



# Ethical Concerns of Bariatric Surgery in the Pediatric Population

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## 18.1 Introduction

Approximately 18.5% of youth in the USA meet the criteria for obesity, defined as a body mass index (BMI)  $\geq$  95th percentile for age and sex. 8.5% of those aged 12–19 are categorized as severely obese (BMI  $\geq$  120% of the 95th percentile) [1]. This concerning trend increases the risk of obesity-related morbidity and mortality over time, and children who develop obesity are at higher risk of experiencing complications from their obesity than individuals who develop obesity later in life. Moreover, adolescent obesity predicts adult obesity and its many associated metabolic complications, such as type 2 diabetes (T2D), obstructive sleep apnea, hypertension, nonalcoholic fatty liver disease, and dyslipidemia [2, 3].

Medical intervention programs such as family-based behavioral therapy coupled with caloric reduction and increases in physical activity have varied success rates, with some studies showing it to be only be effective for 50% of patients [4]. In contrast, for carefully screened adolescent candidates, metabolic and bariatric surgery (MBS) has been shown to be more effective for treating severe obesity and related co-morbidities than medical intervention. Despite evidence that bariatric surgery leads to excellent short-term outcomes, the annual number of inpatient bariatric surgery admissions for adolescents (aged  $\leq$ 20 years) remains low [5].

The reason for this is multifactorial, and despite the evidence for short-term success in bariatric surgery, many ethical and moral issues exist in performing bariatric

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surgery in the pediatric population. This chapter addresses the ethical concerns of bariatric surgery in the pediatric patient through the lens of the four major ethical principles of autonomy, beneficence, nonmaleficence, and justice. These four principles will be used to aid physicians and patients in the bioethical decision making to be considered in the pediatric bariatric surgery patient.

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## 18.2 Search Strategy

A literature search of English language publications from 2000 to 2019 was performed to identify information on ethical principles in the context of pediatric bariatric surgery. Databases searched were PubMed, Embase, Science Citation Index/Social sciences Citation Index, and Cochrane Evidence Based Medicine. Terms used in our search included (Bariatric Surgery OR Metabolic Surgery OR Bariatric Surgical Procedures OR Stomach Stapling) AND (Child OR Adolescent) AND (Ethics OR Moral Policy OR Bariatric Surgery/ethics OR ethical OR moral OR autonomy OR benevolence OR non-maleficence.)

### 18.2.1 Autonomy

Autonomy in the medical setting refers to the obligation to respect the self-determination of patients who have decision-making capacity. There are a variety of issues that are raised when considering the autonomous decision making for adolescent patients who have not yet reached the age of medical consent.

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## 18.3 Pediatric Patients Are Unable to Provide Their Own Consent

The need for informed decision making or informed consent is paramount in the context of the pediatric bariatric surgical patient. Informed consent involves the permission granted for the performance of a medical or surgical intervention with knowledge of the possible consequences of that treatment. The legal authority to provide informed consent requires the legal ability to form a valid contract and the psychological or developmental ability to make sound decisions [6]. In this context, minors cannot give legal informed consent.

The ethical concerns of informed consent in the pediatric subpopulation is not unique to MBS, and thus the American Academy of Pediatrics (AAP) recommends a two-step approach to informed consent for children: 1) The child must assent to the treatment, and 2) The physician should receive the proxy consent of the parent, also called informed parental permission. Assent, as opposed to consent, refers to the ability of the child to give affirmation to the procedure based on the extent he/she is able to understand the procedure. This understanding stems from an explanation of the procedure itself, the medical condition, a framework of *values* that

provides a context for specific value judgments, and the ability for the pediatric patient to reason through all available options and appreciate their effect, including risks and chances of success. This is necessary to demonstrate respect for the patient's emerging autonomy and may help enhance cooperation with medical care [6, 7].

Ethical questions arise concerning when adolescents and children are considered to be old enough to be legally allowed to make their own medical decisions. Minor treatment statutes, known as the mature minor doctrine, allow minors with *adequate decisional capacity and understanding* of their medical condition the right to consent to treatment without parental permission, with examples of this used in both reproductive and mental health. The age for this doctrine varies by state statute, with 16 years being a common cut-off, but with some states using an age as young as 14 years to consent to medical treatment [6].

