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Adolescent Bariatric Surgery Programs: Progress in Pennsylvania

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ABSTRACT

OBJECTIVE: In 2019 the American Academy of Pediatrics (AAP) called for increased access to Metabolic and Bariatric Surgery (MBS). To understand adolescent weight loss programs offering MBS in Pennsylvania, a survey was completed.

METHODS: Adolescent weight loss centers in Pennsylvania offering MBS were identified using the American Society for Metabolic and Bariatric Surgery (ASMBS) on-line directory and Google search. Phone interviews were conducted with the director of each program.

RESULTS: Eight programs were identified. Operations were performed in seven adult hospitals. Six had Comprehensive Adolescent Accreditation through the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP). A total of 92 adolescents were operated on in the year from June 2021 to July 2022 which is an 84% increase from the preceding year. Ninety patients received a sleeve gastrectomy. Adult bariatric surgeons were involved in all operations. Six of the programs were led by diplomates of the American Board of Obesity Medicine. Each clinic had a psychologist. No program had all eight of the health care professionals recommended by the authors, but two programs had seven of the eight. In addition, three included a social worker, two an exercise physiologist and two had pediatric subspecialists incorporated into the clinic. Two programs had the operating surgeon caring for patients in the multidisciplinary clinic.

CONCLUSION: This survey of programs across Pennsylvania shows an increase in the number of bariatric operations. More progress is necessary to improve access to this service and improve the quality of programs in Pennsylvania.

KEYWORDS: Metabolic, Obesity, Weight Loss

What is Known:

- In the United States, 1 in 5 children meet criteria for obesity
- The obesity epidemic continues to worsen
- Metabolic and Bariatric Surgery (MBS) has been shown to be a safe and effective therapy to treat severe obesity in adolescents

What is New:

- In 2019, the American Academy of Pediatrics called for increased access to MBS for adolescents

INTRODUCTION

One in every five children in the United States meets the criteria for obesity, and the obesity epidemic is likely to continue to worsen in the coming years.^{1,2} The increasing prevalence of childhood obesity has resulted in obesity-related comorbidities occurring at a much younger age. Type II diabetes (T2DM), dyslipidemia, obstructive sleep apnea (OSA), hypertension, non-alcoholic fatty liver disease, and other obesity-related diseases have traditionally been seen as diseases that only affect adults but now affect the pediatric population.³

The initial steps in combating obesity during childhood involve behavioral health and lifestyle adjustments for the child and family. The mainstay of these approaches involves increasing energy expenditure through exercise while reducing caloric intake. If the intervention is made early enough, weight gain may slow as the child grows; therefore, the severity of obesity can decrease over time. Lifestyle management results in only about a 2.5% total body weight loss and is often associated with recidivism. In those who do not sustain weight loss with lifestyle management the use of pharmaceutical agents is commonly used and can be associated with a 10% total body weight loss.³ Compared to lifestyle and medical management of obesity, metabolic and bariatric surgery (MBS) results in a 30 to 40% total body weight loss depending on

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Table 1. Interview Questions

Category of MBSAQIP accreditation - Comprehensive Center, Adolescent Qualifications, Obesity Medicine Qualifications
Services offered in the clinic - registered dietician, pediatrician, family medicine physician, bariatric surgeon, physician's assistant, nurse practitioner, social worker, psychologist, gastroenterologist, endocrinologist, cardiologist, nephrologist, exercise physiologist, physical therapist
Youngest age considered for MBS
Oldest age considered for participation in adolescent program
Type of weight loss surgery performed on adolescents
Number of operations performed on adolescents per year
Who performed the operations - adult bariatric surgeon, pediatric surgeon, or both working together?
Is the Pediatric Medical Advisor certified by the American Board of Obesity Medicine?

