Childhood Obesity Treatment

Obesity Reduction Strategic Initiative

A Toolkit For Louisiana Primary Care Providers

BCM

PENNINGTON BIOMEDICAL RESEARCH CENTER LSU

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Provided by:
Baptist Community Ministries
Pennington Biomedical Research Center

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Scope of Work and Deliverables:

The scope of work included cumulative research into current trends in obesity prevention and reduction initiatives that have demonstrated efficacy when implemented in the clinical setting of primary care. Particular focus has been placed on evidence-based models that might be utilized with under or uninsured populations seeking care among safety net providers. The following toolkit summarizes research findings for primary care practices interested in pursuing this type of programming.

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PART ONE 01

Clinical Assessment of Childhood Obesity

The U.S. Preventive Services Task Force recommends that clinicians screen children aged 6 years and older for obesity and offer them or refer them to comprehensive, intensive behavioral intervention to promote improvement in weight status. In this section, we describe the ways to assess for obesity.[32]

Whom to Assess:

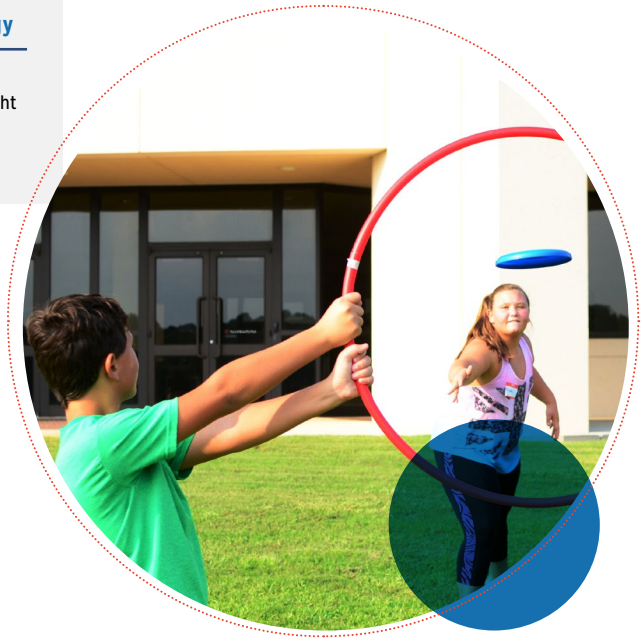
The American Academy of Pediatrics recommends that body mass index (BMI) is calculated and plotted at every well child visit,[1] regardless of a child's age or weight.

Who is At Higher Risk?

Children should be further screened for weight-related complications if overweight or obese, or if the following risk factors are present:

1) One or both parents are obese
2) One or more siblings are obese
3) Chronic disease or disability limits a child's mobility

BMI Category	Terminology
<5th percentile	Underweight
5th-84th percentile	Healthy Weight
85th-94th percentile	Overweight
≥95th percentile	Obesity



Calculating BMI Percentile:

Use standardized clinical procedures to assess height and weight at each patient visit.

Plot the BMI using the U.S. Centers for Disease Control and Prevention Growth Chart to account for sex and height differences in growth during childhood. Plotting can be done by hand. Alternatively, BMI percentile can be automatically calculated in many electronic medical records upon entering the child's height, weight, date of birth, date of visit, and sex.

Dietary and Physical Activity Habits

Food and activity diaries are time-consuming for the patient and family and may not be feasible in a typical office setting. Instead, a few simple questions can provide insight into a child's dietary and physical activity habits. One rapid assessment is the Weight, Activity, Variety (in diet), and Excess (WAVE) tool.[2]

Assess the **barriers** to and **facilitators** for healthy eating and physical activity in children and adolescents.[3] Focus on modifiable behaviors.

KEY DIETARY QUESTIONS

- How much 100% fruit juice is consumed per day?
- What is your breakfast frequency per week and quality of food?
- How many fruit and vegetable servings should you consume per day?
- What are the number of meals and snacks per day and quality?
- How many sweetened beverages are consumed per day?
- What is the frequency of eating foods prepared outside the home?
- How many portions are consumed that are inappropriate for age?
- What is your consumption of high energy dense foods?

KEY PHYSICAL ACTIVITY QUESTIONS

- How much time is spent in moderate to vigorous physical activity each day?
- How much time is spent in sedentary behaviors like watching TV, playing video games, browsing internet, etc?