There is no agreed consensus in the pediatric bariatric surgery literature for the minimum age of operation. In one review article, it was found that physiologic maturity was most often used to calculate minimum age for MBS. Six articles adopted Tanner stage IV and/or 95% of adult height based on bone age, which corresponds to  $\geq 13$  years old for girls and  $\geq 15$  years old for boys [5]. In contrast, one study by Woolford et al. showed that most physicians thought patients should be at least 18 years old before being considered for surgery [8], while healthcare professionals in a UK study believed 16 years to be an acceptable minimum age [9].

Ethical and moral issues also arise from the parent perspective. Some parents focus on the negative medical and psychosocial impact of obesity in their children or may feel guilt for their child's situation. These parental feelings should have no influence on a child's access to surgery [10], but parental pressures introduce a risk of overt or covert coercion in the child or adolescent's assent. More so, this may lead parents to push for their own wishes to supersede the wishes of their own children. At the same time, parental involvement is relevant in assessing a child's eligibility for surgery, as parental support is important in preadolescent and adolescent post-surgical nutritional management. Balancing the cognitive, emotional, and social development of the child, as well as the familial support available to the child is critical for determining a child's eligibility for MBS, and this balance can be a source of ethical challenges when determining a child's preparedness for MBS [10, 11].

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#### **18.4 Primary Care Providers May Not Be Willing to Recommend Bariatric Surgery Despite Their Patient's Wishes**

The autonomy of pediatric patients is also impacted by the potential biases that exist within the medical community. Some studies seem to suggest that despite the growing problem of childhood obesity and the potential difficulties encountered with sustaining weight loss using non-operative methods, many of primary care physicians are reluctant to refer adolescents for a bariatric surgical assessment [9]. In one

study, 48% participating family physicians and pediatricians indicated that they would not ever refer an obese adolescent for a bariatric operation and 46% indicated that the minimum age at which they would make a referral was 18 years [12]. In another study, although 66.8% of primary care physicians surveyed expected that MBS may be effective in therapy-resistant morbid obesity, only 41.3% would consider referral for surgery [13]. The most important reason for reluctance was the uncertainty about long-term efficacy and safety and the unknown long-term metabolic effects of weight loss surgery in such a young population [13, 14].

Another component affecting providers may be weight discrimination and stigmatization in the medical community. These stereotypes unjustly categorize overweight and obese persons as “lazy, sloppy, unmotivated, noncompliant, and less competent”, who are “willful deviants who lack self-discipline” [11]. This biased sentiment may contribute to the unwillingness of primary care providers to refer child or adolescent patients to bariatric surgery centers, despite medical indications and/or the patient’s and their parent’s desire to pursue surgical intervention.

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## **18.5 The Outcomes of These Procedures Will Be Faced by Patients Well After They Have Attained the Age of Consent**

Bariatric surgical procedures including vertical sleeve gastrectomy and Roux-en-Y gastric bypass permanently alter the anatomy and physiology of patients. An ethical concern for the pediatric patient undergoing MBS is that they may assent to the procedure at the time, but regret such an assent later in life. MBS leads to permanent changes in patients’ nutritional status, routines, medication regimens, and ability to socialize. These permanent changes may not be fully grasped or may not seem important to children and adolescents at the time of intervention, and may result in procedural regret in the future [10].

Furthermore, long term data in the pediatric population in the context of MBS has yet to be fully vetted [15]. Although there is strong evidence for improved weight reduction and reversal of comorbidities, the potential remains for the development of unforeseen problems much later in life [16]. A thorough and candid discussion about unintended consequences between the pediatric bariatric surgeon, the patient, and his/her family should emphasize what is known and, more importantly, what is unknown about late effects of MBS [17].

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## **18.6 Informed Consent for Bariatric Surgery in the Pediatric Population**

The complexity of information necessary for informed consent for MBS can be overwhelming for both adult and pediatric patients. In one study of adult MBS patients, only one-third of patients tested on information about bariatric surgery that

**Table 18.1** Principles of informed consent for adolescent bariatric patients

1. Disclosure of the patient's diagnosis, including the degree of morbid obesity and the extent of comorbidities; this should include a discussion in lay language about what is currently understood about the pathophysiology of obesity and its related complications.
2. The nature of the proposed bariatric operation(s); use of visual aids and/or videos may help in describing each procedure.
3. The risks and benefits of the proposed interventions; including explicit discussion of what each complication would mean to the individual patient (i.e., an anastomotic leak is life-threatening and requires urgent reoperation, a slipped AGB must be realigned or replaced).
4. The actions and behaviors the patient will need to continue after the procedure in order for the bariatric operation to be successful in achieving weight loss, reversal of comorbidities, and to remain healthy.
5. An outline of the medical, surgical, and other follow up that will be required in the short- and long-term aspects of postoperative care.
6. Alternatives to the proposed bariatric interventions and their risks and benefits.
7. The risks and benefits of receiving no bariatric intervention or medical treatment.
8. The financial aspects of the proposed bariatric interventions, postoperative care, and costs if complications develop in the short and long term.
9. The outcomes of pediatric bariatric operations by the pediatric surgical team, including how they compare to published outcomes for complications and durable weight loss.
10. If the patient is a candidate for a clinical research trial.

