Childhood Obesity in Primary Care
Attendees: Prior to the start of the activity, please review the below information to ensure successful participation in this Enduring Activity

Accreditation and Designation Statements

• The American Academy of Pediatrics (AAP) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

• The AAP designates this enduring material for a maximum of 1.0 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

• This activity is acceptable for a maximum of 1.0 AAP credits. These credits can be applied toward the AAP CME/CPD Award available to Fellows and Candidate Members of the American Academy of Pediatrics.

• The American Academy of Physician Assistants (AAPA) accepts certificates of participation for educational activities certified for AMA PRA Category 1 Credit™ from organizations accredited by ACCME. Physician assistants may receive a maximum of 1.0 hours of Category 1 credit for completing this program.

• This program is accredited for 1.0 NAPNAP CE contact hours of which 0 contain pharmacology (Rx), (0 related to psychopharmacology) (0 related to controlled substances), content per the National Association of Pediatric Nurse Practitioners (NAPNAP) Continuing Education Guidelines.
Purpose of Course
The Childhood Obesity in Primary Care Modules are designed to provide evidence-based practice for obesity prevention and treatment and use of effective strategies with families. The modules also aim to create healthcare systems that better supports evidence-based practice, increasing the likelihood of effective and sustainable changes in practice. In addition, the modules also enhance collaboration of providers with other healthcare professional and with broader community initiatives.

Learning Objectives
Upon completion of this activity, participants will be able to:
- Improve the quality of physical, behavioral, and medical assessment, critical to obesity prevention and management, for children attending well child visits
- Understand the appropriate workup and co-management of the most common comorbidities associated with obesity
- Explain the strategies for stages 3 and 4 of obesity treatment
- Define the essential aspects of successful care coordination needed for patients with obesity (with emphasis on the role of the PCP)
Disclosure of Commercial Support for AAP CME Activities
The AAP gratefully acknowledges support for Childhood Obesity in Primary Care Module 4 in the form of educational support from Nestlé Nutrition.

Disclosure of Financial Relationships and Resolution of Conflicts of Interest for AAP CME Activities Grid
The AAP CME/CPD program develops, maintains, and improves the competence, skills, and professional performance of pediatricians and pediatric healthcare professionals by providing quality, relevant, accessible, and effective educational experiences that address gaps in professional practice. The AAP CME/CPD program strives to meet the educational needs of pediatricians and pediatric healthcare professionals and support their lifelong learning with a goal of improving care for children and families. (AAP CME/CPD Program Mission Statement, May 2015)

The AAP recognizes that there are a variety of financial relationships between individuals and commercial interests that require review to identify possible conflicts of interest in a CME activity. The “AAP Policy on Disclosure of Financial Relationships and Resolution of Conflicts of Interest for AAP CME Activities” is designed to ensure quality, objective, balanced, and scientifically rigorous AAP CME activities by identifying and resolving all potential conflicts of interest prior to the confirmation of service of those in a position to influence and/or control CME content. The AAP has taken steps to resolve any potential conflicts of interest.

All AAP CME activities will strictly adhere to the Accreditation Council for Continuing Medical Education (ACCME) Standards for Commercial Support: Standards to Ensure the Independence of CME Activities. In accordance with these Standards, the following decisions will be made free of the control of a commercial interest: identification of CME needs, determination of educational objectives, selection and presentation of content, selection of all persons and organizations that will be in a position to control the content, selection of educational methods, and evaluation of the CME activity.

The purpose of this policy is to ensure all potential conflicts of interest are identified and mechanisms to resolve them prior to the CME activity are implemented in ways that are consistent with the public good. The AAP is committed to providing learners with commercially unbiased CME activities.

Activity Title: Childhood Obesity in Primary Care Module 5: Management and Treatment of Co-Morbidities of Obesity
Activity Location: Online/Enduring Material
Activity Date: December 1, 2018- November 30, 2021

| Name                  | Role                  | Relevant Financial Relationship (Please indicate Yes or No) | Name of Commercial Interest(s)* (Please list name(s) of entity AND Nature of Relevant Financial Relationship(s)) | Disclosure of Off-Label (Unapproved)/Investigational Uses of Products
<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Jeannie Huang, MD, FAAP</td>
<td>Faculty</td>
<td>Yes</td>
<td>Faculty holds research grants with Janssen, Abbvie, Allergan. These grants do not relate to childhood obesity</td>
<td>Do not intend to discuss</td>
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<tr>
<td>Alison Baker</td>
<td>COI Reviewer/Resolver</td>
<td>No</td>
<td>None</td>
<td>Do not intend to discuss</td>
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<tr>
<td>Eileen Reilly, MSW</td>
<td>Staff/Disclosure Admin/Planning Committee</td>
<td>No</td>
<td>None</td>
<td>Do not intend to discuss</td>
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# Disclosure of Financial Relationships

All individuals in a position to influence and/or control the content of AAP CME activities are required to disclose to the AAP and subsequently to learners that the individual either has no relevant financial relationships or any financial relationships with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services discussed in CME activities. Listed below are the disclosures provided by individuals in a position to influence and/or control CME activity content.

