



INDIAN HEALTH DIABETES BEST PRACTICE

Youth and Type 2 Diabetes Prevention and Treatment

Revised April 2011

Note! Please review the Best Practice Addendum, which provides the most current information on the Required Key Measures along with examples of ways to obtain the measures. The Best Practice Addendum can be found here: http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/BP_2011_Table_RKM_508c.pdf

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Instructions for Using This Best Practice

The Best Practices are organized into topics on how to plan for and successfully implement a Best Practice in your community.

- **Part 1** provides background information on planning for your program and evaluation, Key Recommendations, and Key Measures.
- **Part 2** provides details on implementation of the Key Recommendations.
- **Part 3** includes appendices, tools, and resources.
- **Part 4** provides a list of references.

As you prepare to select, implement, and evaluate a Best Practice, consider these planning guidelines:

- Meet with your diabetes team to discuss which Best Practice(s) is best suited for your situation and resources.
- Use data from your *Diabetes Care Outcomes and Audit* and/or from a community needs assessment to guide your selection of the Best Practice(s).
- Determine your program goal(s) as a team. For example, your team may decide to work toward increasing the number of people who receive eye exams.
- Print out at least Part 1 of the Best Practice(s) your team feels is most appropriate to implement.
- Work with your diabetes team to review and discuss the Best Practice(s). You may choose to read it together as a team.
- Choose at least one Best Practice after carefully considering your goals and resources (funding, staff, and time).
- **Review the entire Best Practice(s) you have selected with your diabetes team:**
 - Confirm that you have selected a Best Practice(s) appropriate for your community needs and resources and that you are confident that your team can successfully implement, evaluate (measure), and document progress and outcomes.
 - Target the population your team wants to improve outcomes for with the Best Practice(s). Remember, you probably do not have resources to do everything for everyone.
 - Carefully consider the Key Recommendations. The recommendations are based on evidence and have been proven to be effective. You may already be doing some of the recommendations and can easily fit these into your plan, or you may want to consider some new recommendations to enhance and strengthen your program. Identify those your team can implement.
 - Carefully review the Key Measures. Choose those that best fit with your goals and the Key Recommendations you have chosen to implement.
 - If one Best Practice does not fit, then review another Best Practice until you find one that fits.

Throughout the document you will find links that draw your attention to important items within the Best Practice pdf. Here is a list of the items:

- **Action!** Indicates a **link**. Please use the link to access more detailed descriptions.
- **Note!** Indicates an **important** item. Pay special attention to this **important** item.

Summary of Key Recommendations and Key Measures

Key Recommendations. These are evidence-based actions that will lead to improved outcomes in the community. **Action! See [Part 2](#)** for details on the implementation of each key recommendation.

1. Screen for overweight and obesity in all youth.
2. Test for pre-diabetes and diabetes in at-risk youth.
3. Use healthy eating and physical activity guidelines for youth.
4. Implement an education and prevention/treatment plan for youth who are overweight, obese, have pre-diabetes, and/or have diabetes.
5. Engage families in the planning and implementation of the youth and type 2 diabetes prevention and treatment program.

Additional Key Recommendations for Diabetes Prevention

Action! See the IHS Diabetes Best Practices for 1) Pregnancy and 2) Breastfeeding for content relating to the following two recommendations.

6. Maintain normal blood glucose in all pregnant women with diabetes.
7. Promote breastfeeding of infants for at least two months by all postpartum women.

Key Measures. These are specific measures that can be used to document changes in outcomes related to implementing the Best Practice.

Note! All SDPI grant programs that choose this Best Practice must report as required in the terms and conditions attached to the notice of award on the indicated Measures. Programs may report on other measures as well.

*The following measures are of primary importance:

Screening:

1. *Percent of youth in the target population screened for overweight and obesity in the past twelve months.
2. *Percent of youth in the target population with a screening BMI result greater than the 85th percentile tested for pre-diabetes/diabetes in the past twelve months.
3. Percent of youth who are overweight or obese.
4. Number of new pre-diabetes/diabetes cases in the past twelve months.

Education and Treatment Intervention:

5. *Percent of youth in the target population with an increase in both healthy eating and physical activity behaviors in the past twelve months.
6. Percent of youth who are overweight, obese, and/or have pre-diabetes/diabetes with completed education and prevention/treatment plans in the past twelve months.
7. Percent of parents/caregivers of youth in the target population with documented program participation in the past twelve months.

