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Current Approaches to the Management of Pediatric Overweight and Obesity

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Opinion Statement

Family-based behavioral intervention has been demonstrated to be an effective and safe treatment for childhood obesity and should be considered a first-line treatment option. However, access to such intensive evidence-based treatment is limited and, currently, obesity care is dominated by high intensity behavioral treatment implemented in specialty clinics or less effective, low intensity treatments implemented in primary care. However, capitalizing on the established and ongoing relationship between primary care providers and families, primary care providers hold an invaluable role in early identification of overweight and obesity, and subsequent referral to an evidence-based treatment. key aspects of effective treatment include: early intervention, moderate- to high-intensity intervention of sufficient duration, multi-component intervention targeting dietary modification, physical activity and behavioral strategies, family involvement and goals targeting family members, and follow-up contact during maintenance. The purpose of this review is to present the current empirically supported treatment options for pediatric obesity including primary care-based interventions and diagnostic tools, multi-component behavioral intervention with a focus on family-based behavioral intervention, immersion treatment, and pharmacologic and surgical management.

Keywords

childhood obesity; primary care; behavioral intervention; bariatric surgery; prevention

Introduction

The prevalence of childhood overweight and obesity has tripled in the past 30 years in the United States. Recent estimates from 2011–2012, indicate that approximately 31.8% of youth ages 2 to 19 were either overweight or obese, and 16.9% of those youth were obese [1]. While childhood overweight and obesity have begun to stabilize, the most recent NHANES data show that class 2 obesity (> 120% of 95th percentile) has risen from 3.8% in 1999–2000 to 5.9% in 2011–2012 and class 3 obesity (> 140% of 95th percentile) has

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increased from 0.9% to 2.1% in this same time span [2]. The rise in childhood obesity has lead to increased rates of type II diabetes, fatty liver disease, and orthopedic problems that have traditionally been seen only in adults [2–4]. Furthermore, obesity in childhood is associated with a host of risk factors for cardiovascular disease (CVD), such as hypertension, dyslipidemia, and atherosclerosis, as well as coronary artery disease and premature mortality in adulthood [5–7]. The rise of severe obesity is especially concerning given that the risk of these conditions is directly related to BMI [8].

As a result, the economic and health care costs associated with childhood obesity are staggering [8–10]. From 1979–1981, annual hospital costs associated with primary or secondary diagnoses of obesity were about $35 million (0.43% of total hospital costs) and than tripled to $127 million by 1999 (1.70% of total hospital costs) [11]. Current data estimates lifetime direct medical costs related to obesity to range from $12,660 to $19,630 when adjusting for weight gain through adulthood among normal weight and from $16,310 to $39,080 without adjustment [12].

Childhood overweight and obesity are also significant risk factors for overweight and obesity in adulthood and risk increases with the severity of obesity and the age of the child [13–16]. Among children who are obese, 82% become obese adults [17]. Even in infancy, weight status can track over time. Infants at the highest quartiles of weight-for-length have an obesity prevalence of 40% at age 3 versus 1% for those infants at the lowest quartiles of weight-for-length [18]. Furthermore, overweight 5 year-olds are four times more likely than normal weight children to become obese by age 14 [19]. However, resolution of weight problems in childhood can help prevent health complications in adulthood. A 23-year longitudinal study found that children with obesity who had achieved a healthy weight by adulthood had a similar CVD risk to those who were non-obese as both children and adults [17]. To this end, use of evidence-based treatment is critical for intervention as most children do not grow out of overweight or obesity.

Fortunately, when obesity is treated at an early age, relatively small weight losses can bring even a severely obese child to a healthy weight [20*]. Goldschmidt and colleagues found that due to the potential for height growth, children ages 8–9 years old above the 97th percentile needed to lose only 1.8 (girls) to 2.1 kg (boys) over one year to achieve a healthy weight. Even maintaining weight and preventing weight gain in growing children improves cardiovascular risk factors [21]. However, intervening as early as possible in childhood is necessary to yield these positive outcomes; Danielsson and colleagues demonstrated that while behavioral intervention produced clinical significant reduction in BMI z-scores in 58% of severely obese young children, the same intervention had almost no effect on severely obese adolescents [22*]. Early childhood intervention also allows healthy eating and physical activity habits to be established before children become entrenched in obesogenic patterns [23]. Thus, prevention and early intervention are critical to promote a healthy weight and cardiovascular health in adulthood.