Modified from Caniano [17]

had been provided during preoperative informed consent could correctly answer all questions 1 year post-surgery [18].

Informed consent for a bariatric intervention in a pediatric patient should be a lengthy process that takes place over a several-month period, during which the adolescent and his/her family engage in a medical weight reduction and behavioral modification program. Long term interactions with the pediatric surgeon concurrently during this time reinforces information about specific bariatric options, the risk/benefit profile for each operation, the likelihood of reaching the patient's stated goals, and a frank discussion about the uncertain long-term aspects of treatment [17]. The critical aspects of informed consent for adolescents undergoing bariatric surgery is summarized in Table 18.1.

Patients should not be considered candidates for MBS if they have poorly documented weight loss attempts, inadequate family support, a lack of insight into their problem, impaired decision-making capacity, major unstable psychoses, or suicidal ideation [15].

### 18.6.1 Beneficence

Beneficence in the context of adolescent obesity refers to the obligation for physicians to seek to reverse the physical and psychological derangements that interfere with well-being of obese pediatric patients [17].

## 18.7 Medical Weight Loss Has a Very Low Success Rate as Compared to Bariatric Surgery

For the morbidly obese, a twofold increased risk of mortality has been detected as early as the fourth decade of life [15]. Structured diet and exercise programs, which are the first line therapies for obesity, have relatively poor outcomes. Pharmacologic options and meal replacements are being investigated, but data demonstrating the safety and effectiveness of many of these pharmacologic agents is poor and many do not have FDA approval in patients under the age of 18. Protein-sparing modified fasts have been demonstrated as safe and effective methods of weight loss, but only when performed in a supervised inpatient setting, causing long-term recidivism to remain an issue [19].

MBS has been shown to be an effective method to achieve weight loss and reverse obesity related complications. A systematic review and meta-analysis of adolescent MBS demonstrated an average weighted BMI difference from baseline to 1 year of  $-13.5 \text{ kg/m}^2$  when including all procedures. When analyzed by procedure type, weight loss was greatest for roux-en-y gastric bypass (RYGB) and least for adjustable gastric banding (AGB) [20]. Data from Teen-LABS, a multi-centered longitudinal study, showed that 242 adolescents who underwent MBS at one of five adolescent bariatric centers demonstrated BMI reductions of  $15.1 \text{ kg/m}^2$  (28%),  $13.1 \text{ kg/m}^2$  (28%), and  $3.8 \text{ kg/m}^2$  (8%) among adolescents undergoing RYGB, Vertical Sleeve Gastrectomy (VSG), and AGB procedures, respectively after 3 years [21].

Teen-LABS also demonstrated that by 3 years after surgical intervention, remission of type 2 diabetes occurred in 95% of patients, and remission of abnormal kidney function, pre-diabetes, hypertension, and dyslipidemia occurred in 86%, in 76%, 74%, and 66% of patients, respectively [21]. These data suggest that offering MBS as an option along the spectrum of care for adolescent patients with obesity is in keeping with the principle of beneficence.

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## 18.8 Lack of Guidelines Exist That Define a Reasonable Course of Medical Weight Loss for a Child Prior to Advancing Towards Surgical Intervention

According to Caniano, violation of beneficence in the setting of adolescent morbid obesity include situations in which there was inadequate preoperative evaluation of patient comorbidities and insufficient efforts to achieve weight reduction by medical interventions [17]. Failure of medical therapy for obesity may prompt, under the principle of beneficence, consideration for MBS. Unfortunately, there are no clear guidelines that define a reasonable course of medical weight loss prior to advancing towards surgical intervention. One study interviewing UK physicians and adolescent bariatric surgery care teams showed that 58.4% selected 12 months as an adequate time period. It was also noted that almost 40% of surgeons felt that 6 months was a sufficient period for a weight management program, as opposed to only 17% of the physicians and nurses [9].