PART 1 Essential Elements of Implementing This Best Practice

Purpose and Target Population

This Best Practice describes recommendations for health care that serves youth (ages 2–18) who are at risk for, or have, type 2 diabetes. Organizations and communities that successfully implement these recommendations can expect to increase the number of youth at a healthy weight, reduce the number of new cases of type 2 diabetes, and improve blood glucose, blood pressure, and lipid control in youth with type 2 diabetes.

Intended Users of This Best Practice

- Primary health care teams,
- educators,
- diabetes prevention outreach teams/health promotion services,
- community or school workers who provide education and/or services,
- volunteers in health care programs, and
- leaders of health care organizations.

Action! See [Part 3](#) – Appendix A. Supplemental Information for discussion of the benefits and risks of implementing this Best Practice.

Definition of Youth and Type 2 Diabetes Prevention and Treatment

A youth and type 2 diabetes prevention and treatment program includes activities that aim to prevent and/or treat type 2 diabetes in youth.

Goals of This Best Practice

Screening Goals

- To develop written screening program guidelines for youth who are at risk for diabetes.
- To increase screening for overweight and obesity in youth.
- To develop written program guidelines for testing, assessing, and referring for pre-diabetes and diabetes in at-risk youth.
- To increase percentage of youth tested for pre-diabetes and diabetes.

Education and Treatment Intervention Goals

- To increase the use of healthy eating and physical activity guidelines for youth by the health care team.

- To increase the percentage of youth engaging in healthy eating and physical activity behaviors.
- To increase the percentage of written education and treatment plans for youth who are overweight, obese, have pre-diabetes and/or have diabetes.

Action! See IHS Diabetes Best Practices for 1) Pregnancy and 2) Breastfeeding for content related to the following additional goals for diabetes prevention for youth:

- To increase the percentage of pregnant women with diabetes who maintain normal A1C/blood glucose during pregnancy.
- To increase the percentage of newborn infants who are exclusively breastfed for at least two months.

Key Recommendations

These are evidence-based actions that can lead to improved outcomes for persons with type 1 or type 2 diabetes.

These are evidence-based actions that will lead to improved outcomes in the community.

1. Screen for overweight and obesity in all youth.
2. Test for pre-diabetes and diabetes in at-risk youth.
3. Use healthy eating and physical activity guidelines for youth.
4. Implement an education and prevention/treatment plan for youth who are overweight, obese, have pre-diabetes, and/or have diabetes.
5. Engage families in the planning and implementation of the youth and type 2 diabetes prevention and treatment program.

Additional Key Recommendations for Diabetes Prevention

Action! See IHS Diabetes Best Practices for 1) Pregnancy and 2) Breastfeeding for content relating to the following two recommendations.

6. Maintain normal blood glucose in all pregnant women with diabetes.
7. Promote breastfeeding of infants for at least two months by all postpartum women.

Action! See [Part 2](#) for details on the implementation of each key recommendation.

Planning for Your Program and Evaluation

Key Action Steps include:

1. **Identify your program's goal(s).** There are many program goals consistent with the Key Recommendations of this practice. Choose program goals that fit with the Key Recommendations and your resources. Examples of program goals include:
 - Screen youth ages 6–12 for overweight and obesity.
 - Promote healthy eating and physical activity behaviors in youth ages 6–12 through clear messages based on guidelines.

2. **Define program objectives** that will be met to reach the program goal(s) in the **SMART format** (specific, measurable, action-oriented, realistic, and time-bound).

Examples of SMART objectives for this Best Practice:

- The number of youth ages 6–12 screened for overweight and obesity will increase from 45% to 65% during the next twelve months.
 - The number of youth ages 6–12 self-reporting healthy eating behaviors will increase from 40% to 60% during the next twelve months.
 - The number of youth ages 6–12 self-reporting healthy physical activity behaviors will increase from 50% to 60% during the next twelve months.
3. **Use Key Measures.** The following Key Measures can be used to monitor progress and the effectiveness of implementing this Best Practice. Results of measures will indicate the degree of success in implementing the **Key Recommendations** and meeting program goals.

Measures of progress need to occur before the intervention (baseline) and at designated times thereafter. Measurement needs to be frequent enough to provide meaningful information for planning and evaluation.

Key Measures

Note! All SDPI grant programs that choose this Best Practice must report **as required in the terms and conditions attached to the notice of award on the indicated Measures**. Programs may report on other measures as well.

