

# Review on Ethical Dilemmas in Pediatric Orthopedic Care

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## ABSTRACT

Pediatric orthopedic care involves diagnosing and treating musculoskeletal issues in children, presenting unique ethical dilemmas that require careful navigation to ensure optimal outcomes. This review delves into the multifaceted ethical considerations that underpin pediatric orthopedic care, emphasizing the importance of tailored diagnoses, early intervention, and comprehensive treatment strategies for young patients. Anesthesia services are crucial in pediatric orthopedic procedures, ensuring patient comfort and safety during interventions. Ethical principles guide operative management in pediatric surgery, addressing patient consent, potential harm, and professionalism to uphold the highest standards of care. The review explores potential ethical dilemmas related to beneficence, nonmaleficence, informed consent, and safeguarding vulnerable populations in pediatric orthopedic practice. Collaborative decision-making involving patients, caregivers, and clinicians are essential to prevent ethical pitfalls and ensure the delivery of ethical care in managing complex conditions. By examining these ethical challenges, this review aims to enhance understanding of the ethical landscape in pediatric orthopedic care and promote shared decision-making processes to optimize patient outcomes and uphold ethical standards in the field.

**Key-words:** Ethical challenges, Ethical dilemmas, Ethical principles, Pediatric orthopedic

## INTRODUCTION

Pediatric orthopedic care diagnoses and treats musculoskeletal issues in children and young people, including congenital deformities, growth abnormalities, injuries, and fractures. It involves tailored differential diagnoses based on age, early detection, and treatment initiation for optimal long-term outcomes<sup>[1,2]</sup>. Care for pediatric orthopedic patients may involve immobilization with plaster casts, external fixators, or skeletal pins, along with neurovascular assessments to monitor limb function and circulation<sup>[3]</sup>. Anesthesia services are crucial for procedures like fracture treatments, diagnostic tests, and sedation, with some cases suitable for day surgery<sup>[4]</sup>.

In cases of trauma, orthopedic injuries are common but rarely life-threatening. Yet, they can lead to long-term morbidity, emphasizing the importance of comprehensive musculoskeletal management in children with multiple injuries<sup>[5]</sup>.

Ethical considerations are crucial in pediatric orthopedic care, especially when dealing with unique patient populations<sup>[6]</sup>. Surgeons introducing new procedures must prioritize ethical aspects, such as patient consent, potential harm, and available resources, to ensure safe and effective care<sup>[6,7]</sup>. Additionally, ethical principles guide operative management in pediatric surgery, addressing issues like surgical error, professionalism, and novel procedures, including those for transgender patients<sup>[8]</sup>. Overall, ethical considerations are integral in providing optimal care and respecting the diverse needs of pediatric orthopedic patients.

Potential ethical dilemmas in pediatric orthopedic care include beneficence, nonmaleficence, informed consent, and protecting the vulnerable population. Pediatric orthopedic procedures may cause pain, raising concerns

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about when the pain becomes harm and defining minimal risk<sup>[6]</sup>. Determining appropriate informed consent in children and managing differing views on the child's best interest can be challenging<sup>[9]</sup>. To address these dilemmas, a collaborative effort in decision-making involving patients, caregivers, and clinicians is crucial to prevent at own risk (AOR) discharges and ensure ethical practices in managing potentially life-saving conditions<sup>[10]</sup>. Surgeons should systematically study new procedures, standardize their introduction, and report outcomes to refine indications and minimize risks for pediatric patients<sup>[11]</sup>.

Surgeons must navigate dilemmas such as obtaining informed consent from pediatric patients and their families, performing cosmetic surgery, caring for impaired patients, treating injured young athletes, and meeting pediatric orthopaedic care demands<sup>[10]</sup>. Collaborative decision-making respecting autonomy, competence, truth, confidentiality, and avoiding paternalism is crucial to prevent situations like "at own risk" discharges for alternative treatments<sup>[10]</sup>. By adhering to ethical principles, engaging in systematic study of new procedures, and promoting standardized reporting, surgeons can enhance care quality and minimize risks in pediatric orthopedic practice. The escalating complexity of healthcare creates safety issues, leading to ethical challenges for clinicians and administrators<sup>[12]</sup>. In a society where stable ethical values are questioned, rediscovering abandoned ethical values is essential for improving patient-physician relationships and social health<sup>[11]</sup>. Addressing these dilemmas ethically is vital for ensuring the well-being of pediatric patients, their families, and society.