Diagnosis and Measurement

Because children undergo height changes and expected weight to height ratios change non-linearly as they age, standard BMI measurements (kg/m^2) are inadequate [24]. BMI percentile is one common unit based on population growth curves developed by the Centers for Disease Control (CDC). Within this measurement, children above the 85^{th} and below the 95^{th} percentile are considered overweight, and children at or above the 95^{th} are considered obese. Another common unit is BMI z-score (zBMI), which represents the number of standard deviation units above or below the median when considering both age and sex.

While both BMI percentile and zBMI are effective measurement tools for diagnosis, they are not ideal for characterizing weight change in an obese population [25]. While these measures are sensitive to change in normal weight children, they are less sensitive at the extremes given reductions in variability at the upper end of the weight distribution [24]. A relatively new measure, "percentage over the 95^{th} percentile", seeks to ameliorate these challenges by providing a metric for categorizing severely obese children and characterizing weight changes in this population more accurately [25]. For instance, a severely obese child at the 99^{th} percentile who experiences a significant weight change may remain "stable" at the 99^{th} percentile, but would move several percentage points utilizing the metric of percentage over the 95^{th} percentile. However, this metric remains to be sufficiently tested in research and clinical settings [26]. Percent overweight (%OW), also referred to as percent over BMI, calculated as 100 * (BMI/50^{th} percentile BMI for child age and gender), can be similarly helpful for providing evidence of weight change in severely obese children [24]. Controversy surrounds which measurement unit is most accurate and currently each of these measures is used in research; therefore, the following discussion will not be limited to one outcome measure.

In adult samples, a 5–10% reduction in body weight is generally considered effective to reduce health concerns associated with obesity [27], but less is known regarding clinically significant weight loss in children. Research suggests that a reduction in zBMI of ≥0.25 is clinically meaningful and can improve cardiovascular risk factors in children and adolescents [28, 29]. A summary of these diagnostic tools is presented in Table 1. Each of these measures can be effectively used to provide patients with accurate feedback regarding child weight status.

Primary Care Based Intervention

Family physicians and pediatricians have the opportunity for early identification of overweight and obesity through routine physical examinations [30]. However, at present, the evidence suggests that primary care-based treatment without interventionist support is not sufficient to manage pediatric obesity [31]. Providers are often limited to a single visit to address the problem, but even a study involving four physician consultations regarding dietary and physical activity behaviors over 12 months did not produce sustained BMI reduction relative to control [32]. Primary care based interventions may be more effective if implemented at a higher intensity by a trained interventionist. Adolescent females participating in weekly group sessions for three months followed by bi-weekly sessions for

two months decreased modestly, but significantly, in zBMI units compared to usual care control group [33]. Another intensive study completed in primary care that focused on diet and physical activity behavior change in both preschoolers and parents demonstrated greater weight loss compared to control [34]. Thus any treatment delivered in primary care must be high intensity to be effective and consistent screening for overweight and obesity and referral to evidence-based care offered within or outside the clinic may be an optimal role of the primary care provider [30].

Family Based Lifestyle Intervention

Lifestyle interventions are defined as active treatments that focus on modifying children's daily dietary and activity behaviors, targeting sustainable changes associated with healthy weight management [35, 36]. The efficacy of behavioral interventions is dependent on several factors; the most successful take a multi-dimensional approach targeting diet, physical activity and behavior modification, are family-based, targeting both parent and child behaviors, are of sufficient duration, and focus on behaviors across socio-environmental contexts [37]. Randomized controlled trials and meta-analyses have consistently demonstrated the superiority of these multi-component behavioral interventions over education only or usual care conditions for treating childhood overweight and obesity, with family-based treatments demonstrating the largest effects [38–41]. As a result, the US Preventive Services Task Force recommends that pediatricians and primary care physicians screen for obesity in all children over 6 years old, and refer children over six years old presenting with overweight and obesity to intensive lifestyle interventions and counseling that targets diet, physical activity and behavior change [42]. Beyond this population, family-based treatment has also demonstrated efficacy in toddlers ages 2–6 years old [34]. Treatment should be moderate to high intensity, or 26–75 hours of contact [42, 43].