*The following measures are of primary importance:

Screening:

1. *Percent of youth in the target population screened for overweight and obesity in the past twelve months.
2. *Percent of youth in the target population with a screening BMI result greater than the 85th percentile tested for pre-diabetes/diabetes in the past twelve months.
3. Percent of youth who are overweight or obese.
4. Number of new pre-diabetes/diabetes cases in the past twelve months.

Education and Treatment Intervention:

5. *Percent of youth in the target population with an increase in both healthy eating and physical activity behaviors in the past twelve months.
6. Percent of youth who are overweight, obese, and/or have pre-diabetes/diabetes with completed education and prevention/treatment plans in the past twelve months.
7. Percent of parents/caregivers of youth in the target population with documented program participation in the past twelve months.

4. **Collect, record, and analyze data** on an ongoing basis; share with the team and the organization leadership.
5. **Use creative ways to display data and measure outcomes, such as graphs or charts.** This helps the team understand the data and know whether there are improvements.
6. **Think about what the data are telling you.** What changes are you seeing? Are there improvements? Use data for planning next steps.

Action! Link to the following resources to help your program improve.

See [Part 3](#) – Appendix B. **Key Measures Example** to assist you with identifying ways to choose Key Measures that incorporate your community data.

See [Part 3](#) – Appendix C. **Improving Youth and Diabetes Programs Example** to assist you with applying Key Recommendations and Key Measures to a program plan.

Action! See an **online training** and a **workbook** to get more ideas about setting goals and objectives and developing a program plan. Available from:
<http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Training/WebBased/Basics/Creating/Workbook.pdf> (see pages 23-28).

Team Notes:

PART 2 Key Recommendations

Note! Part 2 provides **important** detail on the “why?” and “how?” of implementation of each Key Recommendation.

Key Recommendation 1. Screen for overweight and obesity in all youth.

Why?

Early case finding and diagnosis of youth at risk for developing, or having, type 2 diabetes, as well as referral of youth and parents into the health care system, may prevent type 2 diabetes and its complications (Rosenbloom and Silverstein, 2003).

How to Implement the Key Recommendation

- A. **Identify the target population** for screening as all youth ages 2 to 18 in the community.
- B. **Identify a variety of places in community where screening can be done**, such as schools (including Head Start and preschool), day care centers, after-school activity locations, Boys and Girls Clubs, health clinics, churches, and health fairs.
- C. **Introduce the screening program to staff** at screening sites (including clinic staff), parents, and community members.
- D. **Obtain parental consent** for screening.
- E. **Train staff** at screening sites in a standard measurement protocol.

Action! See tutorial at:

<http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsAnthroHowto>

- F. **Develop a protocol** for height and weight measurement that includes:
 - Accurate measurement, including checking heights and weights twice
 - Use of standardized accurate equipment [scales and stadiometers (height measurement tool)]
 - Data collection procedure
 - Periodic quality control checks
 - Data collection forms
 - Calculations and interpretation of data
 - Distribution of completed data forms
 - Communications with parents. [Note: communication about a child's weight status to parents should be conveyed carefully and with sensitivity.]

Action! See [Part 3](#) – Appendix D. Considerations for Educators When Providing Information about Healthy Weight.

- G. **Designate a qualified program team member to receive all completed data forms from screening sites and convert the data into BMI percentiles** for sex, age, and gender.

Action! See CDC BMI Percentile Calculator for Children and Adolescents at <http://apps.nccd.cdc.gov/dnpabmi>.

Action! See [Part 3](#) – Appendix E. Steps for Calculating and interpreting BMI Using the BMI Percentile Calculator.

H. **BMI may also be calculated by:**

$$\text{BMI} = \text{Wt}(\text{kg}) \div \text{Ht}(\text{m})^2$$

BMI equals weight in kilograms divided by height in meters squared

I. **Use the BMI percentile to assess youth at-risk for diabetes** and need for referral (Nsiah-Kumi et al., 2010).

BMI is a reliable indicator of body fatness for most children and teens. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat. BMI can be considered an alternative for direct measures of body fat. Additionally, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems. <http://www.cdc.gov/healthyweight/index.html>

J. Refer **all youth with a BMI greater than the 85th percentile** to their health care provider for diagnostic testing, assessment of eating and physical activity behaviors, and an age-appropriate multi-disciplinary education and treatment plan.