*A commercial interest is defined as any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients.

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<th>Disclosure of Off-Label (Unapproved)/Investigational Uses of Products</th>
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<tr>
<td>Jeanne Lindros, MPH</td>
<td>Staff/Planning Committee</td>
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<td>None</td>
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<td>Do not intend to discuss</td>
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<tr>
<td>Janice Liebhart, MS</td>
<td>Staff/Planning Committee</td>
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<td>None</td>
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<td>Do not intend to discuss</td>
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<tr>
<td>Stephanie Womack, MA</td>
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<tr>
<td>Justine Marshman</td>
<td>Staff/Planning Committee</td>
<td>No</td>
<td>None</td>
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<td>Do not intend to discuss</td>
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</table>
AAP gratefully acknowledges support for its Childhood Obesity in Primary Care Modules in the form of an educational grant provided by Nestlé.

Product-Specific Advertising / Links to Product Websites
No product-specific advertising of any type appears in this activity. No links to product websites appear in this activity.

List of Principal Faculty and Credentials
• Jeannie Huang, MD, MPH, FAAP

Method of Participation
Participants will participate in the module online. Upon completion of the webinar, participants will complete an assessment in order to receive CME credit.

Minimum Performance Level
Per the 2010 revision of the American Medical Association (AMA) Physician’s Recognition Award (PRA) and credit system, a minimum performance level must be established on enduring material and journal-based CME activities that are certified for AMA PRA Category 1 Credit™. In order to successfully complete this Ambulance Safety for the 21st Century Webinar CME activity for AMA PRA Category 1 Credit™, learners must demonstrate a minimum performance level of 70% or higher on the post-activity assessment, which measures achievement of the educational purpose and objectives of the activity.
Medium or Combination of Media Used
Enduring Material

List of hardware/software requirements
Our Technical Support team would like to ensure that you have a great experience with our streaming media services. Due to variations in PC and network security configurations, we recommend that you test the ability to receive streaming media before the day of this event on the computer you will be using to view the event. To do this, click the "Test Your Computer Now" button below. You will hear a short announcement and see slide information.

If you are unable to open and play the presentation, the test has failed. In this case, you may either need to try another computer or consult with your network administrator to obtain privileges required to view streaming media. This process could take some time, so please conduct this test as soon as possible.

System requirements
The system requirements for viewing a streaming media event are:
Windows
• Windows XP, Windows 2003 or Windows Vista
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• Microsoft Internet Explorer 6.0 SP1 or later, Firefox 2.0 or later, or Google Chrome 1.0
• For Firefox and Chrome, Silverlight 1.0 or later
• Windows Media Player 9.0 or later
• Broadband Internet connection (256 Kbps & above)
• No network blocks or filters that disable streaming media
Mac
• Mac OS X 10.4.8 or later
• Safari 2.0.4 or later (or Firefox 2.0 or later)
• Silverlight 1.0
• Broadband Internet connection (256 Kbps & above)
• No network blocks or filters that disable streaming media

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If you need further assistance, please call KRM Customer Service Monday–Friday at 800.775.7654 or 715.833.5426 between 7:00 am and 5:00 pm CT, or email us at support@krm.com.

Provider Contact Information
If you have questions about this course or encounter technical problems, please contact Nikki Berry at nberry@aap.org

Privacy and Confidentiality Statement
Childhood Obesity in Primary Care
Management and Treatment of Comorbidities of Obesity

Jeannie Huang, MD, MPH, FAAP
Professor, Department of Pediatrics
University of California, San Diego
About Dr Huang

- Professor in Pediatrics
- University of California San Diego
- Involved in Pediatric Obesity Prevention efforts over the past decade
- Practicing pediatric gastroenterologist over the past 16 years
Learning Objectives

- Understand the appropriate workup and co-management of the most common comorbidities associated with obesity
- Explain the strategies for Stage 3 and Stage 4 of obesity management
- Define the essential aspects of successful core coordination needed for patients with obesity (with emphasis on the role of the PCP)
Algorithm for the Assessment and Management of Childhood Obesity in Patients 2 Years and Older

This algorithm is based on the 2007 Expert Committee Recommendations, new evidence and promising practices.

Assess Behaviors
Assess healthy eating and active living behaviors

Provide Prevention Counseling
- 5 (fruits & vegetables) 2 (hours or less of screen time) 1 (hour or more of physical activity) 0 (sugary drinks) every day!