Family Medical History and Habits

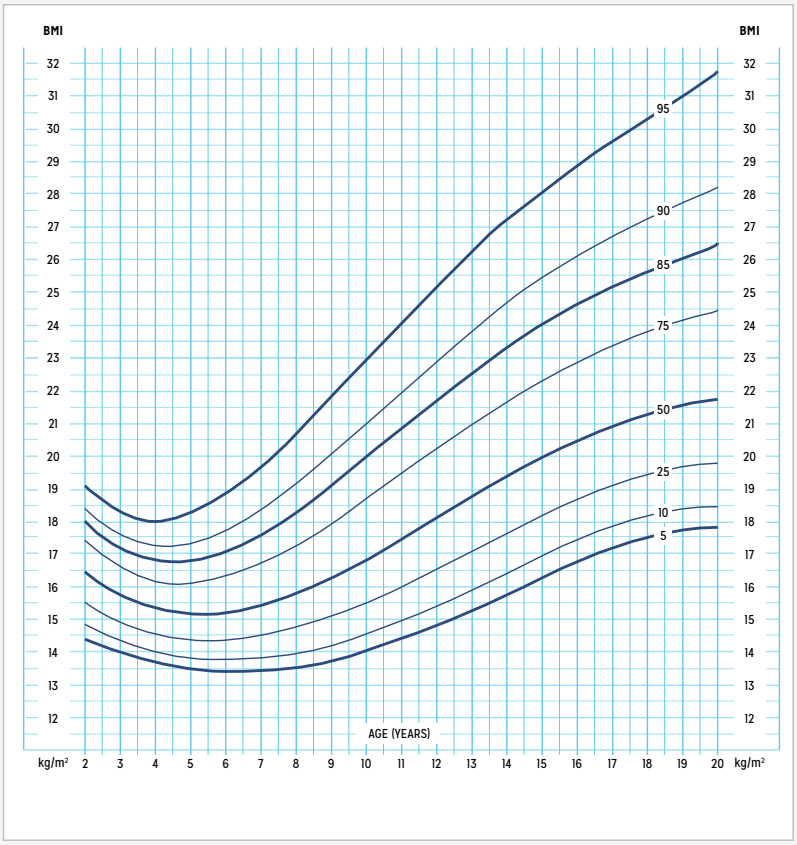
Pay special attention to family history of obesity, type 2 diabetes mellitus, and cardiovascular disease (especially hypertension) in first-degree relatives (parents, siblings) and second degree relatives (e.g. grandparents).[4] Various factors such as family medical history, genetic factors, and socioeconomic conditions influence the development of overweight and obesity in children.

Assess the family's understanding of proper nutrition and the importance of physical activity. Active parents influence their children to be more active whereas children of inactive parents are likely to be more sedentary.[5] Specific family eating practices such as where the food is eaten and how the food is offered should also be assessed.

WAVE ASSESSMENT TOOL

WEIGHT (BMI PERCENTILE)

Assess patient's Body Mass Index.* Patient is overweight if between 85th and 95th percentile. Patient is obese if ≥ 95th percentile.



*This is the growth chart for girls. The growth chart for boys can be found on the CDC's website: http://www.cdc.gov/growthcharts/clinical_charts.htm.

ACTIVITY

Ask patient about any physical activity in the past week: walking briskly, jogging, gardening, swimming, biking, dancing, golf, etc.

1. Does patient do 1 hour of moderate activity on most days/wk.?
2. Does patient do "lifestyle" activity like taking the stairs instead of elevators, etc.?
3. Does patient usually watch less than 2 hours of TV or DVDs/day?

If patient answers NO to above questions, assess whether patient is willing to increase physical activity.

VARIETY

Is patient eating a variety of foods from important sections of the food pyramid?

- Grains (6-11 servings)
- Fruits (2-4 servings)
- Vegetables (3-5 servings)
- Protein (2-3 servings)
- Dairy (2-3 servings)

Determine variety and excess using one of the following methods:

- Do a quick one-day recall.
- Ask patient to complete a self-administered eating pattern questionnaire.

EXCESS

Is patient eating too much of certain foods and nutrients?

Too much fat, saturated fat, calories:

- > 6 oz/day of meat
- Ice cream, high fat milk, cheese, etc.
- Fried foods or foods cooked with fat
- High fat snacks and desserts
- Eating out > 4 meals/wk

Too much sugar, calories:

- High sugar beverages
- Sugary snacks/desserts

Too much salt:

- Processed meats, canned/frozen meals, salty snacks, added salt

Reproduced with permission from Brown University.[2] Adapted for pediatric population.

Definable Causes of Obesity and Medical Comorbidities

Assess for genetic-based and endocrine-related causes like Prader-Willi syndrome, Turner's syndrome, hypothyroidism, and Cushing's syndrome. Certain classes of medications like antipsychotic agents, selective serotonin reuptake inhibitors, tricyclic antidepressants, anticonvulsants, mood stabilizers, prednisone, and oral contraceptives are associated with weight gain. Clinicians should monitor medication usage and consequent weight gain.

Laboratory Assessments

Children with a BMI of 85th to 94th percentile should be checked for fasting lipid levels every 2 years for children ≥ 10 years of age regardless of other risk factors. If other risk factors are present, then fasting glucose, ALT, and AST levels should also be measured.

Irrespective of any risk factors, children with a BMI ≥ 95th percentile should be checked for fasting glucose, ALT, and AST levels every 2 years starting at 10 years of age. Elevation of ALT or AST levels above 60 U/L on 2 occasions may prompt a need for referral to a pediatric gastroenterologist/hepatologist.[3]

RECOMMENDED LABORATORY TESTING[3]

BMI	TESTS
≥85th percentile, with no risk factors	Fasting lipid levels
≥85th percentile, with risk factors (e.g. family history of obesity-related diseases, elevated blood pressure, elevated lipid levels, or tobacco use)	Fasting lipid levels, AST and ALT levels*, and fasting glucose levels
≥95th percentile	Fasting lipid levels, AST and ALT levels*, and fasting glucose levels

*AST indicates aspartate aminotransferase; ALT = alanine aminotransferase.