Action! See [Key Recommendation 4](#): Implement an Education and Treatment Plan for information on developing education and treatment plans.

K. Provide normal screening results to the youths' health care provider. **An annual BMI calculation should be part of normal health supervision** (Peterson et al., 2007) and an annual assessment of obesity risk and diabetes risk. **Because AI/AN people have a high prevalence of diabetes, and because early intervention in diabetes improves outcomes, health care providers may consider testing for pre-diabetes/diabetes when the BMI is normal but other diabetes risks are present**, such as family history of type 2 diabetes (1st or 2nd degree relative), maternal history of diabetes or gestational diabetes mellitus (GDM) during the child's gestation, and large-for-gestational age (LGA) birth weight or small-for-gestational age (SGA) birth weight.

L. **Rescreen annually.**

Team Notes:

Key Recommendation 2. Test for pre-diabetes and diabetes in at-risk youth.

Why?

Type 2 diabetes in children can go undiagnosed for a long time. Children may have no symptoms or mild symptoms. Blood tests are needed for diagnosis.

<http://www.cdc.gov/diabetes/projects/cda2.htm>

Early case finding and diagnosis of youth at risk for developing, or having, type 2 diabetes, as well as referral of youth and parents into the health care system, may prevent type 2 diabetes and its complications (Rosenbloom and Silverstein, 2003).

How to Implement the Key Recommendation

- A. **Testing for pre-diabetes/diabetes should be done in a clinical health care setting** as part of a comprehensive assessment of risk for pre-diabetes and diabetes as well as other metabolic conditions and comorbidities. Testing is performed on those referred from screening, or as the need is identified during routine health care visits. **Because AI/AN people have a high prevalence of diabetes, and because early intervention in diabetes improves outcomes, health care providers may consider testing for prediabetes/diabetes when the BMI is normal but other diabetes risks are present**, such as family history of type 2 diabetes (1st or 2nd degree relative), maternal history of diabetes or gestational diabetes mellitus (GDM) during the child's gestation, or large-for-gestational age (LGA) birth weight or small-for-gestational age (SGA) birth weight.
- B. **Testing should include** the following (August et al., 2008):
- FPG or 2-hour 75-g OGTT to test for diabetes or assess future risk.
An A1C is also appropriate to use for testing. (ADA, 2011).
 - Fasting lipid profile (12–14 hour fast)
 - Blood pressure
 - ALT to evaluate for fatty liver
 - Additional labs to evaluate any other assessment findings indicating other conditions or comorbidities
- C. **Perform testing with a venous blood sample.**
- D. **Diagnostic criteria for pre-diabetes and diabetes** are (ADA,2011):

Diagnostic Criteria for Pre-diabetes and Diabetes

	Pre-diabetes	Diabetes
FPG	100–125 mg/dL (IFG)	≥ 126 mg/dL
2-hour plasma glucose	140–199 mg/dL IGT)	≥ 200 mg/dL
A1C	5.7%–6.4%	≥ 6.5%

A random plasma glucose ≥ 200 mg/dL with classic symptoms of hyperglycemia or hyperglycemia crisis is also diagnostic of diabetes.

In the absence of hyperglycemia, repeat testing should be done to confirm diagnosis.

Note! The use of A1C for diagnosis of pre-diabetes and diabetes in adolescents may be premature until information from more definitive studies are available. (Lee et al., 2011).

- E. **Refer youth with pre-diabetes and diabetes** to appropriate health care providers.
- F. **Refer youth with pre-diabetes and diabetes** to the youth type 2 diabetes prevention and treatment program.
- G. **Distinction between type 1 and type 2 diabetes in children can be difficult** because the prevalence of overweight in children continues to rise and because autoantigens and ketosis may be present in a substantial number of children with features of type 2 diabetes (including obesity and *acanthosis nigricans*). Such a distinction at the time of diagnosis is critical because treatment regimens, educational approaches, and nutrition counseling will differ markedly between the two diagnoses (ADA, 2011).
- H. **Refer at-risk youth with normal test results** to the youth type 2 diabetes prevention and treatment program. Rescreen for BMI and other diabetes risk factors annually and test as indicated.

Team Notes:

Key Recommendation 3. Use healthy eating and physical activity guidelines for youth.

Why?