Note: MBSAQIP = Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program;
MBS=Metabolic and Bariatric Surgery.

which operation is performed and , is more likely to be sustained long term.⁴ Given the accumulation of data supporting MBS in adolescents, the American Academy of Pediatrics (AAP) released a policy statement in December 2019 calling for increased access to MBS for adolescents suffering with severe obesity.⁵ The information becomes even more critical with the January 2023 AAP clinical practice guidelines for the treatment of severe obesity in children and adolescents which recommended referral for evaluation of MBS in adolescents 13 years and older with a BMI at or above 120% of the 95th percentile for their given age and sex.⁶ Despite this, Mustafa et al found the amount of weight loss surgery being performed in adolescents has not increased significantly.⁷ To assess the progress in Pennsylvania responding to this challenge, a survey was completed to evaluate the pediatric and adolescent weight management programs offering MBS as a therapeutic option for adolescents with severe obesity.

METHODS

Adolescent weight loss centers in Pennsylvania were identified using the online directory search of the American Society for Metabolic and Bariatric Surgery (ASMBS). Surgeons listing the provision of pediatric bariatric surgery (patients under the age of 18) were mapped to their MBS program through a Google search. All identified programs were contacted. Phone interviews were conducted with the program director at each location in February 2022 and confirmed with each program by email in June 2022. Only patients who participated in one of the

eight centers were included in this study. The information requested for each interview was the same (*Table 1*). None of the authors report any conflicts of interest and there was no funding secured for this project. All relevant data are within the paper.

RESULTS

A total of 11 programs were identified in our search, which stated that they offered MBS for adolescents. We conducted phone interviews with ten of these programs. One location did not return our repeated attempts to contact them. In these phone interviews we found that two of these ten programs did not offer weight loss services to adolescents despite a statement to that effect in the ASMBS directory or their website. Therefore, we identified eight programs using seven hospitals that offer weight loss services, including MBS, for adolescents across Pennsylvania. Geographically, the eight programs were distributed throughout the state, with the highest concentration (50%) located in the southeastern portion of Pennsylvania.

Prior to the AAP position statement in 2019,⁵ there were only five locations in Pennsylvania and fewer than 50 MBS operations performed per year. With the addition of three new programs in the greater Philadelphia area since 2019, there have been eight adolescent multidisciplinary weight loss centers that provided a total of 92 adolescent bariatric operations in the June 2021 to July 2022 calendar years for an 84% increase. Four programs reported ≥ 15 annual operations, accounting for 88% of all the MBS op-

Table 2. Program Characteristics

Program	1	2	3	4	5	6	7	8
Surgery at Adult or Children's Hospital	Adult	Adult	Adult	Adult	Adult	Adult	Adult	Adult
Adolescent Program Started Before or After 2019 AAP Statement	After	After	Before	Before	After	Before	Before	Before
MBSAQIP Accreditation	Adult, Adolescent	Adult, Adolescent, Obesity Medicine	Adult, Adolescent	Adult, Adolescent	Adult	Adult, Adolescent	Adult, Adolescent	Adult, Adolescent
Adult or Pediatric Surgeon	Adult	Adult	Both	Adult	Both	Adult	Adult	Adult
Surgeon Provides Pre & Postop Care in Multidisciplinary Clinic	Yes	Yes	No	No	No	No	No	No
Age Range	15-21	15-18	14-18	14-21	16-18	15-18	16-18	16-18
Average Annual Procedure Volume	25	21	20	2	2	5	2	15

Note: AAP= American Academy of Pediatrics; MBSAQIP = Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program; Adult = MBSAQIP Accreditation as Comprehensive Center; Adolescent = MBSAQIP Accreditation as Comprehensive Center with Adolescent Qualifications; Obesity Medicine = MBSAQIP Accreditation as Comprehensive Center with Adolescent and Obesity Medicine Qualifications.

erations performed on adolescents in Pennsylvania. Half of the interviewed programs performed five or fewer operations in a single calendar year. Although all programs cared for adolescents aged 18 years and younger, two programs cared for adolescents aged 21 years or younger.