FIFTEEN-MINUTE OBESITY PREVENTION PROTOCOL[3]

	ACTION STEP	MODEL LANGUAGE
STEP 1. ASSESS	Assess weight and height and convert to BMI percentile	
	Provide BMI percentile information	Doctor: "We checked your child's BMI, which is a way of looking at weight and taking into consideration how tall someone is. Your child's BMI is in the range where we start to be concerned about extra weight causing health problems."
	Elicit parent's concerns	Doctor: "What concerns, if any, do you have about your child's weight?" Patient: "He did jump 2 sizes this year. Do you think he might get diabetes someday?"
	Assess sweetened beverage, fruit, and vegetable intake, television viewing and other sedentary behaviors, frequency of fast food or restaurant eating, consumption of breakfast, and other factors	(Use verbal questions or brief questionnaires to assess key behaviors) Example: About how many times a day does your child drink soda, sports drinks, or powdered drinks like Kool-Aid?
	Provide positive feedback for behavior(s) in optimal range; elicit response; reflect/probe	Doctor: "You are doing well with sugared drinks." Patient: "I know it's not healthy. He used to drink a lot of soda, but now I try to give him water whenever possible. I think we are down to just a few sodas a week." Doctor: "So, you have been able to make a change without too much stress."
	Provide neutral feedback for behavior(s) in suboptimal range; elicit response; reflect/probe	Doctor: "Your child watches 4 hours of television on school days. What do you think about that?" Patient: "I know it's a lot, but he gets bored otherwise and starts picking an argument with his little sister. So, watching TV keeps the household calm."
STEP 2. SET AGENDA	Query which, if any, of the target behaviors the parent/child/adolescent may be interested in changing or which might be easiest to change	Doctor: "We've talked about eating too often at fast food restaurants, and how television viewing is more hours than you'd like. Which of these, if either of them, do you think you and your child could change?" Patient: "Well, I think fast food is somewhere we could do better. I don't know what he would do if he couldn't watch television. Maybe we could cut back on fast food to once a week."
	Agree on possible target behavior	Doctor: "That sounds like a good plan."
STEP 3. ASSESS MOTIVATION AND CONFIDENCE	Assess willingness/importance	Doctor: 'On a scale of 0 to 10, with 10 being very important, how important is it for you to reduce the amount of fast food he eats?"
	Assess confidence	Doctor: "On a scale of 0 to 10, with 10 being very confident, assuming you decided to change the amount of fast food he eats, how confident are you that you could succeed?"
	Explore importance and confidence ratings with the following probes:	
	Benefits	Doctor: "You chose 6. Why did you not choose a lower number?" Patient: "I know all that grease is bad for him."
	Barriers	Doctor: "You chose 6. Why did you not choose a higher number?" Patient: "It's quick and cheap and he loves it, especially the toys and fries." Reflection: So there are benefits for both you and him.
	Solutions	Doctor: "What would it take you to move to an 8?" Patient: "Well, I really want him to avoid diabetes. My mother died of diabetes, and it wasn't pretty; maybe if he started showing signs of it; maybe if I could get into cooking a bit more."
STEP 4. SUMMARIZE AND PROBE POSSIBLE CHANGES	Query possible next steps	Doctor: "So where does that leave you?" or "From what you mentioned it sounds like eating less fast food may be a good first step," or "How are you feeling about making a change?"
	Probe plan of attack	Doctor: "What might be a good first step for you and your child?" or "What might you do in the next week or even tomorrow to help move things along?" or "What ideas do you have for making this happen?" (If patient does not have any ideas) "If it's okay with you, I'd like to suggest a few things that have worked for some of my patients."
	Summarize change plan; provide positive feedback	Involving child in cooking or meal preparation, ordering healthier foods at fast food restaurants, and trying some new recipes at home.
STEP 5. SCHEDULE FOLLOW-UP VISIT	Agree to follow-up visit within x weeks/months	Doctor: "Let's schedule a visit in the next few weeks/months to see how things went."
	If no plan is made	Doctor: "Sounds like you aren't quite ready to commit to making any changes now. How about we follow up with this at your child's next visit?" or "Although you don't sound ready to make any changes, between now and our next visit you might want to think about your child's weight gain and lowering his diabetes risk."

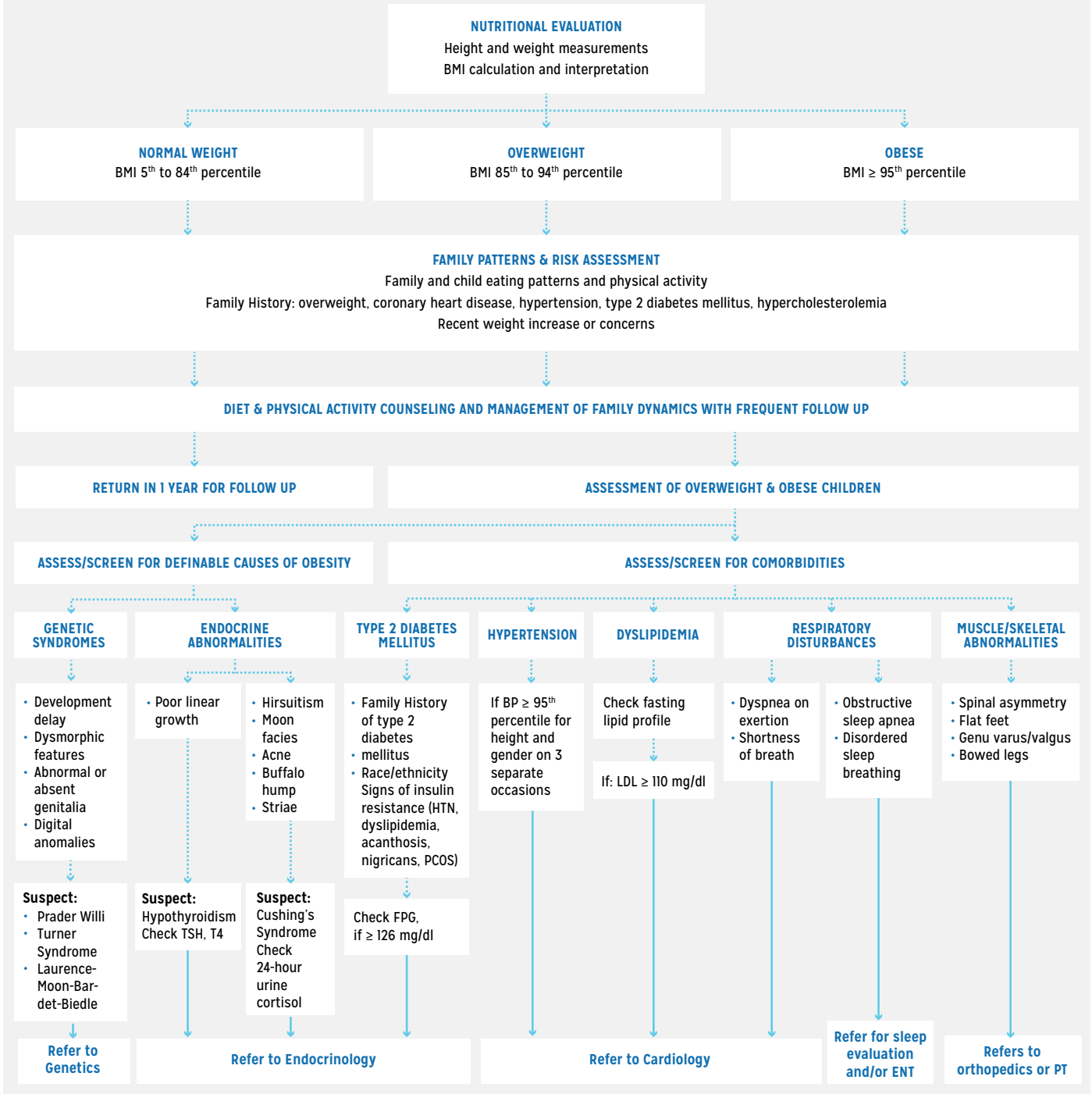
During the review of systems in the physical examination, the following symptoms should be considered as potential consequences of a child's obesity.

