DISCLAIMER
Adherence to this clinical recommendation is voluntary. The recommendations provided should not be considered inclusive of all proper methods of care or exclusive of other methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding the propriety of any specific procedures must be made by the physician in light of the individual circumstances presented by the patient.

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I. SCREENING

- A Body Mass Index (BMI) percentile measurement is recommended for children aged 2 to 18 at least annually per calendar year.
- BMI is calculated by measuring height and weight, plotted using age- and gender-specific BMI percentile charts

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Underweight&quot;</td>
<td>BMI less than 5th percentile</td>
</tr>
<tr>
<td>&quot;Healthy&quot;</td>
<td>BMI between 5th to 84th percentile</td>
</tr>
<tr>
<td>&quot;Overweight&quot;</td>
<td>BMI between 85th and 94th percentile</td>
</tr>
<tr>
<td>&quot;Obese&quot;</td>
<td>BMI at or above 95th percentile</td>
</tr>
</tbody>
</table>

II. EVALUATION

For children and adolescents classified as overweight or obese (at or above the 85th percentile), evaluation for weight-related comorbidities is recommended.

A. HISTORY AND PHYSICAL ASSESSMENT

1. A thorough history and physical exam are recommended to assess the following:
   - Blood pressure
   - Orthopedic abnormalities
   - Abnormal skin findings (e.g. acanthosis nigricans, hirsutism, striae)
   - Menstrual history and pubertal development (i.e. Tanner stage)
   - Psychosocial problems (e.g. depression, anxiety)
   - Disruptive sleep or snoring
   - Genetic syndromes (use appropriate growth chart)

2. Important family history risk factors to consider:
   - Overweight or obesity
   - Type 2 diabetes, Maternal gestational diabetes
   - Dyslipidemia
   - Hypertension
   - Premature cardiovascular disease (first-degree male relative <55 years or female <65 years)
   - Smoking

3. Ask parents and children about behavioral and psychosocial risk factors, including dietary patterns, exercise habits, and social and sedentary activities (e.g., TV, video games) Document activity in the exercise vital sign navigator KP HeathConnect.

B. LABORATORY TESTS (age 6 and older, refer to Table 1: Guideline for Laboratory Screening and Recommended Action)

1. The following lab tests are recommended:
   - For 85th-94th percentile and no family history
     - Fasting lipid profile preferred or non-fasting LDL direct, HDL/Total Cholesterol ratio
   - For greater than or equal to 85th with risk factors (hypertension, acanthosis etc) or + family history= (among first- and second-degree relatives obesity, T2DM, and early cardiovascular disease) or 95th percentile or greater
- Fasting lipid profile preferred or non-fasting LDL direct, HDL/Total Cholesterol ratio
  HbA1c, fasting blood glucose or random blood glucose
- ALT
- See table below for interpretation and actions associated with abnormal or elevated test results.

**TABLE 1**: Guideline for Laboratory Screening Results and Recommended Action

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cholesterol</strong></td>
<td>Borderline: TC &gt;170-199 mg/dL, LDL-C 110-129 mg/dL</td>
<td>Discuss risk factor reduction. Repeat in 12 months. Provide nutrition resource handouts. See attachment.</td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>High: TC &gt;200mg/dL, LDL-C &gt;130 mg/dL</td>
<td>Complete a cardiovascular risk assessment. Recommend screening for all family members. If diabetic consider drug therapy. Refer to dietitian. Repeat cholesterol in 6 months Rule out familial and secondary disorders, recommend low cholesterol diet. Provide nutrition resource handouts. See education resources and PCMH attachments.</td>
</tr>
<tr>
<td><strong>Diabetes Screening</strong></td>
<td>FBS 100-125mg/dl OR HbA1c 5.7%-6.4%</td>
<td>Pre-Diabetes Diagnosis. Provide nutrition Resources handouts. See education resources,T2DM, and PCMH attachments. Follow up with HbA1C and/or FBS in 3-12 mos. CC note to dietitian pool “P Dietary Oahu’, ‘P Dietary Maui’ or ‘P Dietary Big Island’</td>
</tr>
<tr>
<td><strong>Diabetes Screening</strong></td>
<td>FBS≥126 mg/dl OR HbA1c 6.5% or greater</td>
<td>Diabetes Diagnosis Follow Diabetes protocol. Repeat FBS and/or HbA1C to confirm diagnosis. Referral to pediatric endocrinologist based on diagnosis confirmation. Initiate treatment with metformin and/or insulin. Begin blood glucose monitoring. (PNLM diabetes supplies) Provide Nutrition Resource handouts. See education resources, T2DM and PCMH attachments. Diabetes Basics session for parents.</td>
</tr>
<tr>
<td><strong>ALT</strong></td>
<td>Greater than Twice normal range</td>
<td>Repeat in 3 mos. If ALT still twice normal range, consider ultrasound. Rule out other etiologies. If at anytime the patient presents with clinical symptoms of liver disease, consider referral to pediatric gastroenterologist. Provide nutrition resource handouts. See education resources and PCMH attachments.</td>
</tr>
</tbody>
</table>
2. The following additional tests are options for obese children and adolescents presenting with any of the following:
   - Suspected hypothyroidism: TSH
   - Menstrual irregularity: Pediatric Testosterone, Sex Hormone Binding Globulin, prolactin, and TSH, cortisol
   - Sleep study for suspected obstructed sleep apnea

