Which Outcomes Related to Regional Anesthesia Are Most Important for Orthopedic Surgery Patients?

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KEYWORDS

• Regional anesthesia • Outcomes • Pain management • Complications
• Economic advantages • Hospital stay • Functional outcome

KEY POINTS

- There is growing evidence that the use of regional anesthesia and analgesia contributes to improved outcomes in orthopedic patients with various important benefits for all stakeholders.
- Important short-term factors include comfort and adequate analgesia before, during and after the procedure; lack of unpleasant side effects; good operative conditions; optimized rehabilitation; a low complication profile; fast recovery; short hospital stay; and high patient satisfaction.
- Functional outcome is of extremely high importance to the patient as well as the practitioner because the primary goal of orthopedic surgery is the restoration or preservation of function and it ultimately constitutes an important determinant of the patients' quality of life.
- As evidenced by numerous available studies, regional anesthesia conveys many of these advantages and contributes to increased safety by decreasing complication incidence.
- Results with regard to the long-term functional impact of regional anesthesia are scarce and inconsistent at this time and high-quality research is warranted to more clearly define its role.

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INTRODUCTION

Regional anesthesia has gained considerable interest across virtually all surgical disciplines. Since the clinical introduction of local anesthetics in the 1800s, countless regional anesthetic techniques have been developed and popularized. The ability to provide analgesia in a selective fashion targeted specifically to surgical sites has led to the desire to increase knowledge about the mechanism of action as well as the subsequent effects associated with use of these techniques. Particularly for orthopedic surgery, regional anesthesia has come to constitute an indispensible part of the anesthesiologist's armamentarium. An increasing body of evidence documents the beneficial outcomes when regional anesthesia is applied.[1] Importantly, more focused and sustained pain control frequently obviates or reduces the need for systemic analgesic management. Beyond facilitated pain control, analgesic-related side effects such as respiratory and cardiovascular depression, gastrointestinal complications, sedation, and end-organ damage seem to be decreased.[2,3] These effects can prove critical in postoperative patients, allowing for the prevention of potentially life-threatening complications, improved patient comfort, and early mobilization. On a broader scale, regional anesthesia has been associated with a decrease in morbidity and mortality, particularly in patients with a high comorbidity burden and in the elderly.[4] Moreover, it has been linked to lower resource expenditure through earlier discharge, better short-term functional outcomes, lower rates of advanced service requirements (eg, critical care admission), transfusion need, and lower complication rates affecting virtually all organ systems. Importantly, all these effects have been observed while associated with very low risk for adverse events related to the regional anesthetics themselves.[5–7] However, there is considerable discussion as to which of these outcomes carry the most weight, either at the level of the individual patient or provider or from a healthcare management and public health perspective. This article briefly recapitulates recent literature pertaining to these subjects and presents an overview of various endpoints and their relevance, including pain management, morbidity and mortality, resource use, economic endpoints such as cost and length-of-stay, patient comfort and satisfaction, and functional outcomes.

PAIN MANAGEMENT

The most widely recognized indication of regional anesthesia and analgesia remains perioperative pain control.[8] Various techniques represent viable and frequently used approaches, particularly for analgesic management of orthopedic surgery on the extremities and pelvis, including major upper and lower extremity joint surgery, osteotomy and osteosynthesis, fracture treatment, and tumor and soft tissue surgery. It is less frequently used for spine surgical procedures but interest in regional anesthetic techniques in this population of patient is increasing.[9] It is obvious that various procedures are associated with sizable differences in invasiveness, spanning from diagnostic arthroscopies to simultaneous bilateral joint replacements or massive trauma, and are thus subject to different levels of pain, surgical stress, and impending complications. Due to their high use and drastically increasing demand,[10] total hip arthroplasty (THA) or total knee arthroplasty (TKA) are often chosen for comparative analyses of anesthetic techniques and associated outcomes including pain. In most studies, regional anesthesia is either compared with general anesthesia and systemic analgesia, or various regional anesthetic techniques are compared with each other. The spectrum of such approaches encompasses neuraxial analgesia (spinal, epidural, or combined spinal epidural anesthesia) as well as a large number of peripheral nerve blocks, either as a single injection or with insertion of a catheter at the injection site,