REVIEW OF SYSTEMS FOR WEIGHT RELATED PROBLEMS[4]

SYMPTOMS	EXPLANATION	POTENTIAL CONSEQUENCES/COMMENTS
Sleep problems		
Loud snoring or apnea (prolonged intervals without respiratory effort)	Obstructive sleep apnea	Poor sleep efficiency, poor attention, poor academic performance, pulmonary hypertension, right ventricular hypertrophy, or enuresis
Shorter sleep time, later onset of sleep, daytime sleepiness, or restlessness	Disordered sleep	Depression, poor attention, poor academic performance, food cravings, or difficulty responding to satiety cues
Respiratory problems		
Shortness of breath, exercise intolerance, wheezing, or cough	Asthma	Progression of disease, resistance to treatment, exacerbation of excessive weight gain, or exacerbation of asthma with weight gain
Gastrointestinal problems		
Vague recurrent abdominal pain	Nonalcoholic fatty liver disease	Fatty deposits in liver; small percentage progresses to steatohepatitis, cirrhosis, and future hepatocarcinoma
Heartburn, dysphagia, regurgitation, or chest or epigastric pain	Gastroesophageal reflux	Increased abdominal pressure or esophagitis
Abdominal pain and/or distention, flatulence, fecal soiling/encopresis, anorexia, or enuresis	Constipation	Disordered eating pattern, physical inactivity, or decreased social interaction
Right upper quadrant or epigastric pain or vomiting and colicky pain	Gall bladder disease, with or without gallstones	Cholecystectomy (most patients with gallstones are asymptomatic)
Endocrine disorders		
Polyuria and polydypsia	Type 2 diabetes mellitus (T2DM)	Lack of symptoms is normal for T2DM; unexpected weight loss may occur and may not indicate compliance with treatment of obesity
Menstrual irregularities		
Oligomenorrhea (<9 menses per y) or dysfunctional uterine bleeding (anovulation)	Polycystic ovary syndrome	Insulin resistance, metabolic syndrome, T2DM, infertility, or worsening obesity with worsening of aforementioned conditions
Orthopedic problems		
Hip pain, groin pain, thigh pain, painful gait, or waddling gait	Slipped capital femoral epiphysis	Permanent hip deformity and dysfunction, decreased physical activity, or worsening obesity
Knee pain	Slipped capital femoral epiphysis or Blount disease	Decreased physical function, decreased physical activity, or worsening obesity
Foot pain	Increased weight-bearing	Decreased physical activity or worsening obesity
Mental Health		
Psychiatric conditions		
Flat affect or sad mood, loss of interest/pleasure, or worries/fears	Depression or anxiety	Worsening obesity, suicide, or eating disorder
Psychosocial conditions		
Body dissatisfaction, school avoidance, problems with social interactions, poor self-esteem, or neglect	Depression or anxiety	Worsening obesity
History/ongoing sexual abuse	Depression or anxiety	Worsening obesity
Hyperphagia or binge eating, eating "out of control," or bulimia	Disordered eating	Worsening obesity; medications may cause/exacerbate obesity
Genitourinary problems		
Nocturia or nocturnal enuresis	Disordered sleep	Worsening obesity
Skin conditions		
Rash or irritations acne	Intertrigo attributable to increased skin-to-skin contact with persistent moisture	More serious skin infections and abscesses

SUGGESTED ACTION PLAN TO ASSESS AND INTERVENE ON CHILDHOOD OBESITY[6]

CHILDHOOD OVERWEIGHT: ASSESSMENT & ACTION IN THE PRIMARY CARE SETTING[6]



BMI - body mass index
BP - blood pressure
TSH - thyroid-stimulating hormone
T4 - thyroxine
FPG - fasting plasma glucose
LDL - low-density lipoprotein cholesterol
ENT - ear nose and throat doctor
PT - physical therapist

PART TWO 02

Stages of Treatment for Childhood Obesity

The U.S. Preventive Services Task Force recommends that clinicians screen children aged 6 years and older for obesity and offer them or refer them to comprehensive, intensive behavioral intervention to promote improvement in weight status.[32] In this section, we describe the recommended stages of obesity treatment.

