

Contents

Foreword: Enhanced Recovery After Surgery and Perioperative Care: A Continually Evolving Approach to Surgical Care	xiii
---	-------------

Lee A. Fleisher

Preface: Enhanced Recovery After Surgery and Perioperative Medicine Driving Value-Based Surgical Care	xv
--	-----------

Michael Scott, Anton Krige and Michael P.W. Grocott

Implementing Enhanced Recovery After Surgery Across a United States Health System	1
--	----------

Paula Spencer and Michael Scott

Enhanced recovery after surgery (ERAS) is a series of evidence-based perioperative care protocols designed to improve outcomes following surgery. The concept was founded on the principle of producing a predictable quality outcome by reducing morbidity and shortening hospital stay. The key objective of ERAS is to incorporate optimized multimodal perioperative care in a variety of different surgical specialties to reduce injury and stress during the perioperative period and promote a return to normal function rapidly.

Modifying the Stress Response – Perioperative Considerations and Controversies	23
---	-----------

Leigh J.S. Kelliher and Michael Scott

The idea that perioperative outcomes may be improved through the implementation of measures that modify the surgical stress response has been around for several decades. Many techniques have been trialed with varying success. In addition, how the response to modification is measured, what constitutes a positive result and how this translates into clinical practice is the subject of debate. Modification of the stress response is the principal tenet behind the enhanced recovery after surgery (ERAS) movement which has seen the development of guidelines for perioperative care across a variety of surgical specialties bringing with them significant improvements in outcomes.

Opioid-Sparing Perioperative Analgesia Within Enhanced Recovery Programs	35
---	-----------

Matthew D. McEvoy, Britany L. Raymond, and Anton Krige

Opioid-based analgesia in the perioperative period can provide excellent pain control, but this approach exposes the patient to avoidable side effects and possible harm. Optimal analgesia, an approach that targets the fastest functional recovery with adequate pain control while minimizing side effects, can be achieved with opioid minimization. Many different options for nonopioid multimodal analgesia exist and have been shown to be efficacious, with certain modalities being more beneficial for specific

surgeries. This review will present the evidence and practical tips for these management strategies.

Fluid and Hemodynamics

59

W. Brenton French and Michael Scott

Several components of an Enhanced Recovery After Surgery (ERAS) pathway act to improve and simplify perioperative fluid and hemodynamic therapy. Modern perioperative fluid management has shifted away from the liberal fluid therapy and toward more individualized approaches. Clinical evidence has also emphasized the importance of maintaining adequate mean arterial pressure and avoiding intraoperative hypotension. Goal-directed hemodynamic therapy (GDHT), or the use of cardiac output monitoring to guide fluid and vasopressor use, has been shown to reduce complications, but its role within ERAS pathways is likely best-suited to high-risk patients or those undergoing high-risk procedures. This article reviews the mechanisms by which ERAS pathways aid the provider in hemodynamic management, reviews trends, and evidence regarding fluid and hemodynamic therapy approaches, and provides guidance on the practical implementation of these concepts within ERAS pathways.

Hip and Knee Arthroplasty

73

Ellen M. Soffin and Thomas W. Wainwright

Variation in care is associated with variation in outcomes after total joint arthroplasty (TJA). Accordingly, much research into enhanced recovery efficacy for TJA has been devoted to linking standardization with better outcomes. This article focuses on recent advances suggesting that variation within a set of core protocol elements may be less important than providing the core elements within enhanced recovery pathways for TJA. Provided the core elements are associated with benefits for patients and health care system outcomes, variation in the details of their provision may contribute to a pathway's success. This article provides an updated review of the literature.

Anaesthesia for Hepatic Resection Surgery

91

Anton Krige and Leigh J.S. Kelliher

This article will focus on the perioperative management of hepatic resection for colorectal cancer (CRC) liver metastases (CLRM) (the liver is the dominant metastatic site for CRC) within the context of the Enhanced Recovery After Surgery (ERAS) paradigm. It discusses the epidemiology and outcomes along with the history of hepatic resection surgery and pertinent anatomy. The discussion of the preoperative phase includes patient selection, assessment of liver functional status, and new developments in prehabilitation. The intraoperative phase details developments in surgical and anesthetic techniques to minimize liver hemorrhage and reduce the risk of postoperative hepatic failure. Newer analgesic options are included. Management of potential complications is outlined in the postoperative section followed by a description of current evidence for ERAS and future directions.

