knee surgery when conservative measures have failed.

Keywords: Cryoneurolysis. chronic pain

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY
AND ANESTHESIA CARE

Mark Žižak et al.

Optimizing Blood Utilization in Orthopedic Surgery: Implementing MSBOS to Enhance Perioperative Safety and Cost Efficiency

Optimizing Blood Utilization in Orthopedic Surgery: Implementing MSBOS to Enhance Perioperative Safety and Cost Efficiency

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Abstract

Background: In orthopedic surgery, the over-ordering of red blood cell (RBC) units for elective procedures remains a persistent challenge, leading to unnecessary costs, resource strain, and transfusion-related risks. The Maximum Surgical Blood Ordering Schedule (MSBOS) serves as a core component of Patient Blood Management (PBM), aiming to standardize and reduce preoperative blood ordering based on real utilization patterns.

Objective: To evaluate the economic and clinical impact of MSBOS implementation in orthopedic surgery at a tertiary care institution.

Methods: A retrospective analysis was conducted at University Hospital Sveti Duh over a two-year period (2021.-2022.), including elective surgical cases across five departments. Blood ordering data were extracted from the Blood Bank Database. The crossmatch-to-transfusion (C/T) ratio and unit utilization were assessed. Institutional costs related to unused blood units were calculated.

Results: In 2021, 623 units were ordered and 87 transfused, yielding a C/T ratio of 7.16. In 2022, 418 units were ordered and only 38 transfused, producing a C/T ratio of 11.0, with 90.9% of units unused. These findings emphasize the over-ordering trend prior to MSBOS implementation and support the need for protocol-driven perioperative blood ordering.

Conclusion: MSBOS implementation demonstrates strong potential to reduce unnecessary blood orders, lower transfusion-related costs, and support enhanced recovery protocols without compromising safety in orthopedic care. Ongoing validation is planned. Integrating MSBOS within perioperative protocols aligns with broader ERAS and PBM strategies for orthopedic surgery and anesthesiology.

Keywords: Maximum Surgical Blood Ordering Schedule (MBOS) orthopedic surgery

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ADVENT FAST TRACK SYMPOSIUM 2025:
ENHANCING RECOVERY IN ORTHOPEDIC SURGERY AND ANESTHESIA CARE

Ivana Leko

Remimazolam and its role in Enhanced Recovery After Surgery (ERAS)

IMPACT
Inicijativa za unapređenje perioperacijske, intenzivne i akutne medicine

Remimazolam and its role in Enhanced Recovery After Surgery (ERAS)

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Abstract

Remimazolam, a novel ultra–short-acting benzodiazepine for intravenous anesthesia, is emerging as a potentially valuable agent within Enhanced Recovery After Surgery (ERAS) protocols. Its pharmacodynamic profile, characterized by rapid onset and offset, predictable context-sensitive half-life, minimal accumulation, and complete reversibility with flumazeni, allows precise titration of anesthetic depth and facilitates rapid postoperative recovery. Compared with propofol and dexmedetomidine, remimazolam has been associated with improved hemodynamic stability, reduced vasopressor requirements, and a lower incidence of perioperative hypotension, particularly in elderly or medically complex patients. Clinical studies in orthopedic populations, including total joint arthroplasty, report fast emergence from anesthesia, improved early cognitive function, and reduced postoperative nausea and vomiting. Its favorable safety and tolerability profile, combined with predictable pharmacokinetics and reversible action, support its integration into ERAS-based anesthetic strategies. While further large-scale trials are warranted, remimazolam represents a well-characterized and adaptable intravenous anesthetic option for modern perioperative orthopedic care.

Keywords: remimazolam, ultra–short-acting benzodiazepine, ERAS

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