The major goal in the treatment of obese children and adolescents is for a child to develop healthy lifestyle habits that ultimately improve health and well-being in the long-term. In young obese children or mildly obese children, weight maintenance is the major focus rather than weight loss as they have not yet attained adult height.[6] For older children and adolescents, weight loss is the desired outcome.

A four-tiered systematic approach is suggested, one that begins with a brief office-based intervention and then escalates in intensity based on a child's degree of obesity, the family's motivation, and the capacity of the provider's office. Select the appropriate stage depending on the patient's age, response to prior treatment attempts, motivation level, and comorbidities.[3] Lack of improvement in a patient's weight or BMI percentile over 3 to 6 months may warrant progression to the next stage of obesity treatment.

Summaries of the stages of treatment are included below. For further information, consult the Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity endorsed by the American Academy of Pediatrics[3] and a recent overview of the prevention and treatment of pediatric obesity.[7]

Stage 1: Prevention Plus

Overweight and obese children and their families should concentrate on fundamental healthy dietary and physical activity habits. Assist families in identifying current behaviors, cultural preferences, individual financial situations, daily schedules, and the safety of their neighborhood. These factors might be the barriers to adopting healthy eating and physical activity habits. Work with the family to determine target behaviors, such as:

1) Consume ≥ 5 servings of fruits and vegetables per day (www.choosemyplate.gov)
2) Minimize or remove sugar-sweetened beverages from the diet
3) Limit screen time to ≤ 2 hours per day
4) Engage in moderate to vigorous physical activity ≥ 1 hour every day
5) Involve the whole family in lifestyle modifications
6) Encourage child to self-regulate meals and avoid over-restrictive feeding habits

IMPLEMENTATION:

Stage 1 can take place in the clinic setting. Appropriate follow-up visit frequency is based on the motivation of the patients and their families, or the severity of obesity. If the provider has not noticed any improvement in the child's behaviors or no reduction in the child's BMI after 3 to 6 months, progress to the next level of care.

Stage 2: Structured Weight Management

At this stage, the primary care physician or the allied health care professional offers support and structure to a child to achieve the Stage 1 behaviors. Behavior change goals include:

1) Child and/or parent maintains a log to monitor the behaviors, such as daily screen time and 3-day recording of food and beverages consumed
2) Create a daily eating plan with structured daily meals and planned snacks (done by a registered dietitian or a physician who has been trained to developing pediatric eating plans)
3) Engage in planned, monitored physical activity or active play for 1 hour per day
4) Parents may offer planned incentives to reinforce targeted behaviors

IMPLEMENTATION:

The pediatrician or the clinic's staff can provide most of this treatment, though staff may need additional training to create an eating plan, conduct motivational interviewing, and teach monitoring and reinforcement techniques. The physician may refer the patient to a dietitian. Depending on the needs of the individual child and family, a physician may offer a referral to an exercise therapist in order to establish physical activity habits. Group sessions may be effective. At this stage, monthly follow-up visits are most appropriate.

Stage 3: Comprehensive Multidisciplinary Intervention

At this stage, children and families receive more intense and frequent behavior modification with specialists trained in dietary monitoring and behavioral change techniques. The following target behaviors and components should be integrated:

1) A structured program with food monitoring, short-term diet and physical activity goal setting, and a contingency management plan
2) Achieve negative energy balance to produce weight loss
3) Parental involvement in the behavioral modification sessions is required for children <12 years of age - older children may require less assistance from their parents
4) Parents should learn how to modify the home environment to support healthy behaviors

IMPLEMENTATION:

Compared to the prior stage, Stage 3 requires an increased level of allied health care provider involvement, intensity of behavior changes, and frequency of visits. It may be beyond the capacity of a traditional physician's office to provide treatment at this level. However, the physician's office could coordinate with other members of a multidisciplinary team who have experience in childhood obesity including a behavioral counselor, a registered dietitian, and an exercise specialist. Primary care physicians should identify local resources like child psychologists and community resources (e.g. parks, recreation facilities and appropriate commercial exercise programs) and other appropriate referral organizations and centers. Weekly follow-up visits for at least 8 to 12 weeks are useful to monitor and sustain new behaviors. Group visits may be more cost-effective and offer additional benefits to the patient.