A recent meta-analysis of behavioral interventions demonstrated significant improvements in BMI, as well as many CVD risk factors including, HDL and LDL cholesterol, triglycerides, fasting glucose, and fasting insulin, following treatment [44*]. Similarly, a recent study examined changes in metabolic parameters and glycemic control in 115 children ages 7–18, above the 90th BMI percentile over a one-year multi-component lifestyle intervention [45]. Children given the intervention demonstrated significant improvements in all anthropometric measures, as well as mean glucose and HbA1c. These results mirror earlier findings from a 6 month family-based intervention demonstrating decreases in BMI, fat mass, total cholesterol and insulin resistance, with results persisting at a 12 month follow-up [46]. These data demonstrate overwhelming evidence of the efficacy of multi-component behavioral interventions for improving cardiovascular risk factors in overweight and obese children.

Diet and Physical Activity Targets

Following AHA guidelines for children over two years of age, dietary modification should emphasize increased consumption of fruits and vegetables, whole grains, low-fat and non-fat dairy products, beans, fish and lean meats [47]. Treatment should focus on reducing high-fat and high calorie foods, and reducing or eliminating sugar sweetened beverages such as soft-drinks and fruit drinks [48]. In addition, mild caloric restriction is both safe and effective

[49]; however severe caloric restriction practices such as very low calorie diets (500–800 kcal/day) or high protein diets are not recommended as these methods can induce vitamin and mineral deficiencies and disrupt natural growth, bone accretion, and menstrual cycles.

The Traffic Light Plan is one method of attaining a caloric deficit by decreasing high energy density foods (high calorie, low volume) and increasing low energy density foods (low calorie, high volume) [31]. This program classifies foods as green (low energy density, encouraged to increase consumption), yellow (moderate energy density, eat in moderation), and red (high energy density, stop and think before eating). These categories are designed to help children gradually decrease their fat and calorie intake, while adopting healthier eating patterns.

Treatment should target gradually increasing the child's physical activity to at least 60 minutes/day on all or most days of the week, in line with CDC recommendations [30, 50]. Physical activity should be developmentally appropriate, and especially at younger ages, should be focused on intermittent, unstructured play rather than structured cardiovascular exercise. The goal of physical activity should not just be caloric expenditure, but also fostering an enjoyment of physical activity, motor skill improvement, and increased self-efficacy for physical activity [51]. These targets are necessary to form sustainable physical activity habits.

Parental Involvement

Family-based behavioral treatment (FBT), a multi-component lifestyle intervention that targets the behaviors of both the child and the parent [37], has consistently proven to be the most robust intervention for pediatric obesity [52, 53]. Studies examining FBT have demonstrated both a large effect size [54] and long-term maintenance of weight loss [55] with children decreasing percent overweight by 20%, and effects still significant at 10 years post-treatment. Inclusion of parents as targets is critical as parent success is directly correlated with child success [34, 56, 57]. Additionally, harnessing ongoing parental support enables children to maintain new healthy behaviors long-term, and has been shown to produce larger results than interventions that do not involve parents [39].

The goal of FBT is to foster family support for new healthy behaviors and to create a home environment that promotes healthy eating and activity. The eating and exercise behaviors of children occur primarily in the context of the home environment [58] and the strongest predictors of overweight and obesity are those associated with parents and the home [59]. Therefore, FBT aims to modify eating and activity behaviors of both the child and parent with successive changes to the home environment, utilizing the parents as agents of change. Treatment is focused on building skills in self-monitoring, parental praise and positive reinforcement, stimulus control, and problem solving, along with parenting skills such as limit setting [37]. Table 2 presents results from meta-analyses of FBT alongside results from other treatment options [37, 39, 40, 43, 60].

Treatment Duration

In order to achieve optimal results, FBT must be delivered with medium to high intensity (26–75 hours of contact)[42, 43], with sufficient duration (6 months for initial weight loss