Determine Weight Classification
- Accurately determine weight and height, calculate and plot Body Mass Index (BMI) and determine BMI percentile.

Healthy Weight (BMI 5-85th)
- Family History
- Review of Systems
- Physical Exam

Overweight (BMI 85-95th)
- Family History
- Review of Systems
- Physical Exam

Obesity (BMI >95th)
- Family History
- Review of Systems
- Physical Exam

Risk Factors Absent

Risk Factors Present

Routine Care
- Provide ongoing positive reinforcement for healthy behaviors.
- For patients in the healthy weight category, screen for genetic dyslipidemia by obtaining a non-fasting lipid profile for all children between the ages of 9-11 and again between 12-13.
- For patients in the overweight category, obtain a lipid profile.
- Maintain weight vector: Crossing 2 percentile lines is a risk for obesity
- Reasses annually
- Follow up at every well-child visit.

Lab Screening
- The 2007 Expert Committee Recommendations state that a fasting glucose and fasting lipid profile along with ALT and AST should be obtained.
- Additionally, guidelines from the ADA and Endocrine Society recommend using A1C, fasting glucose or oral glucose tolerance test for diabetes or prediabetes.
- For patient convenience, some providers are obtaining non-fasting labs.
- Clinical judgment, local preferences and availability of testing should be used to help determine the timing of follow up of abnormal labs.
- Of note, some subspecialty clinics are screening for Vitamin D deficiency and insulin resistance by obtaining labs for Vitamin D and fasting insulin. The clinical utility and cost-effectiveness of such testing is yet to be determined.
- Currently, there are no guidelines on when to start laboratory testing for patients with obesity. Based upon the patient’s health risk, some experts may start screening patients at 2 years of age.

Obesity-related conditions: The following conditions are associated with obesity and should be considered for further work-up. Additional lab tests may be warranted if indicted by the patient’s clinical condition. In 2014, consensus statements from The Children’s Hospital Association described the management of a number of these conditions.

Dermatologic:
- Acanthosis nigricans
- Hirsutism
- Intertrigo

Endocrine:
- Polycystic ovarian syndrome (PCOS)
- Precocious puberty
- Prediabetes: impaired fasting glucose and/or impaired glucose tolerance as demonstrated during a GTT
- Premature adrenarche
- Type 2 Diabetes

Gastrointestinal:
- Cholelithiasis
- Constipation
- GERD
- Non-alcoholic fatty liver disease or steatohepatitis

Neuropathy:
- Pseudotumor cerebri

Orthopedic:
- Blount’s Disease
- Slipped capital femoral epiphysis (SCFE)

Psychological/Behavioral Health:
- Anxiety
- Binge eating disorder
- Depression
- Trimming/bullying

Intervention
- Management of Childhood Obesity
- Multi-disciplinary Team
- Interventions

Intensive care for patients overweight or obesity
- Start with gradual stage advancement through the stages based upon the response to risks and motivation.
- Counseling style, such as motivational interviewing, should be employed to support weight loss.
- Obesity should not lose more than 1 pound/month; older children and adolescents with an average of 2 pounds/month.

Risk Factors Present

Rice/Primary Care Provider
- Visits (15-20 min) focusing on behaviors that resonate with the patient, family and provider.
- Social worker, athletic trainer or physical therapist for added support and counseling.
- Gradual change in BMI. Weight maintenance or a decrease in BMI velocity.
- Family many recommend at least monthly follow-up visits. After 3-6 months and if not improving consider advancing to Stage 2.

Light Management
- Rice/Primary Care Provider with appropriate training.
- While including only intensive support and structure to achieve healthy behavior change.
- Weight maintenance or a decrease in BMI velocity.
- Terminated by the patient, family, and physician. After 3-6 months, if the BMI/weight status has improved.

Nutrition Counseling
- Management of Childhood Obesity
- Multi-disciplinary Team
- Interventions

Intensive care for patients overweight or obesity
- Start with gradual stage advancement through the stages based upon the response to risks and motivation.
- Counseling style, such as motivational interviewing, should be employed to support weight loss.
- Obesity should not lose more than 1 pound/month; older children and adolescents with an average of 2 pounds/month.

Risk Factors Absent

Rice/Primary Care Provider
- Visits (15-20 min) focusing on behaviors that resonate with the patient, family and provider.
- Social worker, athletic trainer or physical therapist for added support and counseling.
- Gradual change in BMI. Weight maintenance or a decrease in BMI velocity.
- Family many recommend at least monthly follow-up visits. After 3-6 months and if not improving consider advancing to Stage 2.

Light Management
- Rice/Primary Care Provider with appropriate training.
- While including only intensive support and structure to achieve healthy behavior change.
- Weight maintenance or a decrease in BMI velocity.
- Terminated by the patient, family, and physician. After 3-6 months, if the BMI/weight status has improved.