<table>
<thead>
<tr>
<th>TSH</th>
<th>&gt;4.5, but &lt;10</th>
<th>Repeat TSH; add free T4 and anti-TPO antibody when patient is well. If TSH remains elevated or if &gt;10, refer to pediatric endocrinologist.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testosterone/SHBG</td>
<td>Elevated</td>
<td>Consider referral to pediatric endocrinology.</td>
</tr>
<tr>
<td>Prolactin</td>
<td>Elevated</td>
<td>Refer to pediatric endocrinology.</td>
</tr>
</tbody>
</table>

III. WEIGHT MANAGEMENT

A. HEALTHY WEIGHT FOR HEIGHT AND AGE
1. For children and adolescents whose weight is normal for height and age (5th to 84th percentile), maintenance of BMI percentile is recommended.

B. OVERWEIGHT AND OBESE
1. Ages 2-5 Years
   - Overweight (85th-94th percentile) with no risks — maintain weight velocity
   - Overweight (85th-94th percentile) with risks — decrease weight velocity or weight maintenance
   - Obese (≥ 95th-98th percentile) — weight maintenance until BMI is within healthy range
   - BMI ≥ 99th percentile - Gradual weight loss of up to 1 pound per month if BMI is very high
   - *Initiate weight plan based on readiness for change and educate.* See education resources and PCMH attachments.

2. Ages 6-11 Years
   - Overweight (85th-94th percentile) with no risks — maintain weight velocity
   - Overweight (85th-94th percentile) with risks — decrease weight velocity or weight maintenance
   - Obese (≥ 95th percentile) — weight maintenance or gradual weight loss of 1 lb. per month
   - BMI ≥ 99th percentile — weight loss (average is 2 pounds per week; *excessive weight loss should be evaluated for high risk behaviors*)
   - *Initiate weight plan based on readiness for change and educate.* See education resources and PCMH attachments.
III. Age 12-18 Years

- Overweight (85th-94th percentile) with no risks — maintain weight velocity. After linear growth is complete, maintain weight.
- Overweight (85th-94th percentile) with risks - decrease weight velocity or weight maintenance.
- Obese (≥95th percentile) — weight loss (average is 2 lbs. per week; excessive weight loss should be evaluated for high risk behaviors)
- BMI ≥ 99th percentile — weight loss (average is 2 lbs. per week; excessive weight loss should be evaluated for high risk behaviors)
- Note: There is insufficient evidence to recommend for or against low-calorie diets (1,000-1,200 kcal/day) for weight reduction and/or long-term weight maintenance in adolescents ages 15-18 years with BMI percentile ≥ 85% with or without co-morbidities.
- Initiate weight plan based on readiness for change and educate using pediatric weight management toolkit. See education resources and PCMH attachments.