phase), and have a strong family component. Demonstrating differential efficacy due to these variables, a meta-analysis of 16 studies and 44 treatment groups found a significantly greater effect size for lifestyle interventions that included a family based component, compared with alternative treatments that did not target the family [60]. There was a 6% greater mean reduction in % overweight in family-based interventions vs. other interventions in the meta-analysis. Further exploration revealed that one family-based intervention study conducted by Epstein and colleagues had a significantly greater effect size than the remaining treatments [61]. This treatment was significantly longer in duration than the majority of the other studies included (6 months vs. 8 weeks) and had a more comprehensive approach to family involvement. Epstein's study randomized children to a child-only, child and parent, or non-specific control group [55]. While weight changes were not significantly different between groups immediately following treatment, the combined parent and child group %OW decreased by 11.2 points at 5 years (compared to +7.9 points control) and by 7.5 points at 10 years (compared to +14.3 points control). The child-only group was not significantly different than the control or parent and child group. These data suggest that adding a family-based component to lifestyle intervention can significantly enhance the effectiveness of the treatment, especially when the intervention is of long enough duration and both child and parent weight and behaviors are targeted. These treatments have demonstrated efficacy from preschool children [34] to pre-adolescents [62].

Socioenvironmental Contexts

While many behavioral treatments can produce clinically meaningful results in the short term, maintenance requires a comprehensive approach that spans socioenvironmental contexts. Thus, Wilfley and colleagues developed a social facilitation maintenance treatment (SFM) to build on strategies learned in FBT and expand the reach of behavior changes across social contexts to enhance parent and peer support, improve body image, and help children respond to teasing, ultimately promoting healthy eating and activity behaviors beyond treatment cessation [63]. Following FBT with SFM improved maintenance during the extended treatment, though children regained some weight following treatment cessation [38]. To address this weight regain, SFM treatment was enhanced (SFM+) [63]. SFM+ aims to strengthen support systems and behavioral responses in multiple contexts (individual, home, peer and community) in order to decrease the potential for relapse [63]. Basic behavioral research has demonstrated that previously learned behaviors are not replaced by newly learned behaviors, but rather coexist with them [64, 65]. These newly learned behaviors are also less generalizable, and old learning is susceptible to contextual cues for activation. Thus, using a socio-environmental approach, SFM+ targets learning and practicing new behaviors across multiple contexts to firmly establish new healthy habits. Biosimulation projections are positive for the potential efficacy of SFM+ [63], and the treatment is currently under investigation in a multi-site randomized controlled trial.

In summary, FBT should be considered as the primary treatment option due to the magnitude of effects achieved, the sustainability of the results, the effect on cardiovascular disease risk, and the safety of treatment relative to more invasive options.

Immersion

As initial and consistent success is a robust predictor of overall treatment success, immersion treatment has been developed as an intensive therapy that moves a child from the obesogenic environment into a therapeutic environment that ensures healthy weight loss behaviors [66]. With a structure similar to summer camp, these programs ensure a restricted diet, at least 6 days/week of physical activity, and the most effective programs are those that include a cognitive behavioral therapy component [67]. A meta-analysis of 22 immersion treatments demonstrated an average reduction in percent overweight of 23.9% post treatment and 20.6% at follow-up [67]. While such treatments can achieve dramatic results, they are costly (~ $1,000/week) [66] and should thus be reserved for more severe cases of obesity [68].

Medical and Pharmacological Treatment

Despite the effectiveness of behavioral family-based interventions for pediatric obesity, medical and pharmacological treatments have gained some attention, particularly for children with severe obesity (BMI ≥ 99th percentile or BMI 120% of the ≥ 95th percentile) [69]. While severely obese young children can benefit from behavioral lifestyle interventions, severely obese older children and adolescents often require intensive intervention in order to achieve clinically significant weight loss [39, 70]. Bariatric surgery is a medical intervention utilized for adults with obesity and is associated with reductions in BMI and medical comorbidities [71]; however, given the drastic anatomical modifications to the gastrointestinal system and the potential for medical complications, surgical interventions have been utilized and studied more judiciously among youth.

While weight loss surgery is generally considered safe [72, 73], experts recommend that adolescents should only be considered for bariatric surgery if they are very severely obese (BMI ≥ 40), are at least 13 years old for girls and 15 years old for boys in order to ensure maximum skeletal maturity, have serious medical comorbidities associated with their obesity, and have failed at least 6 months of a structured weight loss program [72–74]. A variety of types of bariatric surgery have been examined among youth as young as age 10, but more frequently among adolescents, including the roux en Y gastric bypass (RYGB), adjustable gastric banding (AGB), and the vertical sleeve gastrectomy (VSG). The RYGB is the most commonly performed bariatric procedure among adolescents with the AGB growing in popularity representing approximately 67.7% and 32.1% respectively of the 1009 documented inpatient bariatric procedures among youth in 2009 [73]. Adolescents undergoing RYGB, considered to be the gold standard, demonstrate a significant reduction in BMI and a significant decrease in medical comorbidities associated with obesity, including type 2 diabetes, and metabolic markers, including fasting glucose and triglycerides, 6–12 months post-surgery *[75–78]. It is recommended that adolescents undergoing bariatric surgery receive regular follow-ups in order to monitor complications and long-term outcomes given the current dearth of research demonstrating sustained safety and efficacy. Additionally, very little is known about bariatric surgery in pre-pubescent children who have not yet achieved mature height, thus, recommendations for surgical intervention for children is not yet warranted.