Reading Hospital performed the largest number of adolescent bariatric operations. Two of the newest and largest multidisciplinary pediatric weight management programs in the Commonwealth of Pennsylvania, St. Christopher’s Hospital for Children and the Weight Loss Surgery and Wellness Center in Wyomissing, PA refer adolescents meeting criteria for bariatric surgery to this location.

Hospitals and Surgeons

All operations in our survey were performed in adult hospitals, with no operations performed in a pediatric hospital. Seven of the eight programs surveyed performed MBS in hospitals accredited for comprehensive adult and adolescent surgery. One hospital underwent additional verification of obesity medicine.

Adult bariatric surgeons were involved in all MBS operations. Two programs included a pediatric surgeon along with an adult Bariatric Surgeon.

Multidisciplinary Team Members

MBSAQIP accreditation, as a Comprehensive Center with Adolescent Qualifications, requires a Pediatric Medical Advisor, a behavioral health professional with adolescent qualifications, and a surgeon accredited by MBSAQIP⁸. In six of the eight programs, the Pediatric Medical Advisor is a diplomat of the American Board of Obesity Medicine. In addition to these three requirements, we noted the frequent inclusion of the following four additional health care professionals: social workers, exercise physiologists, pediatric dietitians, and advanced practice providers. A psychologist with qualifications in adolescent care was part of the multidisciplinary clinic in five locations (62%), and only three programs incorporated a social worker incorporated into the multidisciplinary clinic.

No program in Pennsylvania included all seven of these health care providers. However, three programs had five or more professionals integrated within their programs.

Only three programs integrated preoperative and postoperative MBS care by the operating surgeon in the same office space as a multidisciplinary program. Others referred the patient to a surgeon in a separate clinic or office.

Table 3. Services offered within the clinic of each adolescent weight loss program.

Program	1	2	3	4	5	6	7	8	% Within each clinic
Registered Dietician	Yes	Yes	Yes	Yes	Yes	Yes	Other	Yes	87.5
Pediatrician	Yes	Yes	Yes	Other	Yes	Yes	Other	Yes	75
Provider a Diplomate of the American Board of Obesity Medicine?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	87.5
Bariatric Surgeon	Yes	Yes	Other	Other	Other	Other	Other	Other	25
Advanced Practice Provider	Yes	No	No	Yes	No	Yes	Yes	Yes	62.5
Social Worker	Yes	No	Yes	Other	Yes	Other	No	No	37.5
Psychologist	Yes	Yes	Yes	Yes	No	Other	Yes	No	62.5
Gastroenterologist	Yes	No	No	Other	No	Other	No	No	12.5
Endocrinologist	No	No	Yes	Other	No	Other	No	No	12.5
Exercise Physiologist	No	No	Yes	Other	Yes	No	No	No	25

Note: Other = The service is offered outside the clinic through referrals.

Two programs incorporated pediatric subspecialists into the multidisciplinary clinic, one program included a pediatric gastroenterologist and sleep medicine specialist, and the other included a pediatric endocrinologist. In those programs that did not incorporate a pediatric subspecialist in the multidisciplinary clinic the pediatrician referred patients outside the clinic for these services as necessary.

Information regarding the characteristics of each program is presented in Table 2. Members of the multidisciplinary care team are shown in Table 3. No program incorporated the services of a cardiologist, nephrologist, or physical therapist within their clinic.

DISCUSSION

Childhood obesity is a serious medical problem affecting approximately 14.4 million American children aged 2-19 years.⁹ Unfortunately, the disease of obesity disproportionately affects African American and Hispanic children.² It is estimated that 4% to 7% of US children suffer from severe obesity, which continues to increase at a staggering rate.¹⁰

Children with severe obesity carry a heavy burden of obesity-related medical diagnoses, including type 2 diabetes, hypertension, dyslipidemia, obstructive sleep apnea and non-alcoholic fatty liver disease.¹¹ In fact, from 2009 to 2017, there was a 95.3% in-

crease in type 2 diabetes in adolescents.¹²

Unfortunately, approximately 80% of children with severe obesity become adults with obesity,¹³ which results in an increase in coronary artery disease and premature death.^{14,15}