Stage 4: Tertiary Care Intervention

The following interventions are provided to severely obese children:

- **Medications:** Orlistat is currently the only drug approved by U.S. Food and Drug Administration for the treatment of childhood obesity. Orlistat causes fat malabsorption by inhibiting enteric lipase.[3] It is used for patients ≥ 12 years of age.[7] Efficacy of this medication is modest only when used in conjunction with diet and exercise.
- **Very Low Calorie Diet:** There is little evidence evaluating the use of a very low calorie diet in children or adolescents. Typically a highly restrictive diet is the first step, followed by a mildly restrictive diet, though there are no published data on long-term outcomes for children.
- **Weight Control Surgery:** Children who are not responsive to behavioral changes may benefit from bariatric surgeries like gastric bypass or gastric banding. These surgical efforts have led to substantial weight loss and improved comorbidities.[8] The American Society for Metabolic and Bariatric Surgery Pediatric Committee recommend these guidelines for pediatric eligibility:[8,9]
  - Bariatric surgery is not recommended until children have reached physical maturity (usually around age 13 for girls and age 15 for boys.)
  - BMI of ≥ 35 kg/m^2 with major comorbidities (i.e. type 2 diabetes, moderate to severe sleep apnea, pseudotumor cerebri, or severe non-alcoholic steatosis)
  - Or BMI ≥ 40 kg/m^2 with other comorbidities (e.g. hypertension, insulin resistance, glucose intolerance, substantially impaired activities of daily living or quality of life, dyslipidemia, sleep apnea with apnea-hypopnea index >15)

The physician, parents, and adolescent should also consider the adolescent's cognitive, emotional, and social development and decision-making abilities.

IMPLEMENTATION:

These intensive interventions should occur in a pediatric weight management center that offers comprehensive services, including a physician or nurse practitioner, registered dietitian, behavioral counselor, and exercise specialist. Patients should be closely evaluated based on age, severity of obesity, motivation and emotional development, prior efforts to control weight, and family support before entering an intensive weight loss program. Insurance coverage and access to care should also be considered.

WEIGHT GOALS AND INTERVENTION STAGES[3]

AGE	BMI CATEGORY	WEIGHT GOAL TO IMPROVE BMI PERCENTILE	INITIAL INTERVENTION STAGE	HIGHEST INTERVENTION STAGE
<2 years	Weight for height	NA	Prevention counseling	Prevention counseling
2 – 5 years	5th – 84th percentile or 85th – 94th percentile with no health risks	Weight velocity maintenance	Prevention counseling	Prevention counseling
	85th – 94th percentile with health risks	Weight maintenance or slow weight gain	Prevention Plus (Stage 1)	SWM (Stage 2)
	≥95th percentile	Weight maintenance (weight loss of up to 1 lb/month may be acceptable if BMI > 21 or 22 kg/m^2)	Prevention Plus (Stage 1)	CMI (Stage 3)
6 – 11 years	5th – 84th percentile or 85th – 94th percentile with no health risks	Weight velocity maintenance	Prevention counseling	Prevention counseling
	85th – 94th percentile with health risks	Weight maintenance	Prevention Plus (Stage 1)	SWM (Stage 2)
	95th – 99th percentile	Gradual weight loss (1 lb/month)	Prevention Plus (Stage 1)	CMI (Stage 3)
	>99th percentile	Weight loss (maximum 2 lbs/week)	Prevention Plus (Stage 1 or 2 or 3 if family is motivated)	TCI (Stage 4), if appropriate
12 – 18 years	5th – 84th percentile or 85th – 94th percentile with no health risks	Weight velocity maintenance; after linear growth is complete, weight maintenance	Prevention counseling	Prevention counseling
	85th – 94th percentile with health risks	Weight maintenance or gradual weight loss	Prevention Plus (Stage 1)	SWM (Stage 2)
	95th – 99th percentile	Weight loss (maximum 2 lbs/week)	Prevention Plus (Stage 1)	TCI (Stage 4), if appropriate
	>99th percentile	Weight loss (maximum 2 lbs/week)	Prevention Plus (Stage 1 or 2 or 3 if family is motivated)	TCI (Stage 4), if appropriate

BMI - body mass index
NA - not applicable
SWM - structured weight management

CMI - comprehensive multidisciplinary intervention
TCI - tertiary care intervention

Potential Impact on Clinical Practice

- Many providers are not comfortable with providing repeated counseling on healthy eating and physical activity behaviors to children and families at every office visit.
- Insurance providers can access the website of American Academy of Pediatrics for appropriate coding on obesity care.
- Continued medical education may alleviate physicians' concerns and improve obesity management. Providers reported increased self-efficacy in addressing weight problems with children and the families following extensive training, including motivational interviewing, nutrition education, physical activity education, and behavioral goal setting.[10]

PART THREE 03

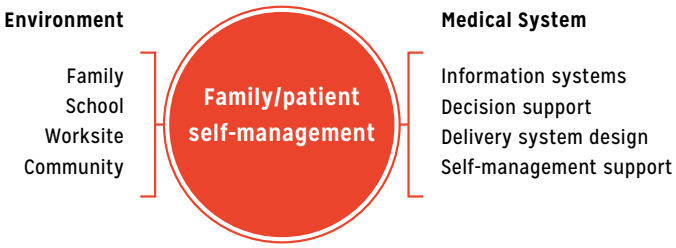
Program Components that Enhance Efficacy for Weight Loss

In order to facilitate the management of obesity in children, a chronic care model that integrates the health care system, patient self-management, and community resources like exercise programs is required. A typical primary care clinical setting model geared towards addressing acute conditions may not be structured to handle multidisciplinary management of chronic conditions like pediatric obesity where patient self-education plays a major role.[3]

Target behaviors that meet and follow criteria should be the focus for implementation[11]:

1) A specific behavior that may prevent obesity
2) A behavior that positively influences child's health even though it may not impact obesity
3) A behavior that causes no harm to the child

Obesity Chronic Care Model[3]



Family-Based Approach

Parents have the authority to modify their child's environment, especially foods purchased, meal planning and preparation, and portion sizes.[12] Parents could alter a child's daily activity levels by controlling television watching and other screen time and engaging their child in unstructured play or age-appropriate household chores. Primary care providers can support parents by providing nutrition education and encouraging authoritative parenting practices to positively influence a child's habits.[3]