IV. Tools For Clinicians

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational materials for families</td>
<td>See education resources and PCMH attachments.</td>
</tr>
<tr>
<td>Obesity Peds Smartset Best Practice Alert</td>
<td>The smartset is available to ease documentation with the appropriate coded diagnosis, orders and patient instructions that outline the Plan of Care. The best practice alert will trigger for BMI calculated &gt; 95% tile, which is based on height and weight. The alert will look back at visits over the past 90 days and triggers off those BMI results. When the reason is acknowledged the alert will be satisfied for 2 years. Mana Ku will alert if labs are abnormal and need to be repeated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lab Result</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDL &lt;35</td>
<td>Repeat in 1 - 2 yr.</td>
</tr>
<tr>
<td>LDL 110-129</td>
<td>Repeat in 1 yr</td>
</tr>
<tr>
<td>LDL &gt;130</td>
<td>Repeat in 6 mos.</td>
</tr>
<tr>
<td>Chol &gt;200</td>
<td></td>
</tr>
<tr>
<td>LDL &gt;190</td>
<td></td>
</tr>
<tr>
<td>LDL &gt;160 with risk factors (hypertension, acanthosis etc) or + family history= (among first- and second-degree relatives obesity, T2DM, and early cardiovascular disease)</td>
<td>Referral to Pediatric Cardiologist</td>
</tr>
<tr>
<td>ALT 2x normal</td>
<td>Repeat in 3 mos. – still abnormal, ultrasound</td>
</tr>
<tr>
<td>ALT &lt;2x normal</td>
<td>Repeat in 5-12 mos.</td>
</tr>
<tr>
<td>Hgb A1C &gt; 6.0</td>
<td>Repeat in 3-6 months and include blood sugar</td>
</tr>
</tbody>
</table>

Symptoms and Signs of Conditions Associated with Obesity

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety, school avoidance, social isolation (Depression)</td>
<td>Poor linear growth (Hypothyroidism, Cushing’s, Prader-Willi syndrome)</td>
</tr>
</tbody>
</table>
### Symptoms
- Polyuria, polydipsia, weight loss (Type 2 diabetes mellitus)
- Headaches (Pseudotumor cerebri)
- Night breathing difficulties (Sleep apnea, hypoventilation syndrome, depression)
- Daytime sleepiness (Sleep apnea, hypoventilation syndrome, depression)
- Abdominal pain (Gastroesophageal reflux, Gall bladder disease, constipation)
- Hip or knee pain (Slipped capital femoral epiphysis)
- Oligomenorrhea or amenorrhea (Polycystic ovary syndrome)

### Signs
- Dysmorphic features (Genetic disorders, including Prader-Willi syndrome)
- Acanthosis nigricans (Type 2 diabetes, insulin resistance)
- Hirsutism and Excessive Acne (Polycystic ovary syndrome)
- Violaceous striae (Cushing’s syndrome)
- Papilledema, cranial nerve IV paralysis (Pseudotumor cerebri)
- Tonsillar hypertrophy (Sleep apnea)
- Abdominal tenderness (Gall bladder disease, GERD, NAFLD)
- Hepatomegaly (Nonalcoholic fatty liver disease (NAFLD))
- Undescended testicle (Prader-Willi syndrome)
- Limited hip range of motion (Slipped capital femoral epiphysis)
- Lower leg bowing (Blount’s disease)

---

**A. PHYSICAL ACTIVITY**

1. Aerobic physical activity of moderate-to-vigorous intensity, daily for 60 minutes, is recommended for weight reduction and/or long-term weight maintenance.

**B. HEALTH EDUCATION**

1. Health education is recommended for weight reduction, long-term maintenance of weight loss and improvement of obesity-associated comorbidities in overweight and obese children.
2. Note: There is insufficient evidence to recommend for or against a specific type or intensity of counseling to promote weight reduction and/or long-term maintenance in overweight and obese children.

**C. BEHAVIORAL AND PSYCHOSOCIAL SUPPORT**

1. Consider other factors that could affect a patient's ability to maintain or lose weight, such as willingness to change and family support
2. If suspected, evaluate for significant mood disorder
3. Explore possibility of triggering factors: bullying, food scarcity, childhood trauma (abuse, violence, instability in the environment)

**V. FOLLOW UP**

- If weight maintenance is recommended, a follow-up visit in 6-12 months is recommended.
- For children and adolescents for whom weight loss is recommended, follow-up visits to assess progress with weight loss at every 3-4 months are recommended.
VI. ADDITIONAL CONSIDERATIONS

- Currently we do have collaboration of the multidisciplinary team providers; we do not yet have the structure of a comprehensive, multidisciplinary intervention or tertiary care intervention for the morbidly obese ages 2-18 years.
- In addition to weight management, assess the need for additional treatment for associated conditions.
- Consider other factors that could affect a patient’s ability to either maintain or lose weight, such as willingness to change, family support, and other behavioral and psychosocial factors.
- Note: There is insufficient evidence to recommend for or against bariatric surgery in adolescents aged 15 to <18 years with BMI $\geq 40$ kg/m$^2$ or BMI percentile $\geq 99\%$ and comorbidities (e.g., coronary heart disease, type 2 diabetes, moderate-to-severe sleep apnea, other conditions related to obesity, etc.)