Pharmacotherapy has also received attention as a supplement to lifestyle interventions, and a secondary step prior to considering bariatric surgery, for the treatment of pediatric obesity. At present, Orlistat is the only weight loss medication approved by the FDA for use in adolescents. Clinical trials have produced mixed results and gastrointestinal side-effects are common [79–85]. Sibutramine (not FDA approved for adolescents) is another well-studied medication that has demonstrated promising results [86, 87], but side effects are common [39]. Some current guidelines include medication as one treatment option to consider for adolescents, but not for children [48, 88].

Access to Care

While FBT has proven to be effective for treatment of childhood obesity, access to appropriate care remains a challenge. Barriers include time and cost of training providers in FBT delivery, lack of reimbursement for treatment, and limited specialty clinics to which providers can refer their patients [89]. As recent healthcare reform calls for insurance coverage of USPSTF recommendations with grade A or B recommendations, FBT should be reimbursed [90]. To achieve the broadest reach, various professionals must be equipped to deliver FBT across multiple settings. One proposed approach to address this gap is creating regional centers of excellence in which FBT experts train center leaders to deliver FBT and supervise delivery [91]. Such centers would have the potential to bridge the gap between treatment experts and interventionists to ensure proper delivery of FBT on a large scale.

Special Considerations

Given the diverse treatment options for pediatric obesity, experts recommend that the treatment selected be tailored to the needs of the individual. A stepped care approach is endorsed by several expert committees, which involves referring children to increasingly higher levels of care (e.g., self-help, outpatient cognitive behavioral therapy, immersion therapy, bariatric surgery) based on the severity of their obesity and their response to treatment [68]. At present, this model is theoretical and no data exist to determine its efficacy in pediatric samples [68]. However, stepped care has demonstrated smaller mean weight loss but greater cost effectiveness than a standard behavioral weight loss treatment in trials with adults [92].

In addition to severity of obesity, psychological and medical factors should be considered in treatment. Rates of disordered eating including binge eating disorder and loss of control are high among obese youth [93] and are associated with obesity risk [94] and poor response to weight loss treatment [95, 96]. Impulsivity and depression are also common among overweight and obese youth [97–100] and should be targeted in treatment [101–103]. Consultation with the treating pediatrician or psychiatrist in these cases is warranted.

Individualized Prevention

Preventing excess weight gain from an early age is perhaps the most reliable path to healthy weight, as treatment can be challenging regardless of the approach. Prevention efforts involve targeting behaviors that have been associated with increased weight in children and adolescents, with a particular focus on high-risk pediatric populations. Recommendations

regarding dietary intake, physical activity, and eating behaviors are general components of a healthy lifestyle and are similar to the behavioral changes that are often incorporated into treatment interventions.

Primary care settings are underutilized for preventative screening and tracking of child weight. Training efforts are currently underway to prepare physicians to adequately diagnose children at-risk for obesity and to counsel families on how best to address this issue in order to avoid incidence of child overweight and obesity [104, 105].

Early intervention, as early as the fetal stage, may be particularly important for prevention. Increased maternal weight pre-pregnancy and gestational weight gain have been associated with neonatal adiposity and are a risk factor for pediatric obesity [106, 107]. Therefore, interventions targeting parent weight may be an effective prevention method. Additionally, breast fed infants demonstrate moderately lower odds of developing overweight as children, suggesting that breastfeeding could be a preventative measure [108]. To date, studies assessing inclusion of parents in prevention initiatives have received less attention in the literature than in treatment interventions; however, initial findings are promising for positive effects on weight and healthy behaviors [109, 110].