The prevalence of obesity among preschoolers in the United States is evidence that problem eating behaviors begin early in life. These dietary patterns are associated with increased risk of chronic disease, including type 2 diabetes, cardiovascular disease, hypertension, and some cancers (Fox et al., 2010).

Elevated BMI early in life is associated with adult obesity (Freedman et al., 2005).

Children's eating patterns and food preferences are well established in early life and are greatly affected by parenting styles (May and Dietz, 2010).

The epidemic of type 2 diabetes, which includes AI/AN communities, is associated with decreasing levels of physical activity and an increasing prevalence of obesity. Promoting physical activity is a crucial component of the prevention and management of type 2 diabetes and many other chronic diseases (HHS, 2007, 2009, 2011; Physical Activity Guidelines for Americans, 2008).

How to Implement the Key Recommendation

- A. **Action! See the IHS Diabetes Best Practice on Breastfeeding** for recommendations on infant feeding guidelines. Breastfeeding provides many benefits, including a role in diabetes prevention (Murphy and Wilson, 2008). The American Academy of Pediatrics recommends exclusive breastfeeding for about the first six months of life followed by continued breastfeeding for at least the first years as complementary foods are introduced (Gartner et al., 2005). Exclusive breastfeeding for the first two months of life has been associated with a 40% reduction in type 2 diabetes among Pima Indians (Pettit et al., 1997).
- B. **Provide education on healthy eating and physical activity guidelines**—for knowledge, skills, and behavior change—to all youth.
- C. **Provide staff education** on healthy eating and physical activity guidelines for youth in order to provide parents and youth with appropriate, clear, consistent, and timely messages about guidelines. Include:
 - Health care staff
 - School and pre-school staff
 - Sport coaches
 - Daycare staff
 - Staff in supplemental food programs
- D. **Provide parents and caregivers with frequent, appropriate, clear, consistent, and timely recommendations** about healthy eating and physical activity guidelines that address age-related transitions.

- E. **Develop coalitions** of parents, health care organizations, schools, and community organizations and leaders to promote guidelines.
- F. **Target the home environment and child-care settings.** Parents shape their children's eating environment beginning at birth. Improvements in the intake of healthy choices will require changes in parental choices. Obesity intervention programs targeting parents' behaviors may be more beneficial in achieving desirable outcomes related to child weight than those that exclusively focus on children (May and Dietz, 2010).
- G. **Healthy eating guidelines** include (Dietary Guidelines for Americans, 2010; Feeding Infants and Toddlers Study, 2010; USDA Food Guidance System):
- Choose healthy drinks.
 - Make water the first choice for drinks.
 - Choose sugar-free drinks.
 - Eat three meals a day, including breakfast.
 - Keep snacks small and healthy.
 - Eat a variety of foods from all the food groups.
 - Expose children to a variety of healthy foods at an early age.
 - Eat healthy amounts of food.
 - Eat five or more fruits and vegetables a day.
 - Eat more whole-grains.
 - Eat less high-fat foods.
 - Eat less fast food.
 - Pay attention to body messages for hunger and fullness.
 - Importance of family meals.
 - Handle refusals to eat in healthy ways.
 - Avoid overfeeding and food rewards/punishments.
 - Individualize guidelines based on nutrition needs and food preferences.
- H. **Healthy physical activity guidelines** include (Physical Activity Guidelines for Americans, 2008):
- Be physically active one hour or more every day.
 - Engage in two hours or less of screen (sitting) time each day.
 - Develop enjoyable lifetime fitness activities.
 - Individualize guidelines based on current activity level and personal preferences.
- I. **Use educational tools that support a clear message**, such as:
- *5-2-1-0 Campaign*
 - *Family Calendar*
 - *Go. Slow. Whoa.*
 - *Helping Hands*
 - *Hunger-Fullness Scales*

- *Kid's Activity Pyramid*
- *Just Move It*
- *Let's Move*
- *MyPyramid for Kids*

Action! See [Part 3](#) – Appendix F. Sample Educational Tools for Healthy Eating and Physical Activity Guidelines for resource information.

Action! See IHS *Youth Staying Healthy* curricula—*A Diabetes Prevention Curriculum for Youth Ages 8-12* and *A Type 2 Diabetes Curriculum for Teens* for *Eat for Health and Be Physically Active* for lesson plans, activities, and visuals for youth and parents.

Team Notes:

Key Recommendation 4. Implement an education and prevention/treatment plan for youth who are overweight, obese, have pre-diabetes, and/or have diabetes.