VII. REFERENCES

- Melanie Shim, MD. (Kaiser Permanente, HI Region). Algorithm for Prediabetes and T2DM Identification & Intervention for Youth, Start at age 6 Years of Age. Honolulu, HI: August, 2011. Reviewed by Dr. Shim 05/2016

Attachments available on Hawaii Intranet Pediatric Website.
Attachment #1 Weight Management of Pediatric Patients Clinical Practice Guideline

Primary Nutrition Resource Handouts

Nutrition Program and Services Oahu # 1058-6049
Nutrition Program and Services Maui # 1058 6075
Nutrition Program and Services Big Island # 1058 6076
5210 Simple Steps for Healthy Ohana # 0039 8795 English
5210 Simple Steps for Healthy Ohana Chuukese
HiCORE5210-FactSheet_Chuukese
5210 Simple Steps for Healthy Ohana Ilocano
HiCORE5210-FactSheet_Ilocano
5210 Simple Steps for Healthy Ohana Marshallese
HiCORE5210-FactSheet_Marshallese
5210 Simple Steps for Healthy Ohana Samoan
HiCORE5210-FactSheet_Samoan

Additional Nutrition Resource Handouts

Heart Healthy Nutrition #0037 8927
Healthy Tips for Better Blood Sugar control #1058 6048
What You Should Know about Pre-diabetes #1051 1025
Feeding Your Toddler # 1053 5672
What's in Your Drink? # 1033 8750
Healthy Plate for HI # 1033 9026
Calories Count # 1049 9026
Lets Have Fun Exercise Booklet #1037 6875
Keiki Fit Force Activity Sheet #1049 9027
Attachment #2

**Algorithm for Prediabetes and T2DM Identification & Intervention for Youth**

Start at age 6 Years of Age

Overweight (BMI > 85th%)

plus 2 of the following:
- Family history of T2DM in 1st or 2nd degree relative
- Race/Ethnicity (Native American, African American, Latino, Asian American, Pacific Islander)
- Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, PCOS)
- Maternal history of diabetes or GDM during the child's gestation
- Child born SGA or LGA

**Perform Fasting Plasma Glucose and/or Hemoglobin A1c**

- FBG<100 mg/dL and/or A1c<5.7%
- FBG=100-125mg/dL and/or A1c 5.7-6.4%
- FBG ≥ 126 mg/dL and/or A1c > 6.5%

**Lifestyle recommendations**
Monitor every 1-3 years

**Prediabetes**

- Review signs and symptoms of hyperglycemia
- Provide Nutrition Resource handout
  If A1C ≥ 6.0 cc chart to
  P Dietary Oahu
  P Dietary Maui or
  P Dietary Big Island

**T2DM**

- Refer to Pediatric Endocrinologist
- Order glucose meter and testing supplies

Follow up and retest every 3-12 months, depending on goal achievement

**Education**
Nutrition Resource handout
Oahu # 1058 6049,
Maui #1058 6075,
Island of Hawaii # 1058 6076

Healthy Eating Tips for Better Blood Sugar Control handout # 1058 6048

What You Should Know About Pre-Diabetes # 1051 1025

Shim 8/11 reviewed 06/16
Patient Centered Medical Home (PCMH)

**SUMMARY:** DOCUMENTATION for PCMH Childhood Obesity

- **Smartsets:** Obesity Peds HI For Ages 3 to 18 Y.O. & Well Child 3-17 Y.O.
- **Best Practice Alert (BPA):** Will fire based on BMI Percentile, age over 3 yrs, and if obesity screening labs have not been completed in the past 2 yrs. The Smartset is available when the BPA fires.
- **Encounter diagnosis:** Obesity peds (Primary Dx), BMI peds (Secondary Dx used in conjunction with Primary Dx), Nutrition & Physical activity Counseling, Screening (labs)
- **Problem list:** Obesity peds
- **Progress Note:**
  - Use smartphrase to document barriers and readiness to change

  **Smartphrase:** .obesypeds
  Additional assessment for obesity
  Barriers to exercise: { :110987::"none"}
  Barriers to nutrition: { :11938::"none"}
  Ready to change: { :107271}

  - All well child progress notes have been revised to include the required documentation
- **Orders:**
  - Labs
  - Referral Health Education MAP
  - Medication – ANY NEW ORDERS FOR OBESE PTS
    - Assess pt/family understanding of med
    - Assess pt response to med and barriers to adherence
  - OTC Medication (MA Intake Workflow to document)
    - Document on med tab
- **Pt Instructions/AVS (for initial and recheck appts):**
  - **Smartphrases:** Readiness to change/Target/Goal/Confidence Level/Plan
    .weightplanready
    .weightplannotready