### **18.8.1 Non-maleficence**

The principle of non-maleficence refers to the physician's obligation to avoid inflicting harm on a patient. In the context of adolescent obesity, this involves balancing the known long-term risks of obesity with the known short-term risks of obesity surgery and the somewhat nebulous long-term effects of obesity surgery.

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### **18.9 Data Regarding Long-Term Outcomes Is Lacking, Leading to Ethical Constraints When Performing Irreversible Operations**

Short term postoperative complications after MBS are well documented and include anastomotic or staple line leak, strictures, postoperative bleeding, bowel obstructions, wound infections, deep venous thrombosis, worsened gastroesophageal reflux, and hospital readmissions [16]. The most significant long-term complications of adolescent MBS are nutritional deficiencies, metabolic complications such as dumping syndrome, and psychological adjustment problems. Furthermore, additional management of excess skin may be required, which would require additional postoperative body contouring surgery [19]. The lack of mature long-term outcomes data for adolescent bariatric surgery patients presents some ethical ambiguity when considering the obligation to avoid causing harm to a patient.

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### **18.10 Our Preoperative Evaluations Center Around Perceived Ability to Maintain a Weight-Loss Diet, But Not on the Resilience of Children Who Face Operative Complications for an Elective Procedure**

The potential harms that can occur following bariatric interventions may be difficult for an adolescent patient and her/his family to manage, and complications may have more severe consequences as a result. Adverse events are reported even with very experienced surgeons [10], and a patient may not fully appreciate the impact that complications will have in terms of length of hospitalization, re-operative surgery, and unanticipated long-term problems [17].

Perhaps the best way of addressing this ethical dilemma is to prevent complications as much as possible. This includes procedures performed by only experienced providers in settings that can appropriately care for obese patients, as conditions under which bariatric surgery is performed appears to be highly relevant for the outcome. High quality care includes preoperative evaluation by a multidisciplinary team, an MBS center with competency with children and adolescents, close postoperative care and follow up, and family support [10].

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## **18.11 Mental Disorders Should Be Monitored and Addressed in the Treatment of Severe Obesity to Prevent Any Additional Harm to Adolescent Mental Health**

There is a high prevalence of mental health association in the obese pediatric population, with studies demonstrating that up to 30% of adolescents seeking weight-loss surgery self-reported symptoms of clinical depression, had significantly lower health-related quality of life scores, and up to 45% reported binge eating behaviors at some point in their life [22, 23]. Failure of expected results or the development of complications from MBS can exacerbate these psychological stressors. There is an ethical obligation for bariatric surgical centers to care for the potential psychological comorbidities associated with obesity, and this obligation may be amplified when treating adolescents. Ongoing psychosocial evaluation and support with an emphasis on optimizing mental health, social support structure, and adequately assessing whether an adolescent and their guardian fully understand the risk and benefits of MBS are very important to ensure the successful holistic care of obese adolescents [12].

### **18.11.1 Justice**

The ethical principle of justice refers to the mandate that each person receives a fair share of health resources and equitable treatment [17]. Encapsulated within this is an implicit understanding that certain disease processes are unequally distributed amongst different populations based on race, socio-economic status, and other demographic differences. A just medical system of care is capable of addressing the unique needs of different communities.

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## **18.12 Ethnic and Socio-economic Disparities in Terms of Rates of Obesity and Access to Medical and Surgical Care Exist, and Certain Populations May Be Excluded from the More Efficacious Surgical Approach**

Pediatric obesity in the US affects one in three socially disadvantaged children, and children raised in low income neighborhoods score worse on most childhood health indicators. In fact, children within the lowest 20th-percentile for socioeconomic status (SES) have a 70% increase in obesity rates when compared to the highest 5th-percentile. Black, Hispanic, and Native American children across all economic strata also have significantly higher rates of obesity. Given these disparities, it is important for surgeons and practitioners to advocate for these patients and note at risk populations may not have ready access to medical weight management and bariatric services [17].



## 18.13 Conclusions and Recommendations

The treatment of obesity includes a wide range of options, including MBS. The ethical constructs surrounding MBS must be fully developed in order to provide reasonable treatment options for adolescents that appropriately addresses a variety of issues unique to minors. The ethical principles of autonomy, beneficence, non-maleficence, and justice each raise unique issues that must be carefully considered both from a population perspective, and from the perspective of each individual patient. The ultimate decision as to which pediatric patients are appropriate candidates for MBS must take into consideration a variety of individual, familial, and social factors that impact the physical and mental outcomes associated with the surgical therapy of obesity.

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