Nutrition Counseling
Algorithm for the Assessment and Management of Childhood Obesity in Patients 2 Years and Older

This algorithm is based on the 2007 Expert Committee Recommendations, new evidence and promising practices.

Assess Behaviors
Assess healthy eating and active living behaviors.

Provide Prevention Counseling
5 (fruits & vegetables) 2 (hours of less of screen time) 1 (hour or more of physical activity) 0 (sugary drinks) every day!

Determine Weight Classification
Accurately determine weight and height, calculate and plot Body Mass Index (BMI) and determine BMI percentile.

Healthy Weight
(BMI ≤ 85th)
- Family History
- Review of Systems
- Physical Exam

Overweight
(BMI 85-95th)
- Augmented (obesity-specific)
  - Family History
  - Review of Systems
  - Physical Exam

Obesity
(BMI ≥ 95th)
- Augmented (obesity-specific)
  - Family History
  - Review of Systems
  - Physical Exam

Risk Factor Absent

Risk Factors Present

Routine Care
- Provide ongoing positive reinforcement for healthy behaviors.
- For patients in the healthy weight category, screen for genetic dyslipidemia by obtaining a non-fasting lip profile for all children between the ages of 9-11 and again between 15-17.
- For patients in the overweight category, obtain a lip profile.
- Maintain weight velocity:
  - Crossing 2 percentile lines is a risk for obesity
  - Reassess periodically
  - Follow up at every well-child visit.

Lab Screening
- The 2007 Expert Committee Recommendations state that a fasting glucose and fasting lipid profile along with ALT and AST should be obtained.
- Additionally, guidelines from the AHA and Endocrine Society recommend using A1C, fasting glucose or oral glucose tolerance test to test for diabetes or pre-diabetes.
- For patient convenience, some providers are obtaining non-fasting labs.
- Clinical judgment, local preferences and availability of testing should be used to help determine the timing of follow up of abnormal lab.
- Off note, some sub-specialists are screening for Vitamin D deficiency and insulin resistance by obtaining labs for Vitamin D and fasting insulin. The clinical utility and cost effectiveness of such testing is yet to be determined.
- The algorithm is designed for cases where to start laboratory testing for patients with obesity. Based upon the patient's history, health experts may start screening patients at 2 years of age.

Obesity-related conditions: The following conditions are associated with obesity and should be considered for further work-up. Additional lab tests may be warranted if indicated by the patient's clinical conditions. In 2014, consensus statements from the Children's Hospital Association described the management of a number of these conditions.

Dermatologic
- Acneiform eruptions
- Hirsutism
- Insulinoma

Endocrine
- Polycystic ovarian syndrome (PCOS)
- Precocious puberty
- Prediabetes: impaired fasting glucose and/or impaired glucose tolerance as demonstrated during an OGTT
- Premature adrenarche
- Type 2 Diabetes

Gastrointestinal
- Cholelithiasis
- Constipation
- GERD
- Nonalcoholic fatty liver disease or steatohepatitis

Neuromuscular
- Pseudotumor cerebri

Orthopedic
- Blount's Disease
- Scoliosis
- Cerebral palsy
- Epilepsy
- Seizures

Psychological/Behavioral Health
- Anxiety
- Binge eating disorder
- Depression
- Osteoarthritis
- Kyphosis

*Based on history, physical exam, review of systems, and physical exams, in addition to weight classification.*
Management and Treatment Stages for Patients with Overweight or Obesity

- Patients should start at the least intensive stage and advance through the stages based upon the response to treatment, age, BMI, health risks and motivation.
- An empathetic and empowering counselling style, such as motivational interviewing, should be employed to support patient and family behavior change.  
- Children age 2 – 5 who have obesity should not lose more than 1 pound/month; older children and adolescents with obesity should not lose more than an average of 2 pounds/week.

Stage 1 Prevention Plus

Where/By Whom: Primary Care Office/Primary Care Provider

What: Planned follow-up themed visits (15-20 min) focusing on behaviors that resonate with the patient, family and provider. Consider partnering with dietitian, social worker, athletic trainer or physical therapist for added support and counseling.

Goals: Positive behavior change regardless of change in BMI. Weight maintenance or a decrease in BMI velocity.

Follow-up: Tailor to the patient and family motivation. Many experts recommend at least monthly follow-up visits. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 2.

Stage 2 Structured Weight Management

Where/By Whom: Primary Care Office/Primary Care Provider with appropriate training

What: Same intervention as Stage 1 while including more intense support and structure to achieve healthy behavior change.

Goals: Positive behavior change. Weight maintenance or a decrease in BMI velocity.

Follow-up: Every 2 – 4 weeks as determined by the patient, family and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 3.