Family-based group therapy is cost-effective, as children tend to be more compliant when attending with parents. Also, group therapy lowers the provider to patient ratio thereby saving time and resources. This family-based approach can produce significant weight losses in both short and long term.[13] Family based strategies to control weight changes include[14]:

1) Controlling the child's environment
2) Monitoring behavior
3) Setting goals
4) Rewarding successful behavior changes

Comprehensive behavioral family lifestyle interventions have shown significant increase in the degree of weight loss in adolescents who are overweight or obese, compared to interventions that solely target the adolescent.[15]

Motivational Interviewing

Motivational interviewing is based on the concept of change theory. Motivational interviewing features nonjudgmental questioning and reflective listening. Initially, the patient or the family is unaware of the problem. Once the parent recognizes the problem, a clinician can motivate the person to work towards a desired behavior in the context of the person's family, school, and neighborhood environments. Rather than imposing a particular behavior on the patient or the family, motivational interviewing yields better weight loss results in the short- and long term.[16]

Various techniques of motivational interviewing are taught to pediatricians and registered dietitians in the primary care setting. This method is well accepted by the parents.[16,17] The Academy of Nutrition and Dietetics conducts motivational interviewing seminars at a local and national level.

For more information, visit http://www.eatright.org/

Self-Monitoring and Goal Setting

The success of any intensive combined lifestyle intervention will depend on the level of self-regulating and self-monitoring of the patients in relation to food intake and energy expenditure. A clinician can tailor treatment based on a child's current health behaviors and his/her goals for behavior change. Later, clinicians can teach children and adolescents to enhance their general ability to self-regulate food intake using various behavioral change techniques.[18]

Importance of Achieving Weight Change in the First Three Months

Early weight change is an important and stable predictor for long-term prognosis of weight management and success of an intervention. Obese children who received family based behavioral therapy were followed for 2 years, and the amount of weight lost during the first 3 months of therapy had a very high predictive value of long-term success of the program.[19] An increased focus on monitoring and goal-setting during this early time frame may significantly improve the chances for successful weight loss over the long-term. Also, identifying children who do not successfully change weight during the first 3 months may help clinicians to explore alternative treatment options rather than continuing an ineffective behavioral program.

Importance of Follow-up Assessment

Follow-up assessment is essential to ensure the long-term reduction in weight and long-term improvement in cardiovascular risk factors. Follow-up assessment will also help to ensure that positive behavior changes like healthy dietary and physical activity habits are maintained once a child has completed the intensive program. During follow-up assessment, clinicians should continue to monitor body weight, BMI, blood pressure, and serum levels of cardiovascular risk factors (e.g. LDL cholesterol, HDL cholesterol, triglycerides, and insulin).[20-22]

Technology Integration

Recent technological advances have significantly improved clinicians' ability to monitor their patients in weight loss/management interventions. The Internet and other communication technologies (e.g. text messaging, video conferencing) have quickly become more affordable and accessible for the general population and show potential as modes to deliver health and weight management interventions to children, adolescents, and their families.[23,24] As web-based studies targeting youth are relatively new, future research will need to increase methodological rigor, evaluate long-term effectiveness, evaluate cost-effectiveness, and determine applicability and suitability across youth of different demographics.

Pedometers and accelerometers are examples of modern technology that may assist clinicians, and a child and caregiver, in measuring children's free-living levels of physical activity outside of the clinical setting.[25,26] Pedometers measure the number of steps taken over a period of time. Accelerometers distinguish how fast a person is moving to determine the intensity level of physical activity a person has completed (e.g. low, medium, high intensity). These devices have become more sophisticated in recent years. Commercially available physical activity trackers (e.g. Nike FuelBand, Fitbit, Jawbone) have become more affordable and easier to wear, which may help clinicians, patients, and families to track physical activity levels to help youth meet the recommended levels of moderate-to-vigorous physical activity.

Other popular technologies can be used to promote physical activity or healthy eating. For instance, mobile health technologies including smartphone applications provide additional ways for patients, parents, and physicians to monitor physical activity and eating patterns.[7] These technologies provide immediate feedback to motivate behavior change. Video games that incorporate physical activity (coined "exergames") like Microsoft Kinect or Nintendo Wii can also promote moderate-intensity activity, turning a sedentary pastime into an active pursuit.[7]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PART FOUR 04

Special Considerations for Underinsured Populations

Surprisingly, few studies of pediatric obesity treatment programs administered through primary care clinics have specifically examined under or uninsured populations. A meta-analysis found 40 obesity treatment or prevention studies that included minority children.[27] Interventions with at least 3 to 4 components were more effective than those with fewer components. Parental involvement, culturally-based adaptation of program materials, and integrating interactive computer programs were all effective strategies for producing weight change in children. Below, we discuss key considerations for treating pediatric obesity in under and uninsured populations, as well as ethnic minority groups, using the consensus statement of Shaping America's Health and the Obesity Society.[33]

Obesity Prevention Considerations for Under and Uninsured Patients

- Prevention efforts should fall within the framework of the socio-ecological model, which considers a child in the context of the family, community, and culture.
- The primary care provider should routinely discuss obesity risk with children and families. These discussions need to vary in frequency based on a child's risk of obesity (which is particularly high in African American girls and Hispanic boys), should be culturally sensitive, and should take into account the education level and socioeconomic status of the family.
- Efforts should prevent gestational diabetes mellitus and low birth weight.
- Health care providers should play an active role in advocacy for local and national policies that foster a healthy environment for all children, including:
  - Restriction of youth-targeted television advertising of foods of low nutritional value
  - Promotion of regular physical activity and healthy food choices in schools
  - Provision of safe places for children to play and access to healthy food choices in underresourced neighborhoods