Fortunately, if obesity is treated promptly in pediatric patients such that obesity does not extend into adulthood, the associated cardiovascular risks decrease to a level that is the same as if they never suffered from obesity as children.¹⁴

Therefore, MBS is safe for adolescents. In an overview of Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) 2015 data, no difference was found in the 30 days perioperative complications between the adults and adolescents (6.3% in adolescents, 7.3% in adults).¹⁶ Furthermore, Alqahtani et al. studied the use of laparoscopic sleeve gastrectomy (LSG) in those under 14 years of age and found that vertical growth is not adversely affected by these procedures.¹⁷

Compared to lifestyle and medical management of obesity, metabolic and bariatric surgery (MBS) provides a more rapid weight loss that is sustainable long-term.¹⁸

In several studies MBS has been shown to be an effective treatment for adolescents suffering from severe obesity and related disorders.^{19,20,21} For ex-

ample, the Teen-labs study followed 242 adolescents with an average age of 17.1 years and a BMI of 53 kg/m² for 3 years. The average total body weight loss after a Roux-en-Y gastric bypass and a laparoscopic gastric sleeve were 28% and 26% respectively. Several comorbidities were resolved, including type 2 diabetes (95%), hypertension (74%), and dyslipidemia (60%), indicating that MBS is even more effective in adolescents than in adults.²²

Given this background, the importance of the policy statement issued by the American Academy of Pediatrics in December 2019 and the AAP Clinical Practice Guidelines in 2023 cannot be overstated.^{5,6} MBS has been found to be a safe and effective treatment for adolescents with severe obesity. The policy statement called for an increase in the numbers of pediatric-focused multidisciplinary MBS centers, ensuring access to adolescents who meet the criteria for surgery regardless of income, race, and ethnicity.

However, the number of adolescents helped with MBS was low. It is estimated that at least 600,000 US children have severe obesity, and only a small fraction undergo MBS.^{6,9}

According to the July 2021 US Census there are 2,670,596 children under 18 in Pennsylvania.²³ It is conservatively estimated that 4% or 106,824 children are struggling with severe obesity and therefore meet the criteria for MBS.¹⁰ If we were able to meet even 1% of this need, we would perform 1,000 operation or 10 times the number of operations now being completed in a year.

We have made progress in Pennsylvania. Since the AAP policy statement published in Pediatrics in 2019, the number of MBS operations performed in Pennsylvania on adolescents with severe obesity has increased from 50 operations per year to 92 operations per year, an 84% increase. This was primarily a result of the addition of three more pediatric multidisciplinary programs in the Greater Philadelphia region.

Much work needs to be done in Pennsylvania and across the nation. The goal of each location in Pennsylvania performing MBS for adolescents should be to develop a pediatric-focused multidisciplinary weight clinic that provides a full spectrum of non-surgical care including anti-obesity pharmaceuticals for children and adolescents. These clinics should strive to integrate pediatricians, dietitians, psychologists, social workers, and pediatric subspecialists as appropriate. The clinic should integrate a surgeon providing MBS for children and adolescents with severe obesity. Preoperative and postoperative care should be provided by the surgeon in a pediatric-focused multidisciplinary weight clinic.

The number of adolescent bariatric operations should increase in existing programs, and locations providing these services should increase to meet the obvious deficit in obesity care for children.

This study has several limitations. Information was obtained from telephone interviews and confirmed by email with the program directors, and the data could not be verified independently. In addition, the age range of the patients participating in the adolescent program varied between the programs. There may have been adolescent patients that who underwent MBS by a surgeon that did not participate in a multidisciplinary adolescent program.

CONCLUSION

Severe Obesity in adolescents is a major medical condition, with serious lifelong adverse consequences. Although some progress has been made in Pennsylvania since the AAP policy statement on metabolic and bariatric surgery for adolescents with severe obesity was published in December 2019, much remains to be done to improve access to this critical service and to improve the quality of adolescent bariatric surgery programs.

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