Anaesthesia for Pancreatic Surgery 107

Leigh J.S. Kelliher and Anton Krige

This article provides a broad perspective on the salient perioperative issues encountered when caring for patients undergoing pancreatic surgery in the setting of pancreatic cancer. It describes the epidemiology of pancreatic cancer, the indications for and evolution of pancreatic resection surgery, the challenges faced perioperatively including patient selection, optimization, anesthetic considerations, postoperative analgesia, fluid management, and nutrition and discusses some of the common complications and their management. It finishes by outlining the future directions for research and development required to continue improving outcomes for these patients.

Anesthesia and Enhanced Recovery After Surgery in Bariatric Surgery 119

Christa L. Riley

The Enhanced Recovery After Surgery Society published guidelines for bariatric surgery reviewing the evidence and providing specific care recommendations. These guidelines emphasize preoperative nutrition, multimodal analgesia, postoperative nausea and vomiting prophylaxis, anesthetic technique, nutrition, and mobilization. Several studies have since evaluated these pathways, showing them to be safe and effective at decreasing hospital length of stay and postoperative nausea and vomiting. This article emphasizes anesthetic management in the perioperative period and outlines future directions, including the application of Enhanced Recovery After Surgery principles in patients with extreme obesity, diabetes, and metabolic disease and standardization of the pathways to decrease heterogeneity.

Enhanced Recovery After Cardiac Surgery 143

Mike Charlesworth and Andrew Klein

The aims of “Fast track” cardiac anesthesia including shortening time to tracheal extubation and to hospital discharge in selected patients. The evidence is weak and recommendations are mostly based on observational, nonrandomized data and expert opinion. The majority of outcomes studied include: time to tracheal extubation, hospital/ICU length of stay, procedure-related financial costs, and the type/amount of opioids used in the peri-operative period. There should be a shift in focus to generating higher quality evidence supporting the use of enhanced recovery protocols in cardiac surgical patients and finding ways to tailor enhanced recovery principles to all cardiac surgical patients. Research should focus on the quality of care for individual patients and the delivery of health care to the public.

Updates in Enhanced Recovery Pathways for Gynecologic Surgery 157

Andres Zorrilla-Vaca, Javier D. Lasala, and Gabriel E. Mena

Gynecologic surgery encompasses over a quarter of inpatient surgical procedures for US women, and current projections estimate an increase of the US female population by nearly 50% in 2050. Over the last decade, US hospitals have embraced enhanced recovery pathways in many

specialties. They have increasingly been used in multiple institutions worldwide, becoming the standard of care for patient optimization. According to the last updated enhanced recovery after surgery (ERAS) guideline published in 2019, there are several new considerations behind each practice in ERAS protocols. This article discusses the most updated evidence regarding ERAS programs for gynecologic surgery.

Anaesthesia for Major Urological Surgery

175

Jaishel Patel and Christopher N. Jones

This article focuses on the anesthetic considerations for major cancer urology surgeries such as cystectomies, nephrectomies, and radical prostatectomies. It aims to explore the anesthetic considerations for both open and minimally invasive techniques.

Emergency Laparotomy

199

Geeta Aggarwal, Michael Scott, and Carol J. Peden

Emergency laparotomy is a high-risk surgical procedure with mortality and morbidity up to 10 times higher than for a similar procedure performed electively. An enhanced recovery approach has been shown to improve outcomes. A focus on rapid correction of underlying deranged acute physiology and proactive management of conditions associated with aging such as frailty and delirium are key. Patients are at high risk of complications and prevention and avoidance of failure to rescue are essential to improve outcomes. Other enhanced recovery components such as opioid-sparing analgesia and early postoperative mobilization are beneficial.