Stage 3 Comprehensive Multi-disciplinary Intervention

Where/By Whom: Pediatric Weight Management Clinic/Multi-disciplinary Team

What: Increased intensity of behavior changes, frequency of visits, and specialists involved. Structured behavioral modification program, including food and activity monitoring, and development of short-term diet and physical activity goals.

Goals: Positive behavior change. Weight maintenance or a decrease in BMI velocity.

Follow-up: Weekly or at least every 2 – 4 weeks as determined by the patient, family, and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 4.

Stage 4 Tertiary Care Intervention

Where/By Whom: Pediatric Weight Management Center/Providers with expertise in treating childhood obesity

What: Recommended for children with BMI > 95% and significant comorbidities if unsuccessful with Stages 1 – 3. Also recommended for children > 99% who have shown no improvement under Stage 3. Intensive diet and activity counseling with consideration of the use of medications and surgery.

Goals: Positive behavior change. Decrease in BMI.

Follow-up: Determine based upon patient’s motivation and medical status.

References

Updated 08/19/15
Comorbidities

- Comorbidities associated with obesity essentially affect all portions of the body
- The risk of any comorbidity with obesity varies by age, SES, and racioethnic status
- A number of comorbidities present with symptoms
- Several major comorbidities are asymptomatic and require laboratory screening for early identification and treatment
### Common Co-morbidities

**Obesity-related conditions:** The following conditions are associated with obesity and should be considered for further work-up. Additional lab tests may be warranted if indicted by the patient’s clinical condition. In 2014, a consensus statement from The Children’s Hospital Association described the management of a number of these conditions⁶.

<table>
<thead>
<tr>
<th>Category</th>
<th>Conditions</th>
</tr>
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</table>
| **Cardiovascular:** | • Dyslipidemia  
• Hypertension  
| **Endocrine:**     | • Polycystic ovarian syndrome (PCOS)  
• Precocious puberty  
• Premature adrenarche  
• Type 2 Diabetes  |
| **Gastrointestinal:** | • Cholelithiasis  
• Constipation  
• GERD  
• Nonalcoholic fatty liver disease/Nonalcoholic steatohepatitis  |
| **Psychological/Behavioral Health:** | • Anxiety  
• Binge eating disorder  
• Depression  
• Teasing/bullying  |
| **Neurological:**  | • Pseudotumor cerebri  |
| **Orthopedic:**    | • Blount’s Disease  
• Slipped capital femoral epiphysis (SCFE)  |
| **Pulmonary:**     | • Asthma  
• Sleep Apnea  |
| **Skin:**          | • Acanthosis nigricans  
• Hirsutism  
• Intertrigo  |
## Hypertension

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<th>Hypertension</th>
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<tr>
<td><strong>History</strong></td>
<td>Family history of hypertension or other obesity-related comorbidity</td>
</tr>
<tr>
<td><strong>Review of systems</strong></td>
<td>Usually asymptomatic</td>
</tr>
<tr>
<td><strong>Physical examination</strong></td>
<td>Elevated systolic and/or diastolic blood pressure</td>
</tr>
<tr>
<td><strong>Laboratory/imaging</strong></td>
<td>Evaluation for other causes of hypertension as indicated</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Referral to pediatric hypertension specialist, dietary treatment, pharmacologic treatment; Weight reduction is the primary therapy for obesity-related hypertension</td>
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### Hypertension: New Guidelines

#### Updated Definitions of BP Categories and Stages

<table>
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<tr>
<th>For Children Aged 1–13 y</th>
<th>For Children Aged ≥13 y</th>
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</thead>
<tbody>
<tr>
<td>Normal BP: &lt;90th percentile</td>
<td>Normal BP: &lt;120/&lt;80 mm Hg</td>
</tr>
<tr>
<td>Elevated BP: ≥90th percentile to &lt;95th percentile or 120/80 mm Hg to &lt;95th percentile (whichever is lower)</td>
<td>Elevated BP: 120/&lt;80 to 129/&lt;80 mm Hg</td>
</tr>
<tr>
<td>Stage 1 HTN: ≥95th percentile to &lt;95th percentile + 12 mmHg, or 130/80 to 139/89 mm Hg (whichever is lower)</td>
<td>Stage 1 HTN: 130/80 to 139/89 mm Hg</td>
</tr>
<tr>
<td>Stage 2 HTN: ≥95th percentile + 12 mm Hg, or ≥140/90 mm Hg (whichever is lower)</td>
<td>Stage 2 HTN: ≥140/90 mm Hg</td>
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# Type 2 Diabetes

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<tr>
<td><strong>Physical examination</strong></td>
</tr>
<tr>
<td><strong>Laboratory/imaging</strong></td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
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</tbody>
</table>
Type 2 Diabetes Optimal Treatment

- TODAY Trial
  - 699 youth 10-17 years
  - Three arms
    - Metformin
    - Metformin + rosiglitazone
    - Metformin + lifestyle changes
  - Only half achieve normoglycemia
  - Metformin + rosiglitazone demonstrated significantly less glycemic failure (hemoglobin A1c >=8%) than metformin alone suggesting that adding a second oral medication early in youth onset T2D may help promote durable glycemic control. However this group also demonstrated an increase in BMI over the other groups.