This review aims to explore and analyze the ethical dilemmas that arise in pediatric orthopedic care. This review will delve into the complex ethical issues faced by healthcare providers, patients, and families in pediatric orthopedics. By examining various scenarios and perspectives, this review aims to comprehensively understand the ethical challenges inherent in caring for pediatric orthopedic patients.

Ethical dilemmas can arise from various aspects of pediatric orthopedic care, including informed consent, treatment decision-making, resource allocation, and end-of-life care.

**Informed Consent-** In pediatric orthopedic care, informed consent is crucial in ensuring ethical and effective treatment. Informed consent is a process, not just a form, involving providing patients or legal guardians with comprehensive information about proposed interventions, including risks and benefits, to enable them to make informed decisions<sup>[13,14]</sup>. This process is particularly sensitive in pediatrics, where minors lack independent decision-making capacity, necessitating parental or legal representative consent, with children aged 14 and above expressing assent<sup>[15,16]</sup>. Informed consent in pediatric orthopedic care should encompass detailed explanations of diagnoses, treatments, potential outcomes, and the involvement of all stakeholders-pediatricians, children, and parents-in decision-making processes<sup>[17]</sup>. Ultimately, ensuring informed consent in pediatric orthopedic care upholds the rights of young patients and promotes the ethical medical practice.

Obtaining informed consent from minors and their guardians poses various challenges. Researchers face obstacles such as inadequate knowledge in designing consent forms, participant reluctance to sign, ensuring confidentiality, and effectively communicating risks and benefits<sup>[18]</sup>. In the pediatric setting, the understanding of patients, parental stress, and poor comprehension of consent information further complicate the process<sup>[14]</sup>. Legal systems struggle with defining the validity of consent, leading to ineffective consent that may harm minors' interests<sup>[19]</sup>. In pediatric drug research, issues arise from the lack of regulatory clarity, the delicate balance between parental consent and child permission, and the necessity of providing understandable information to guardians<sup>[20]</sup>. Additionally, unique scenarios in child abuse research raise questions about consent, permission, and the potential impact of disclosing study purposes on subject participation<sup>[21]</sup>.

In pediatric orthopedics, ethical implications of informed consent are paramount, as highlighted in various research papers. Obtaining informed consent from pediatric patients and their families is crucial, especially when considering surgery, research, or cosmetic procedures<sup>[22]</sup>. It is essential to involve minor patients in the decision-making process according to their understanding level, with the final consent typically belonging to parents or legal tutors in a written form<sup>[23]</sup>. The ethical practice of medicine in pediatric anesthesia

emphasizes the importance of informed consent due to potential adverse effects on brain development from anesthesia administration to children under three years old<sup>[24]</sup>. Addressing legal and ethical dilemmas in informed consent, particularly in pediatric cases, requires balancing patient wishes and the physician's duty to avoid harm, emphasizing the significance of moral decision-making in pediatric orthopedic care<sup>[25]</sup>.

**Treatment Decision-Making-** Treatment decision-making for pediatric orthopedic conditions involves various complexities. Pediatric orthopedic surgeons often rely on clinical experience and first principles rather than scientific evidence when making decisions. The use of magnetic resonance imaging (MRI) in conditions like Legg-Calvé-Perthes disease (LCPD) can significantly impact treatment choices, leading to a shift towards more surgical interventions<sup>[26]</sup>. Additionally, ethical considerations play a crucial role in decision-making, especially when dealing with pediatric patients and their families, where dilemmas such as obtaining informed consent, performing cosmetic surgery, and meeting the demand for care arise<sup>[27]</sup>. Furthermore, the current approach to treatment decision-making in juvenile idiopathic arthritis (JIA) involves clinicians predominantly driving the decisions, with family preferences being more influential in treatment discontinuation rather than initiation<sup>[23]</sup>. These factors collectively highlight the multifaceted nature of treatment decision-making in pediatric orthopedic conditions, emphasizing the need for evidence-based practices and shared decision-making processes.

