Abstract

Managing pediatric obesity in primary care requires the ability to identify the problem in a timely fashion. Once a high BMI is identified, a primary care physician can help patients control their weight better by taking a detailed history appropriate for the child’s age and psychosocial environment. A complete history, examination, and laboratory tests will identify comorbid conditions frequently associated with obesity, especially dyslipidemia, steatohepatitis, and insulin resistance. Use of the Seven Step Model for guidance will then encourage the family to take the necessary steps to manage this chronic disease.

Introduction

Primary care providers have a perfect opportunity to identify and initiate treatment for obese and overweight children as their healthcare gatekeepers for routine and acute medical care. However, an interventional opportunity for managing pediatric obesity treatment may be lost if the medical team focuses exclusively on acute symptoms such as asthma, gastroesophageal reflux, and headaches, and fails to address the root cause of many pediatric illnesses—overweight or obesity.

In the past, primary care providers sometimes failed to address pediatric obesity because they lacked effective approaches for the management of this condition. However, that situation has now changed. Since late 2007 two evidence-based recommendations were published that provide a clear, practical direction for the management of pediatric obesity. Both sets of recommendations concur that the primary care provider and team are truly the front line of a defense needed to slow, stop, and then reverse the pediatric obesity epidemic. The key elements of this front line are: (1) history; (2) physical examination; (3) laboratory and imaging studies; and (4) plan for referral.

History

The format can include intake questionnaires completed prior to the appointment, nursing intake during acquisition of vitals, and open-ended questions and motivational interviewing from the provider. Ideally, this approach provides a nonjudgmental and nonconfrontational interaction between the healthcare team, the patient, and the family. This history may reveal complicated issues such as divorce, depression, anxiety, social discord among
peers and siblings, past or present abusive situations, families in disadvantaged socioeconomic situations, or over-scheduled routines. Such issues complicate the process of implementing a healthy weight management program. To admonish the child and parent to “eat less and exercise more” without understanding these issues would create an empathic failure by minimizing the many dynamics that contribute to obesity.

Physical Examination

To monitor health during the various stages of growth providers can follow the longitudinal trajectory of a child’s weight, height, and BMI. This process makes BMI vitally important, equal in importance to blood pressure, heart rate, respiratory rate, and temperature. Determination of BMI begins with an accurate measurement of a child’s height and weight. Weight is best obtained using an electronic scale and a stadiometer is best to measure height. An error in determining either height or weight results in an inaccurate calculation of the child’s BMI.

By definition, overweight refers to a BMI between the 85th and 94th percentile and obese to a BMI equal or greater than the 95th percentile. Unlike adults in whom absolute BMI values define obesity ($\geq 30$) and overweight (25–29.9), the pediatric population depends on age and gender charts to identify the severity of the child’s obesity. The CDC pediatric BMI charts are the gold standard for calculating a child’s obesity status, beginning at age 2 (www.cdc.gov/healthyweight/assessing/bmi/childrens_BMI/about_childrens_BMI.html#What%20is%20BMI%20percentile). However, a child’s BMI can be determined prior to age 2 by using World Health Organization BMI growth charts (www.who.int/childgrowth/standards/weight_for_age/en/index.html). A qualitative assessment of fat folds should help determine the accuracy of the BMI calculations (particularly important in relatively muscular teenage boys whose BMIs can exceed the 94th percentile without signaling actual obesity).

Hypertension in an obese child is a common finding. Therefore, taking a patient’s blood pressure at every appointment is very important, especially since hypertension frequently is symptom-free and unless it is measured accurately, it may be missed. Proper cuff size for children whose BMI exceeds the 99th percentile along with having the child relax 10 to 15 minutes before taking the blood pressure will render the most accurate reading. Detection of hypertension in an obese child strongly suggests the possibility of other comorbidities.

Other potential comorbidities to consider in the physical examination include:

- The skin: inspect for acanthosis nigricans (a marker of insulin resistance and prediabetes); also in girls look for hirsutism and acne that may suggest polycystic ovaries; abdominal striae (pale versus pink, pink being more likely due to endocrine etiologies such as Cushing’s disease).
- The thyroid: palpate the thyroid while standing behind the patient; this optimizes the quality of the examination for detecting enlargement or nodes.
- The eyes: perform a thorough fundoscopic examination; look for signs of papilledema or reduced disc to cup ratio suggesting hypertension or pseudotumor cerebri (an increasingly identified comorbidity with obesity).
- The neck and oral cavity: inspect the upper airway carefully, especially for excessive fatty tissue around the neck or enlarged tonsils that might suggest obstructive sleep apnea.
- The lungs: auscultate the lungs listening for both inspiratory and expiratory findings suggesting conditions like asthma.
- The abdomen: palpate and percuss the right upper quadrant and epigastric areas for liver tenderness or enlargement and the epigastric area for discomfort,
looking for the possibility of steatohepatitis, gallstones, or reflux disease, all of which are more common in obese children than nonobese ones.