Obesity Treatment Considerations for Under and Uninsured Patients

- Treatment should begin early, targeting children at increased risk for long-term obesity and its complications.
- The health care team, child, and caregivers should mutually agree on treatment goals.
- Health care providers should be aware of racial/ethnic, cultural, and sex differences in the perception of obesity that may influence these goals.
- Consider cultural, individual, and family preferences and the realities of time and money in advice regarding meal planning.
- Consider cultural and gender preferences with regard to advice about physical activity.
- Evidence for the benefits of comprehensive lifestyle interventions including behavioral modification is currently based primarily on studies of white middle-class children. This evidence needs to be expanded through more studies targeting children of lower socioeconomic and income levels and non-white race/ethnicity.
- Although some evidence suggests that the effects of weight loss medications or bariatric surgery may differ among racial or ethnic groups, decisions about the use of these interventions in children should not be based on race or ethnicity.

PART FIVE 05

Model Programs for Childhood Obesity Treatment

From an extensive literature search, four childhood obesity treatment programs that were administered in primary care settings were selected as models for Louisiana physicians.

SHAPEDOWN

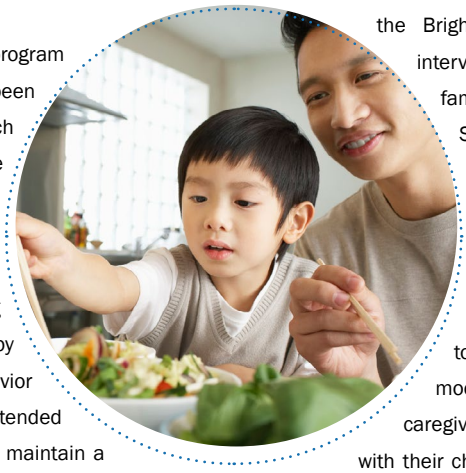
SHAPEDOWN is an obesity intervention program developed by faculty members of the School of Medicine at the University of California, San Francisco. The program has been implemented in a variety of settings for over 30 years and is continually reviewed and revised to reflect updated research and clinical applications regarding child overweight and obesity. SHAPEDOWN is a family-based intervention that is designed to take the social, cognitive, and emotional needs of children and adolescents of different backgrounds and abilities into consideration. Program participants attend group meetings held by a trained health professional for 12 weeks. Additionally, patients receive an age-appropriate SHAPEDOWN program workbook and parents receive the corresponding guidebook to facilitate the intervention. Through its holistic and sustainable approach to obesity treatment, SHAPEDOWN has demonstrated effectiveness in improving children and adolescents' relative weight, weight-related behaviors, self-esteem, weight management knowledge, and depression.[28]

Website: http://www.shapedown.com/

Mind, Exercise, Nutrition, Do it! (MEND)

The Mind, Exercise, Nutrition, Do it! (MEND) program was developed in the United Kingdom and has been implemented worldwide. Through ongoing research and evaluation, MEND evolves to suit the diverse needs of communities and participants. MEND is a multicomponent family-based program that addresses three main areas: 1) education, 2) skills training, and 3) motivational enhancement. During the intervention, families participate in sessions led by trained interventionists that focus on nutrition, behavior change, and physical activity. The MEND program is intended to empower children and adolescents to reach and maintain a healthy weight and to sustain long-term healthy lifestyle habits. In an evaluation of the MEND program, children reduced their waist circumference and z-BMI scores, as well as sustained the benefits of cardiovascular fitness, physical activity levels, and self-esteem.[29]

Website: http://mendcentral.org/



High Five for Kids

The High Five for Kids program was recently developed by the Harvard Medical School Department of Population Medicine and Harvard Vanguard Medical Associates. The program targets children between the ages 2 and 6 years old with high BMI for age and sex, and takes place in a primary care setting with trained staff and clinicians. High Five for Kids incorporates both the chronic care model and behavior change theory to assist both parents and children in modifying their behaviors to adopt healthier diets and increase physical activity. Motivational interviewing and goal-setting are utilized to help families reach their goals. The program also gives advice to families to help them reduce television viewing and consumption of sugary beverages and fast food. Overall, children participating in High Five for Kids demonstrated only slightly lower BMI (non-significant) compared to children in usual care after one year of follow-up; however, further analysis revealed that girls and lower-income children showed significant reductions in BMI. Children in the program also reduced their television viewing and intake of both fast food and sugary beverages.[30]

Website: http://www.populationmedicine.org/research/OPP/high-five-kids-toolkit

Bright Bodies & Smart Moves

Bright Bodies is a weight management program for children and adolescents developed by Yale University. The program is designed for overweight children and is particularly sensitive to the needs of minority youth living in an urban environment. Registered dietitians, exercise physiologists, and social workers trained in the Bright Bodies protocol are the primary interventionists. Bright Bodies is an intensive, family-based program which utilizes the Smart Moves™ workbook and features weekly sessions on nutrition and behavior modification. Additionally, participants attend bi-weekly physical activity sessions. Parent-focused sessions encourage parents/caregivers to modify their own behaviors and be role models of a healthy lifestyle, and parents/caregivers are encouraged to attend sessions with their children. A study of the effects of Bright Bodies showed that the program has beneficial effects on body composition and insulin resistance, as children who participated in the program decreased their weight, BMI, body fat, and insulin resistance.[31]

Websites: http://www.brightbodies.org/ and http://www.smartmovesforkids.com/

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