  **Components of smartphrases:**
  - Recheck
  - Kp.org references for self-management
- **GIVE PATIENT/FAMILY:**
  - Pt Educ Materials (3 handouts)—“Simple Steps for a Healthy Ohana” (5210 & BMI chart), “Healthy Lifestyle Goal Setting” and “Staying Healthy and Thriving as a Family” (HKHF class flyer)
  - Nutritional Counseling:
    Healthy Kids Health Family Class – Receptionist or MA can assist with scheduling
    Individual counseling – Send referral
### PCMH requirements for Childhood Obesity

**BMI > 95%tile**

#### 3C - Care Management

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conducts pre-visit preparations</td>
<td>Well Child Questionnaire documentation; Obesity recheck visits/acute visits: <strong>previsitplanning</strong> Review chart, plan for visit (test, forms, care gaps)</td>
</tr>
<tr>
<td>2. Collaborates with patient/family to develop individual care plan, including treatment goals reviewed and updated at each relevant visit.</td>
<td><strong>PI/AVS:</strong> Readiness to change: ready, not ready or unsure, target (goals)</td>
</tr>
<tr>
<td>3. Gives the patient/family a written plan of care.</td>
<td><strong>PI/AVS</strong></td>
</tr>
<tr>
<td>4. Assesses and addresses barriers when the patient has not met treatment goals.</td>
<td><strong>Prog Note:</strong> .obesitypeds smartphrase</td>
</tr>
<tr>
<td>5. Gives the patient/family a clinical summary at each relevant visit</td>
<td><strong>PI/AVS</strong></td>
</tr>
<tr>
<td>6. Identifies patient/families who might benefit from additional care management support.</td>
<td>Referral to HFHK class or refer to dietitian for individual counseling</td>
</tr>
<tr>
<td>7. Follows up with patients/families who have not kept important appointments.</td>
<td>No show process</td>
</tr>
</tbody>
</table>

#### 3D - Medication Management

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reviews and reconciles medications with patients/families.</td>
<td>Intake: MA verifies medication, MD confirms</td>
</tr>
<tr>
<td>2. Provides information about new prescriptions to patients/families.</td>
<td>MD order, instructs on taking new med. <strong>PI/AVS</strong> – print new order</td>
</tr>
<tr>
<td>3. Assesses patient/family understanding of medications for patients with date of assessment.</td>
<td><strong>Prog Note:</strong> document understanding</td>
</tr>
<tr>
<td>4. Assesses patient response to medications and barriers to adherence for patients with date of assessment.</td>
<td>Recheck appt - <strong>Prog Note:</strong> assess response and barriers to adhererance</td>
</tr>
<tr>
<td>5. Documents over-the-counter medications, herbal therapies and supplements for patients/families, with the date of updates.</td>
<td>Intake: MA adds OTC meds, MD verifies</td>
</tr>
</tbody>
</table>

#### 4A - Support Self-Care Process

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provides educational resources or refers patient/families to educational resources to assist in self-management.</td>
<td><strong>PI/AVS:</strong> kp.org resources</td>
</tr>
<tr>
<td>2. <strong>Uses an EHR to identify patient-specific educational resources and provide them to patients, if appropriate.</strong></td>
<td><strong>PI/AVS</strong></td>
</tr>
<tr>
<td>3. <strong>Develops and documents self-management plans and goals in collaboration with patients/families.</strong></td>
<td><strong>PI/AVS</strong> - .weightplanready or .weightplannotready smartphrase</td>
</tr>
<tr>
<td>4. Documents self-management abilities for patients/families.</td>
<td><strong>PI/AVS:</strong> kp.org resources, <strong>Prog Note:</strong> .obesity smartphrase</td>
</tr>
</tbody>
</table>
| 5. Provides self-management tools to record self-care results for patients/families. | Handouts (from toolkit):  
  - Healthy Lifestyle Goal Setting/Tracker (self-mgt tool) [0037 9630 4/10]  
  - Simple Steps for a Healthy Ohana" (5210 & BMI chart) [0039 8795 8/11]  
  - Staying Healthy and Thriving as a Family (HKHF class flyer) [1030 4293 8/12]  
  - weightplanready or .weightplannotready smartphrase 5-2-1-0 message on the AVS |
| 6. Counsels patients/families to adopt healthy behaviors                    | **weightplanready or .weightplannotready smartphrase**                       |

**Key measure for PCMH review (MUST PASS)**