

Outpatient Pediatric Orthopedic Surgery

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KEYWORDS

- Pediatrics orthopedic surgery • Day surgery • Ambulatory surgery • Perioperative pathways
- Regional anesthesia

KEY POINTS

- Interest in pediatric outpatient surgery as a safe and efficient alternative to inpatient perioperative management is increasing.
- Evidence suggests that in appropriately selected patients, outpatient surgery decreases costs and avoids detrimental psychological effects of hospital admission.
- Team expertise in the comprehensive perioperative management of pediatric patient and family education is essential for successful outpatient postoperative management.
- Outpatient pediatric orthopedic surgery should be considered in consultation with patients and families, in the context of appropriate patient and surgical factors.

INTRODUCTION

Outpatient surgery (also known to as ambulatory surgery, same-day surgery, or day surgery) refers to a surgical procedure that is performed without an overnight stay in a hospital.¹ As the modern health care system evolves, emphasis has been placed on delivering high-quality care in the most safe and efficient manner possible. In light of this, there has been an evolving focus on outpatient procedures in many orthopedic interventions over the past 30 years.^{1,2} Although most prevalent in adult orthopedic surgery, this trend has been observed in the pediatric population as well.^{3,4}

As experience with outpatient surgery increases, selection criteria has widened.⁵ Outpatient surgery is an attractive option for a variety of procedures that can lead to decreased individual and societal costs compared with inpatient hospitalization while achieving equivalent health outcomes.¹ The detrimental

psychosocial effects of inpatient hospitalization on children may also be mitigated by an outpatient surgery approach.

Despite the potential benefits of outpatient surgery, there are several limitations that are particularly relevant to the heterogeneous patient population one encounters in pediatric orthopedics. This review summarizes the most recent literature published on the role of pediatric outpatient orthopedic surgery, including current practice trends and outcomes. Strategies for integrating outpatient procedures into a pediatric orthopedic practice are discussed.

POTENTIAL ADVANTAGES OF OUTPATIENT SURGERY

Outpatient surgery has numerous potential benefits when compared with inpatient care. In the current health care environment, systems are increasingly focused on improving *value* delivery by decreasing the cost of treatment while

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optimizing the quality of care delivered.⁶ Outpatient surgery is particularly advantageous in this respect. Costs for outpatient orthopedic procedures are estimated to be 17% to 68% less than equivalent procedures with an inpatient stay.^{1,5} Savings associated with outpatient procedures are attributed to lack of overnight admission charges and costs associated with inpatient care services, such as facility depreciation and maintenance, medications, nursing, and therapy services.¹

Outpatient surgery may have particular psychological benefits for the pediatric population. Continuous support of a nurturing family is indispensable to a child's normal psychological development.⁷ Parental separation during hospitalization has been associated with temporary and permanent detrimental effects on development.⁸ Outpatient surgery may decrease the psychosocial impact of inpatient hospitalization and parental separation.⁹ This decreased impact is particularly relevant to patients with musculoskeletal disorders, such as patients with connective tissue disorders or neuromuscular diseases, who may require multiple surgical procedures and anesthetics over the course of their development.⁷

In addition to the economic and psychological advantages, outpatient surgery has the potential to decrease other risks of hospitalization, such as nosocomial infection,⁹ although this has not been demonstrated in clinical studies.

Surgeons may also benefit from increased outpatient procedures by creating less scheduling delays and allowing more autonomy.¹⁰ These features are advantageous to hospitals as well in terms of bed and resource allocation.

CHALLENGES IN PEDIATRIC ORTHOPEDIC OUTPATIENT SURGERY

Although there are numerous advantages of outpatient orthopedic surgery in the pediatric population, several challenges exist to its universal implementation. These challenges may be medical, social, procedural, or environmental in nature.

Pediatric orthopedic patients represent a heterogeneous population with a variety of comorbidities. The anesthetic care of infants and young children is fundamentally different from those of adults and may require different specialized equipment and/or care providers.⁸ Outpatient surgery centers that are not dedicated pediatric facilities may not be equipped with the appropriate resources to safely take care of pediatric patients. The exception to this

could be older adolescent patients who may be physiologically similar to an adult.

A limiting factor in the practice of pediatric orthopedic outpatient surgery is achieving adequate pain control in the perioperative period. Although the increased rate of outpatient orthopedic surgery is in large part due to improved techniques for perioperative pain management, including regional anesthesia,¹¹ numerous studies and reviews have reported a significant percentage of patients with inadequate analgesia following several common ambulatory surgeries.^{9,12-15} Pain remains difficult to assess objectively, especially in younger children; pediatric-specific pain teams, pediatric-specific pain assessment tools, and child-life specialists have been advocated as ways to help combat this challenge.¹⁶ As opposed to inpatient hospitalization where pain can be regularly evaluated by pediatric-trained professionals and treated with a wide armamentarium of analgesics (oral and intravenous), pain evaluation and medication administration in outpatient surgery relies on a parent or caregiver who may have poor health literacy.⁹ Automated mobile phone text messaging may offer providers opportunities to monitor postoperative pain and other symptoms as the volume of outpatient surgery increases.¹⁷

SUITABILITY OF OUTPATIENT SURGERY

Patient Factors

Preoperative screening is paramount to improving patient satisfaction and minimizing complications (including readmissions) with outpatient pediatric surgery.¹⁸ A thorough history and physical is mandatory before any procedure. The American Society of Anesthesiologists' (ASA) physical status classification system (Table 1) may be used to classify patients according to the severity and stability of their medical comorbidities. ASA 1 and 2 patients are generally good candidates for outpatient surgery. Advanced preoperative evaluation by a member of the anesthesia team can help delineate a patient's medical suitability for outpatient surgery in equivocal case. ASA 3 patients with stable conditions may be candidates for outpatient procedures but are probably better cared for in centers with a capability for inpatient admission in the event of any perioperative complications. Overnight observation should be planned for ASA 4 patients.¹⁹ Because of the complex medical comorbidities of many patients with orthopedic conditions, including pediatric patients, there will always be cases whereby care and

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