- Health disparities
  - High non-adherence rates particularly in adolescents with T2D
<table>
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<tbody>
<tr>
<td><strong>History</strong></td>
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<td><strong>Review of systems</strong></td>
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<tr>
<td><strong>Physical examination</strong></td>
</tr>
<tr>
<td><strong>Laboratory/imaging</strong></td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
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## Dyslipidemia

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<tr>
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<th>Acceptable (mg/dL)</th>
<th>Borderline (mg/dL)</th>
<th>High (mg/dL)</th>
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<tr>
<td>Total Cholesterol</td>
<td>&lt;170</td>
<td>179-199</td>
<td>&gt;=200</td>
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<tr>
<td>LDL-C</td>
<td>&lt;110</td>
<td>110-129</td>
<td>&gt;=130</td>
</tr>
<tr>
<td>Non-HDL-C</td>
<td>&lt;120</td>
<td>120-144</td>
<td>&gt;=145</td>
</tr>
<tr>
<td>Triglycerides (y)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>&lt;75</td>
<td>75-99</td>
<td>&gt;=100</td>
</tr>
<tr>
<td>10-19</td>
<td>&lt;90</td>
<td>90-129</td>
<td>&gt;=130</td>
</tr>
<tr>
<td>HDL-C</td>
<td>&gt;45</td>
<td>40-45</td>
<td>&lt;40</td>
</tr>
</tbody>
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- Atherosclerosis begins in childhood
- Fasting v. Nonfasting lipid panel screening
- Treatment
  - 1st – Lifestyle and Diet modification
  - 2nd – Medications (Statins/Bile acid sequestrants)
### Nonalcoholic Steatohepatitis

<table>
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<tr>
<th>History</th>
<th>No specific history; some cases have other family members affected</th>
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<tbody>
<tr>
<td>Review of systems</td>
<td>Possible nausea and upper right quadrant discomfort</td>
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<tr>
<td>Physical examination</td>
<td>Hepatomegaly</td>
</tr>
<tr>
<td>Laboratory/imaging</td>
<td>Elevated serum aminotransferases, echogenicity of liver on ultrasound</td>
</tr>
<tr>
<td>Treatment</td>
<td>Referral to pediatric gastroenterologist for evaluation and definitive diagnosis, weight loss</td>
</tr>
<tr>
<td>GERD</td>
<td><strong>History</strong></td>
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<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
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<tr>
<td></td>
<td>Commonly chest/upper abdominal pain – further questioning reveals heartburn, backwash or sour acid taste in mouth, increased symptoms at night when lying down</td>
</tr>
<tr>
<td>Review of Systems</td>
<td>Can be associated with sleep problems, chronic cough, weight loss, early satiety, dysphagia if severe (suggests needs referral)</td>
</tr>
<tr>
<td>Physical examination</td>
<td>Nonspecific – can come with epigastric tenderness</td>
</tr>
<tr>
<td>Laboratory/imaging</td>
<td>Nonspecific</td>
</tr>
<tr>
<td>Treatment</td>
<td>Antacid therapy, weight loss</td>
</tr>
</tbody>
</table>
## Functional Constipation

<table>
<thead>
<tr>
<th>Functional Constipation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>History</strong></td>
</tr>
<tr>
<td>Commonly vague abdominal pain – although can be sharp at times when cramping against hard stool</td>
</tr>
<tr>
<td><strong>Review of systems</strong></td>
</tr>
<tr>
<td>Ask about stool soiling; Can be associated with urinary tract infections, early satiety, weight loss and/or vomiting if severe</td>
</tr>
<tr>
<td><strong>Physical exam</strong></td>
</tr>
<tr>
<td>Nonspecific – but can find large stool mass particularly at LLQ</td>
</tr>
<tr>
<td><strong>Laboratory/imaging</strong></td>
</tr>
<tr>
<td>Nonspecific. KUB’s often used to diagnose but not recommended</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
</tr>
<tr>
<td>Dietary options, PEG therapies</td>
</tr>
</tbody>
</table>
Cholelithiasis

- Cholesterol gallstones occurs 3-6 times as often in morbidly obese persons as compared to controls
- Occurs owing to increased hepatic secretion of cholesterol
- Weight loss increases the risk of gallstones in the obese
## Obstructive Sleep Apnea (OSAS)