**Factors influencing treatment decisions-** In pediatric orthopedics, several factors can influence treatment decisions for young patients. These factors encompass a range of considerations that orthopedic surgeons must consider to provide the best possible care. Some of the key factors influencing treatment decisions in pediatric orthopedics include (Table 1):

Parental preferences are crucial in treatment decisions, especially in pediatric orthopedics. Studies have shown that factors such as impaired emotional well-being, parental influence, and malocclusion severity significantly influence treatment demand in preadolescents and adolescents<sup>[28,23]</sup>. Additionally, parents value being involved in decision-making, having

enough time, and being a good parent when making treatment-related decisions for their children with poor-prognosis cancer<sup>[28,29]</sup>. The decision-making process is complex, influenced by factors like hope for a cure, fear of the child dying, and uncertainty, with preferences varying among parents and sometimes conflicting, particularly when balancing the desire for continued therapy with maintaining the child's quality of life<sup>[30]</sup>. Understanding these parental values and preferences is essential for healthcare professionals to enhance discussions and adequately support parents facing such challenging decisions<sup>[31]</sup>.

**Child autonomy-** Factors influencing treatment decisions in pediatric orthopedics, particularly regarding child autonomy, are multifaceted. Studies emphasize the importance of involving children in decision-making to enhance their abilities and autonomy<sup>[32]</sup>. The pediatrician-child relationship, influenced by parental authority and respect for the child's moral equality, is crucial in determining the level of autonomy granted to the child in healthcare decisions<sup>[33]</sup>. Legal frameworks, such as Mexican law, emphasize the need to respect children's opinions and provide them with information, impacting how treatment decisions are made in cases like alterations of sex differentiation<sup>[33,34]</sup>. Understanding the child's ability to reason, their experiences and their comprehension of the subject are vital factors that affect their decision-making capabilities in medical settings<sup>[35]</sup>. Ultimately, a balance must be struck between parental expectations, medical guidance, and the child's competency to ensure ethical and effective treatment decisions in pediatric orthopedics.

**Medical necessity-** Various factors, including medical necessity, evidence-based practices, and individual patient considerations influence treatment decisions in pediatric orthopedics. Research has shown that decisions made by pediatric orthopedic surgeons often rely on a combination of factors such as experience, anecdotal evidence, and adherence to first principles<sup>[36]</sup>. Incorporating patient preferences and values in treatment decision-making processes is highlighted, emphasizing the need for shared decision-making approaches that consider the unique circumstances of each patient<sup>[37]</sup>. Additionally, the availability of evidence-based guidelines and clinical pathways can help

improve the quality of care and patient safety in pediatric orthopedic surgery by minimizing unwarranted variations in treatment approaches [38]. A comprehensive understanding of these factors is crucial in developing individualized and effective treatment plans for pediatric orthopedic conditions, ensuring optimal outcomes for young patients.

**Table 1:** Factors Influencing Informed Consent in Pediatric Orthopedic Care

Factors	Description
Parental preferences	Parents play a crucial role in decision-making for pediatric patients, influencing consent decisions based on their beliefs, values, and understanding of the treatment.
Child autonomy	Recognizing and respecting the child's autonomy is essential in pediatric care, especially as the child matures and can participate in decision-making processes.
Medical necessity	The medical team must communicate the necessity of the proposed treatment to parents and children to ensure informed consent is obtained.

**Resource Allocation-** The ethical issues related to resource allocation in pediatric orthopedics are crucial, especially in times of crisis like the COVID-19 pandemic, where medical resources are finite [39]. Orthopedic surgeons face dilemmas in balancing the best interests of individual patients with the broader community's needs while rationing care [40,41]. The principles of distributive justice challenge traditional medical paradigms, leading to new paradigms that aim to reconcile these competing obligations [42]. Models for resource allocation must consider different types of resources, local availability, and societal preferences, emphasizing the importance of fair allocation and prioritization of healthcare resources. Understanding these ethical considerations is essential for pediatric orthopedic surgeons to navigate complex resource allocation decisions effectively.

**Strategies for ethically allocating resources in pediatric orthopaedics-** Ethical allocation of resources is crucial to

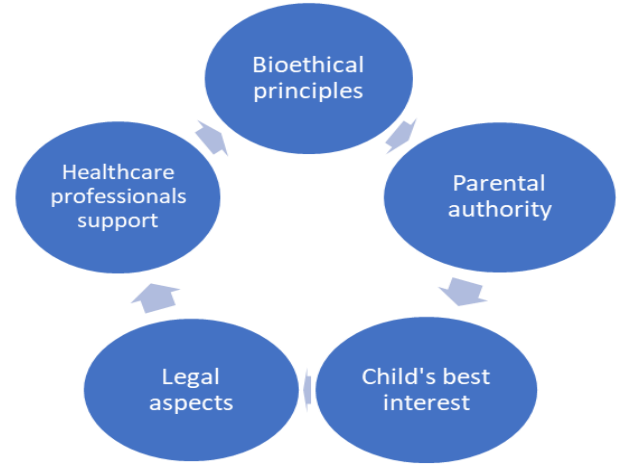
ensure equitable care for all patients. Here are some strategies that can be employed (Table 2)-