Conclusion

Based on the evidence for the available treatments for pediatric obesity, we recommend the following: 1) Family physicians and pediatricians should routinely screen for overweight and obesity as well as risk factors for obesity, using calculated BMI and the CDC growth charts for assessments. 2) Identification and treatment should occur as early as possible in childhood for optimal results. 3) Children identified as having overweight or obesity should be referred to a multi-component family-based behavioral intervention of moderate to high intensity for comprehensive treatment. Immersion therapy, preferably with parental involvement, is the most intense of these treatment options. 4) Behavioral treatment should be followed by a maintenance program spanning socioenvironmental contexts for sustained results. 5) For cases of severe obesity in which behavioral intervention has failed, medications or bariatric surgery may be considered for adolescents; however, ongoing trials are necessary to determine the long term safety and efficacy profile for these interventions, particularly in children. 6) Prevention of pediatric obesity should include interventions targeting pre-pregnancy and gestational weight, breastfeeding, and healthy lifestyle changes in the home during early childhood.

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*denotes importance

**denotes high importance

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- Overweight and obese children aged 8–13 years participating in a family-based behavioral weight control treatment were shown to require relatively small weight changes, or slowing of weight gain, over one year in order to achieve nonoverweigh status
- Younger children with less severe overweight or obesity in many cases need only to maintain their weight or even slow weight gain to achieve normal weight status over a year
- Demonstrates the importance of early intervention and the potential value of small changes

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- A 3-year longitudinal study examining the impact of degree of obesity and age on the efficacy of a behavioral weight loss treatment
- Most importantly, while treatment produced clinically significant weight loss in a large percentage of the youngest severely obese children, severely obese adolescents were much less successful, highlighting the importance of early intervention

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- A systematic review and meta-analysis comparing the effects of diet- or exercise-only interventions with those targeting both diet and exercise among overweight children
- All interventions resulted in weight loss and metabolic improvements, and adding exercise to a dietary intervention resulted in more improvements in HDL and fasting insulin and glucose, highlighting efficacy of behavioral intervention for the treatment of pediatric obesity

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- A multi-site observational study of severely obese adolescents aged 19 and younger undergoing laparoscopic Roux-en-Y gastric bypass, vertical sleeve gastrectomy, and adjustable gastric banding
- A favorable short-term safety profile was observed, with only 8% of patients experiencing major complications within 30 days after surgery
- Further longitudinal analyses will reveal long-term safety and efficacy data and will help determine whether recommendations for bariatric surgery are warranted in this population

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Table 1

Diagnosis and measurement of pediatric obesity

Measure	Development	Interpretation	Considerations
BMI percentile	Based on growth curves developed by the CDC	<85%= normal weight 85% – 95% = overweight >95% = obese	Not sensitive to change in weight at the extremes
zBMI	Based on median BMI	The number of standard deviations above or below the median	
Percentage over the 95th percentile	Derived from growth curves developed by the CDC	The percentage over the 95th percentile	Characterizes changes in severely obese children more accurately
Percent overweight (Percent over BMI)	Based on the 50th percentile BMI	The percentage over the 50th percentile	

Table 2

Summary of pediatric obesity interventions

Intervention	Definitions/Key Features	Pros	Cons
Primary Care- Based	• Behavioral lifestyle or educational intervention delivered in context of primary care	• Multiple time points to initiate intervention • Support for medical comorbidities	• Lack of physician training in child behavioral weight loss • Low intensity is insufficient
Family-Based	• Behavioral lifestyle intervention • Parents as agents of change • Specific diet and physical activity guidelines	• Improved weight loss maintenance • Harnesses family support • Targets behaviors across multiple contexts	• Time-intensive • Costly • Less effective for severely obese children
Immersion	• Behavioral lifestyle intervention delivered in camp context away from home	• High intensity • Direct control over nutrition and physical activity • Obesogenic environment is removed	• Costly • Resource-intensive • Obesogenic environment may return when child returns home
Surgical	• Roux en Y • Vertical sleeve gastrectomy • Adjustable gastric banding	• Effective for treatment of severe obesity • Positive short-term safety profile	• Possible dangerous medical complications • Permanent physical change with unknown long-term side effects • Only recommended for adolescents
Pharmacological	• Orlistat and Sibutramine most well-studied	• Promising results compared to placebo • Cost-saving with regard to time and training	• Side effects are common • Likely not more efficacious than lifestyle interventions • Only Orlistat FDA approved