<table>
<thead>
<tr>
<th>Sleep Apnea</th>
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</thead>
<tbody>
<tr>
<td><strong>History</strong></td>
</tr>
<tr>
<td><strong>Review of systems</strong></td>
</tr>
<tr>
<td><strong>Physical examination</strong></td>
</tr>
<tr>
<td><strong>Laboratory/imaging</strong></td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
</tr>
</tbody>
</table>
## Slipped Capital Femoral Epiphysis (SCFE)

<table>
<thead>
<tr>
<th>Slipped Capital Femoral Epiphysis</th>
<th>Knee or hip pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>Knee or hip pain, limp</td>
</tr>
<tr>
<td>Review of systems</td>
<td>Limp, pain in knee or hip</td>
</tr>
<tr>
<td>Physical examination</td>
<td>Hip and knee films</td>
</tr>
<tr>
<td>Laboratory/imaging</td>
<td>Immediate referral to pediatric orthopedist</td>
</tr>
</tbody>
</table>
## Blount Disease

<table>
<thead>
<tr>
<th>Blount Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
</tr>
<tr>
<td>Bowing</td>
</tr>
<tr>
<td>Review of systems</td>
</tr>
<tr>
<td>Bowing (tibia vera), knee pain, limp</td>
</tr>
<tr>
<td>Physical examination</td>
</tr>
<tr>
<td>Bowing, knee pain, limp</td>
</tr>
<tr>
<td>Laboratory/imaging</td>
</tr>
<tr>
<td>Knee films</td>
</tr>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>Referral to pediatric orthopedist</td>
</tr>
</tbody>
</table>
## Depression

<table>
<thead>
<tr>
<th>Depression</th>
<th>Family history of depression, history of abuse, psychological trauma, teasing, low self-esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>Loss of interest, anger, irritability, sadness, suicidal ideation</td>
</tr>
<tr>
<td>Review of systems</td>
<td>No signs; may have sad, irritable appearance with lack of self-care</td>
</tr>
<tr>
<td>Physical examination</td>
<td>None</td>
</tr>
<tr>
<td>Laboratory/imaging</td>
<td>None</td>
</tr>
<tr>
<td>Treatment</td>
<td>Mental health referral for counseling or pharmacologic treatment</td>
</tr>
</tbody>
</table>
Asthma

- Cross sectional studies have demonstrated relationship between:
  - Obesity and wheezing (OR 1.67 (1.25-2.21))
  - Overweight and obesity with airway obstruction
  - Obesity and poorly controlled asthma (OR 1.44 (1.05-1.99))
  - Obesity and longer length of stay for pediatric asthma hospitalizations

- Mechanisms
Treatment of Obesity
Review of Stages for Treatment

**Stage 1:** Prevention Plus

**Stage 2:** Structured Weight Management

**Stage 3:** Comprehensive Multi-disciplinary Intervention

**Stage 4:** Tertiary Care Intervention
Stage 1 Prevention Plus

Where/By Whom: Primary Care Office/Primary Care Provider

What: Planned follow-up themed visits (15-20 min) focusing on behaviors that resonate with the patient, family and provider. Consider partnering with dietician, social worker, athletic trainer or physical therapist for added support and counseling.

Goals: Positive behavior change regardless of change in BMI. Weight maintenance or a decrease in BMI velocity.\(^4\)

Follow-up: Tailor to the patient and family motivation. Many experts recommend at least monthly follow-up visits. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 2.

---

References
   Accessed October 9, 2013.
8. Preventing weight bias helping without harming in clinical practice. Pub Center for Health Policy and Obesity website. 
**Stage 2 Structured Weight Management**

**Where/By Whom:** Primary Care Office/Primary Care Provider with appropriate training

**What:** Same intervention as Stage 1 while including more intense support and structure to achieve healthy behavior change.

**Goals:** Positive behavior change. Weight maintenance or a decrease in BMI velocity.

**Follow-up:** Every 2 - 4 weeks as determined by the patient, family and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 3.
Stage 3 Comprehensive Multi-disciplinary Intervention

Where/By Whom: Pediatric Weight Management Clinic/Multi-disciplinary Team

What: Increased intensity of behavior changes, frequency of visits, and specialists involved. Structured behavioral modification program, including food and activity monitoring, and development of short-term diet and physical activity goals.

Goals: Positive behavior change. Weight maintenance or a decrease in BMI velocity.

Follow-up: Weekly or at least every 2 – 4 weeks as determined by the patient, family, and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 4.

References:
Stage 4 Tertiary Care Intervention

Where/By Whom: Pediatric Weight Management Center/Providers with expertise in treating childhood obesity

What: Recommended for children with BMI ≥ 95% and significant comorbidities if unsuccessful with Stages 1 - 3. Also recommended for children > 99% who have shown no improvement under Stage 3. Intensive diet and activity counseling with consideration of the use of medications and surgery.