**Utilization of professional interpreters-** In pediatric orthopaedics, an ethical strategy for resource allocation involves utilizing professional interpreters to ensure effective communication with marginalized patients, including those with limited English proficiency (LEP) [43]. This approach aligns with the broader challenge of balancing individual patient needs with the sustainability of the healthcare system, as highlighted in research on resource allocation by orthopaedic surgeons [44]. By incorporating professional interpreters, clinicians can enhance shared decision-making, promote patient autonomy, and facilitate mutual understanding, ultimately improving health equity for patients from diverse backgrounds or with LEP [45]. Additionally, considering the ethical concerns of vulnerable children in healthcare settings, such as marginalization or exclusion, underscores the importance of creating ethical frameworks and resources to optimize children's participation in their care, emphasizing the need for interprofessional collaboration and tailored communication strategies [45].

**Pre-visit planning-** Pre-visit planning for ethically allocating resources in pediatric orthopedics involves utilizing professional interpreters to overcome communication barriers [46], considering distributive justice principles to balance individual patient interests with healthcare system sustainability, and incorporating ethics consultation services (ECS) to address ethical dilemmas and facilitate shared decision-making. By involving family members in decision-making, implementing triage standards of care, and conducting ongoing research, pediatric orthopedic surgeons can optimize resource management and enhance patient outcomes during emergency mass critical care events [47]. Standardizing new procedures, studying their effects, and reporting outcomes are crucial steps to ensure the reasonable introduction of innovative practices in pediatric orthopedics. By integrating these strategies into pre-visit planning, healthcare providers can promote health equity, improve communication with diverse patient populations, and navigate complex ethical considerations in resource allocation for pediatric orthopedic care.

**Promoting health equity-** Promoting health equity in pediatric orthopedic care involves recognizing and addressing disparities in access and outcomes based on factors like insurance status, race, and social deprivation [48,49]. Pediatric orthopedic surgeons play a crucial role in advocating for inclusive care for all children, regardless of their circumstances, by addressing biases and promoting inclusivity in clinical practices [50]. To achieve equitable care, it is essential to consider the unique needs of children, especially those with chronic conditions, who are at higher risk of adverse outcomes due to delays in care and system failures [51]. By reducing barriers to care, such as improving health literacy, transportation, and education among patients and parents, the goal of promoting health equity in pediatric orthopedic care can be advanced [52].

complexity to the decision-making process. Balancing bioethical principles, parental authority, and the child's best interest is essential in navigating end-of-life care dilemmas in pediatric orthopaedics (Fig. 1) [55].



**Fig. 1:** Complex decision-making processes involved in end-of-life care for pediatric orthopedic patients

**Table 2:** Strategies for Ethical Resource Allocation in Pediatric Orthopedics.

Strategies	Description
Utilizing professional interpreters	Ensuring effective communication with non-English speaking patients and their families.
Pre-visit planning	Streamlining appointments to optimize time and resources, improving patient care efficiency.
Promoting health equity	Focusing on fair resource distribution ensures all pediatric patients receive proper care.

## CONCLUSIONS

In conclusion, the review underscores the ethical complexities inherent in pediatric orthopedic care, emphasizing the importance of informed consent, shared decision-making, and ethical principles in treatment management. By navigating these ethical dilemmas with a patient-centered approach and collaborative decision-making, healthcare providers can enhance the quality of care for young orthopedic patients while upholding ethical standards. Clear communication, respect for autonomy, and a commitment to benevolence and nonmaleficence are essential in addressing ethical challenges and ensuring the well-being of pediatric orthopedic patients.

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**End-of-Life Care-** Ethical dilemmas in end-of-life care within pediatric orthopedics involve complex decision-making processes due to the unique aspects of pediatric patients. While a paternalistic approach is often applied in pediatric end-of-life care [53], considerations for the child's input and autonomy are crucial, even in cases of presumed limitations due to age [54]. Legal aspects, such as the permissibility of end-of-life decisions in minors based on their competency and authentic wish to die, play a significant role in shaping the ethical landscape of pediatric end-of-life care [55]. Additionally, the involvement of parents as legal authorities in health care decisions for children under 18 adds another layer of

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