

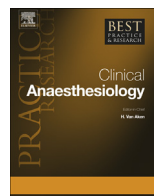


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Enhanced recovery after surgery (ERAS) and its applicability for major spine surgery



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This article examines the relevance of applying the Enhanced Recovery after Surgery (ERAS) approach to patients undergoing major spinal surgery. The history of ERAS, details of the components of the approach and the underlying rationale are explained. Evidence on outcomes achieved by using the ERAS approach in other orthopaedic and complex surgical procedures is then outlined. Data on major spinal surgery rates and current practice are reviewed; the rationale for using ERAS in major spinal surgery is discussed, and potential challenges to its adoption are acknowledged. A thorough literature search is then undertaken to examine the use of ERAS pathways in major spinal surgery, and the results are presented. The article then reviews the evidence to support the application of individual ERAS components such as patient education, multimodal pain management, surgical approach, blood loss, nutrition and physiotherapy in major spinal surgery, and discusses the need for further robust research to be undertaken. The article concludes that given the rising costs of surgery and levels of patient dissatisfaction, an ERAS pathway that focuses on

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optimising clinical procedures by adopting evidence-based practice and improving logistics should enable major spinal surgery patients to recover more quickly with lower rates of morbidity and improved longer-term outcomes.

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Introduction to enhanced recovery after surgery

The concept of Enhanced Recovery after Surgery (ERAS), also called fast-track, accelerated or rapid recovery, was first introduced by Henrik Kehlet [1]. He introduced an evidence-based approach to care, designed to prepare patients for, and reduce the impact of surgery, allowing them to recover more quickly.

In colorectal surgery patients, Kehlet found that organ dysfunction (surgical stress), pain, nausea, vomiting, ileus, immobilisation, cognitive dysfunction, fatigue, traditions (e.g. drains) and logistical issues all contributed to slowing down post-operative recovery [2,3]. He concluded that whilst no single technique or drug regimen would be able to eliminate these contributors to post-operative morbidity, a better recovery could be achieved with a multimodal approach focusing on modulating the surgical stress response. This led to the introduction of enhanced recovery pathways after colorectal surgery as a successful standardised evidence-based approach in which a number of individual interventions are delivered together for improving clinical outcomes and healthcare resource utilisation [4].

Given the quality improvements found by Adamina et al. [4] in their meta-analysis with regard to ERAS and colorectal surgery, interest in enhanced recovery pathways has increased in the recent years due to the economic challenges currently faced by all healthcare providers. European countries have been quick to adopt and implement ERAS protocols. For example, in the United Kingdom (UK) the National Health Service (NHS) has been keen on implementing enhanced recovery programmes as a way to achieve productivity gains and cost savings. A recent review of the effectiveness of these programmes [5] concluded that there was consistent evidence that the programmes could reduce length of hospital stay without increasing readmissions. However, the authors cautioned that the extent to which the introduction of an enhanced recovery pathway could reduce costs will depend on the length of stay (LOS) already achieved under the existing pathway.

Given the positive results of implementing ERAS protocols, societies such as the ERAS Society (<http://erassociety.org>), ERAS Society (UK) (<http://www.erasuk.net/>), and in the past year, the American Society for Enhanced Recovery (ASER) (<http://enhancedrecovery.org/>) have been formed to promote the practice of enhanced recovery. The ERAS Society has been at the forefront of spreading the adoption of ERAS internationally and has issued guidelines for complex surgical procedures such as pancreaticoduodenectomy [6], gastrectomy and [7] elective colonic [8] and rectal/pelvic surgery [9] with future guidelines for more surgical procedures planned.

Components of ERAS pathways

Enhanced recovery pathways combine optimised clinical procedures with improved logistics [10] and should include the prehospital and post-discharge stages as well. The historical and previously described multimodal concept of an enhanced pathway is provided in Fig. 1 [11].

In an orthopaedic ERAS pathway at the preoperative stage, where possible, a patient with comorbidities should be optimised so that they have the best possible fitness for surgery, and primary care providers should be well informed on pain treatment and other factors of post-operative care once a patient has left hospital. Preoperative education is accepted as an essential part of practice [12] and should include informing patients on how long they can expect to be in hospital, agreeing discharge criteria, managing expectations and reducing anxiety [10].

Once in hospital, a number of clinical aspects should be included within the pathway, such as a multimodal approach to anaesthesia and analgesia, which allows early mobilisation and rehabilitation.

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