Goals: Positive behavior change. Decrease in BMI.

Follow-up: Determine based upon patient's motivation and medical status.

References:
Role of the Pediatrician

- Role of the pediatrician at Stage 3 and Stage 4 very important
- PCP has the long-standing relationship with the child and family
- Care coordinator
- Open communications with the tertiary care team regarding social/compliance issues
Considerations

- Have a contact at the weight management center
- Anticipate family reluctance in transferring care
- Continue to be a resource to the family
- Don’t sign off; understand there may need to be a period of transition
Case Study
Julie is a 10 year old girl with obesity here for her 2 week weight management checkup
Julie’s PCP (your office mate) has been working with Julie’s weight issues for the past 5-6 months (she moved in from out of town)
You have been using the structured weight management (Stage 2) for the past 3 months
Despite detailed instructions to the family for increased support and structure to help Julie manage her eating and physical activity habits, her weight continues to climb.

The mother’s BMI is in normal range and she is frustrated.

You decide more intensive approach is necessary and move to Comprehensive Multi-disciplinary Intervention (Stage 3).
Growth Chart
At exam you noticed the following on Julie’s neck.
You recognize acanthosis nigricans and send blood screens including:

- A fasting lipid panel
- Liver function tests (ALT)
- A fasting glucose

You also notice another finding when you perform her exam.
You recognize signs of Blount disease
You make a referral to the orthopedic surgeon and order Vitamin D level

Labs
- Fasting glucose = 130 mg/dL
- LDL-C = 200 mg/dL
- ALT = 50 U/L
- 25-hydroxy Vitamin D = 15 ng/mL
CASE STUDY

- You are concerned about diabetes and make an urgent referral to the Diabetes clinic.
- You also refer Julie to the Gastroenterology clinic for her likely fatty liver disease.
- You refer Julie to the dietician to initiate the CHILD1 diet for her hypercholesterolemia.
- You initiate Vitamin D therapy.
- Finally, you refer Julie to your local hospital’s recently established Weight Management Clinic.
CASE STUDY

- It’s been a month and Julie has been following up with the Weight Management Clinic at your local hospital.
- You have been receiving results of your prior consultations, which Julie and her mother have been diligent in attending.
- Julie is seeing you now for an acute complaint now of a runny nose and sore throat.
At the visit, Julie’s weight is noticeably down which is the first time this has ever happened.

She has lost 5 lbs since you saw her which is well within the limits of recommendations (between 1-2 lbs/week).

Julie has been started on metformin by the Diabetes clinic and she is being followed by GI for her liver issues and she has been compliant on the CHILD1 diet.

Her orthopedic surgery is scheduled in the upcoming month or two.
You congratulate Julie, but notice she is not happy
Frankly, neither is her mother
They complain to you about her care
While they are happy with Julie’s progress, they are completely overwhelmed by the consultations and visits
Julie has been missing a lot of school for her care and is falling behind
- You sense that Julie is at high risk for non-compliance or loss to follow-up
- You call the Weight Management Clinic and discuss this with the clinic.
- They do have intermittent subspecialty coverage on certain days at the clinic.
- Julie can actually follow-up with multiple services at the same time and reduce her school absences
Julie is now here at your clinic for some abdominal pain 3 months later.
She has been doing well in regards to her comorbidity concerns (blood glucose in normal range, lipid panel normal, ALT =22 U/L) and got her osteotomy without complications.
Her weight loss has been great and on your weight measurement she is down an additional 30 lbs since you last saw her.
CASE STUDY

- On history her pain is localized to the RUQ and back and intermittent
- She is not and denies jaundice
- She denies fever and her temperature is normal
- She exhibits some pain to palpation at the RUQ
- You order an ultrasound
Julie has cholelithiasis
You refer her to the surgeon and notify the Weight Management Clinic
Together with her WMC specialists you are able to determine that while Julie’s weight loss has been slightly more than recommended 2-2.5 lb/week –
Actually she had not lost for a while and she had dropped 4 lbs/week over the past 2-3 weeks.
Further evaluation with the dietician demonstrates that Julie has been skipping meals and engaging in binge exercising.

With your input, the team is able to get Julie onto a more healthy weight loss regimen with close follow-up.
Julie is at follow up with you now getting ready for another year of school.
She has lost notable weight within stipulated guidelines.
Her BMI is actually now between 85-95% and she is hoping to hit below 85% in the next 4 months.
Your care coordination with the WMC has been a success!
The PCP has a very important role in the Staged Management of Obesity even when the primary weight management is occurring off site.

Comorbidity management requires both subspecialty and primary care pediatrician input.

Open communications between team members is key.
Thank you!