• The musculoskeletal system: perform a thorough hip, knee, and foot examination, looking for findings consistent with slipped capital femoral epiphysis, Blount disease, and flat arches of the feet. Note: obese patients who present with knee pain may have referred pain from a hip condition.

The provider’s thorough physical examination will help exclude the possibilities of unusual endocrinologic or other problems as primary causes, as well as assure the patient and parents that medical causes of obesity have been considered. This will enable the provider to direct the discussion toward the most likely modifiable factors, beyond the primary contributors of genetics and other biological diatheses.

**Laboratory Data and Radiographic Imaging**

Judicious ordering of laboratory data will assist the provider in screening for a possible medical etiology of the child’s obesity. For example, a screening cortisol level is required if the physical examination suggests Cushing’s and a thyroid-stimulating hormone (TSH) level to screen for Hashimoto’s hypothyroidism. Also, a fasting blood glucose level could indicate either glucose intolerance or diabetes and a lipid screening test may identify metabolic syndrome if the high-density lipoprotein (HDL) is low and/or the triglycerides are above 130. Finally, elevated liver transaminase levels (alanine transaminase [ALT], aspartate aminotransferase [AST], γ-glutamyl transpeptidase [GGT]) may identify nonalcoholic steatohepatitis (NASH), which is inflammation of the liver on the cellular level and can progress to cirrhosis.

Imaging studies (such as liver ultrasonography or computed tomography [CT] scans) are not routinely done. However, in the presence of elevated liver transaminases, such studies are needed to identify a fatty liver, which would suggest the child already has NASH. If such a condition is identified then a consultation with a gastroenterologist for further investigations is warranted. If NASH is present in an obese child then weight loss is essential for the liver to heal itself. There is no medical treatment for this condition.

**Plan for Referral: A Case Study Using the Seven Steps to Success**

**Step 1. Medical Management**

James, 15 years old, was brought to his pediatrician’s office (Dr. Hall). Since James’ last visit about a year ago his BMI went from the 85th to more than the 98th percentile and his blood pressure went from 123/80 to 139/89. James’ laboratory results and physical examination were normal. Dr. Hall indicated to James’ mother that there were no major medical problems that caused James increase in weight, but that James had a serious problem of excess weight.

**Step 2. Education**

Dr. Hall then expressed concern about the health implications regarding James’ weight, especially with respect to his blood pressure, and the possible future condition of his liver, cholesterol, and blood glucose. Dr. Hall also gave them the Seven Steps Handout, which outlined the potential course of treatment.

James and his mother needed three essential tools, including pedometers for both of them and a calorie-counting book or website. The goals were a weight loss of 1–2 pounds per week; consuming an average of 1500 kcal/d, minimizing consumption of fat; and walking an average of 10,000 steps per day. Dr. Hall also gave them a copy of Boutelle et al.’s review of popular books on pediatric obesity and suggested that they get one or more that seem most relevant.

**Step 3: Environmental Changes**

James returned a month later to report a limited success in losing weight. He lost 3 pounds—the first time in his life he had lost weight. His mother had made changes to the foods in the house (e.g., eliminating all high-fat foods) and lost several pounds herself.

**Step 4: Support Group**

James returned 1 month later having lost 5 pounds and felt better about himself. He had joined an Internet forum and was actively engaged in corresponding with other overweight teens.
Steps 5 and 6: Cognitive–Behavioral Therapy—Short and Long Term Immersion

James returned to Dr. Hall’s office having gained 2 pounds. He was frustrated. Dr. Hall explained that James and his family might benefit from more intensive therapy. He recommended finding a nearby therapist trained in cognitive-behavioral therapy (CBT, via abct.org “Find a Therapist”) and registering for an immersion CBT program (referencing the options listed in the Seven Steps Handout).

Step 7: Bariatric Surgery

Dr. Hall discussed with James that if he fails to control his weight in future, James may consider bariatric surgery. However, given James’ internal desire, his insight into making behavior changes, his relatively low BMI, and support from others, James most likely will be successful in achieving a healthier weight without this most extreme intervention.

Author Disclosure Statement

No competing financial interests exist.

References


