Enhanced Recovery After Shoulder Arthroplasty

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KEYWORDS

• Shoulder arthroplasty • Enhanced recovery after surgery • Multimodal analgesia
• Regional anesthesia • Perineural catheter • Perioperative surgical home

KEY POINTS

- Enhanced recovery protocols in joint arthroplasty reduce morbidity and mortality, readmission rates, and length of stay while improving analgesia and patient satisfaction.
- Protocols for shoulder arthroplasty demonstrate benefits similar to lower extremity arthroplasty based on preliminary data.
- Despite success, universal protocol adoption is lacking.
- Future protocols must focus on patient-centered metrics and functional outcomes beyond the immediate postoperative period.

INTRODUCTION

Enhanced recovery after surgery (ERAS) is a patient-centered, evidence-based, multidisciplinary collaborative management approach that charts a patient's course before, during, and after surgery.[1] ERAS should be procedure-specific; based on the recovery goals after each type of surgery; and designed with aims to decrease the perioperative stress response, optimize patients' physiologic function, and speed recovery.[2] The first ERAS protocols started in colorectal surgery, but ERAS now includes almost all surgical subspecialties, including orthopedic surgery. Joint arthroplasty surgeries are costly not only to the patient but also to the health care system.[3] Although total joint arthroplasty equipment, techniques, and the concomitant anesthesia have evolved, complications leading to significant physiologic derangements still occur. This departure from homeostasis negatively impacts recovery and function, and ERAS protocols attempt to eliminate these problems.[4,5]

ENHANCED RECOVERY AFTER SURGERY: GENERAL PRINCIPLES

Medical centers around the world have been actively adopting protocols pioneered by Dr Kehlet and colleagues[1,2] dedicated to improving health care quality. They created a

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structured clinical pathway for colorectal surgery and then reviewed its effectiveness after implementation. By auditing the outcome data for their pathway, Kehlet and colleagues[2] demonstrated a reduction in complications, hospital length of stay (LOS), and hospitalization cost. These pathways were designed to structure patient care with evidence-based interventions that improve perioperative experience and reduce unnecessary variations in care, time to discharge, and complications. The overarching goals of the colorectal ERAS protocol were to attenuate the physiologic disruptions from surgery through the use of goal-directed fluid therapy, modified bowel preparation, lung-protective ventilation, early mobilization, adequate warming, and multimodal analgesics and prophylaxis against postoperative nausea and vomiting (PONV).[6] Other goals include decreased morbidity and mortality,[7] decreased opioid consumption,[8] and increased patient satisfaction.[9] ERAS protocols are multidisciplinary in nature, encouraging collaboration among surgeons, anesthesiologists, nurses, physical therapists, and hospital administrators. Full commitment is needed from patients and providers, because lack of protocol adherence results in suboptimal management and failure to meet end points. **Fig. 1** illustrates how pathways are broken down into phases: preadmission, preoperative, intraoperative, and postoperative.

Given the success in colorectal surgery, other disciplines have adopted enhanced recovery protocols including gynecology, urology, and orthopedics. In knee and hip arthroplasty, clinical pathways focused around regional anesthesia and multimodal analgesia were superior to traditional general anesthesia (GA) and an opioid-centric model.[10] Hebl and colleagues[11] demonstrated the merits of a detailed protocol in the early 2000s for hip and knee arthroplasty. As early adopters, they reported decreases in total knee and hip arthroplasty hospital LOS and costs, especially in patients who have American Society of Anesthesiologists (ASA) physical status of 3 and above.[12] Moreover, the Mayo Clinic's Total Joint Regional Anesthesia Clinical Pathway states that the cornerstone to an effective protocol is peripheral nerve blockade and multimodal analgesia.[13]

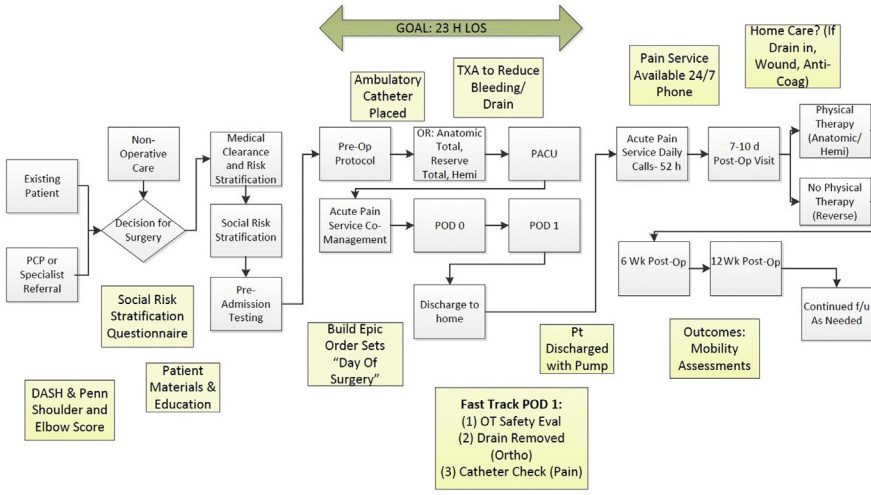

Fig. 1. Shoulder arthroplasty enhanced recovery protocol pathway. OR, operating room; OT, occupational therapy; PACU, postanesthesia care unit; PCP, primary care physician; POD, postop day; ShARP, Shoulder Arthroplasty enhanced Recovery Protocol; TXA, tranexamic acid.