Why?

Clinical trials, such as the TODAY study (Treatment Options for Type 2 Diabetes in Adolescents and Youth), provide insight into treating youth with type 2 diabetes. The TODAY Lifestyle Program (TLP) provides a model for taking a comprehensive, continuous care approach to the treatment of severe overweight in youth with comorbid medical conditions such as type 2 diabetes. The TLP is based on the assumption that knowledge alone is not sufficient to change behavior, and that individuals and families need intensive, ongoing support and training in behavioral skills needed to lose weight and maintain weight loss (The TODAY Study Group, 2009).

An individual plan, based on individual assessment and developed collaboratively among the youth, parents, and health care team, can effectively guide education interventions and self-management support strategies (National Standards for DSME, 2008).

How to Implement the Key Recommendation

Education and Treatment Plan

- A. **Obtain parental consent** for program participation.
- B. **Develop a youth type 2 diabetes education and prevention/treatment plan**, which:
 - is age-appropriate
 - focuses on promoting healthy behaviors
 - reflects a multidisciplinary team approach
 - focuses on self-care behaviors
 - is family-focused
 - includes self-management support
 - includes medical treatment
 - includes follow-up
 - includes evaluation
- C. **Make education and treatment plans age-appropriate.**

Action! See IHS *Youth Staying Healthy* curricula for developmental considerations for children and teens.

- D. **Focus program efforts on promoting healthy behaviors** in youth to help them stay healthy and delay or prevent diabetes/diabetes complications.

E. **Use a multidisciplinary team management approach** to develop the plan. Teams may include a physician, registered dietitian, fitness specialist, nurse clinician, behavioral health staff, social services staff, and the youth and his/her parents. It is not necessary to have a large team; however, youth and their parents need to be an integral part of any team.

F. **Focus on self-care behaviors**, including:

- eating healthfully
- being physically active
- self-monitoring
- taking medicine (if needed)
- lowering risks for health problems
- handling feelings and stress in healthy ways (coping)
- making healthy choices (problem solving)

Action! See AADE7™ resources at <http://www.diabeteseducator.org/ProfessionalResources/AADE7/>.

Screen for barriers to self-care at every encounter/visit.

G. **Keep plan family-focused**, such as including:

- family meals
- family physical activity

H. **Include self-management support** in plan, such as:

- peer support, including support groups and youth camps
- family support, including family meals and physical activity
- community support, such as biking/walking trails and ball courts
- school support, including daily physical activity and healthy vending machine choices

I. **Include medical treatment as appropriate**

Action! See [Additional Components for Treatment Plan](#).

J. **Include follow-up** in plan.

- Most youth will need ongoing support to sustain diabetes prevention and diabetes self-management behaviors.
- Develop a personalized follow-up plan for ongoing self-management support collaboratively among the youth, parents, and health care team.

K. Include evaluation in plan.

- Review the education and treatment plan regularly to assure it is comprehensive, team-managed, and effective.
- Include evaluation of:
 - Program process and outcomes
 - Participant outcomes.
- **Evaluate outcomes through consistent methods and measurements at specific intervals**, including baseline and post-intervention assessment. Include assessment of youth, parent, and community satisfaction in evaluation. Analyze all outcomes—positive and negative—and use analysis for ongoing program planning.

Team Notes:

Additional Components for Education Plan

- A. **Complete an educational needs assessment**, which includes parental input and is appropriate to age and development.

Action! See *IHS Youth Staying Healthy* curricula for sample educational needs assessments.

- B. **Make an education plan** that individualizes educational interventions based on the educational needs assessment.

- C. **Identify educational interventions that seek to address areas that have been shown to contribute to problems with weight management and diabetes prevention and treatment.**

Action! See [Recommendation 3](#) for healthy eating and physical activity guidelines.

- D. **Use age-appropriate and culturally specific educational materials** designed for youth.

Action! See curricula in [Part 3](#) – Tools and Resources.

- E. **Use teaching techniques that are hands-on, fun, active, interactive, and problem solving**, such as:

- hands-on activities that involve doing, reflecting, and applying
- games
- movement
- music
- project work
- take-home experiments
- field trips

- F. **Focus on behavior change.** Methods for goal achievement and reinforcement of behavior change include:

- The Free Choice approach, which is well suited for a variety of cultures and ethnic groups. In this intervention the educator listens to the individual to determine preferences, traditions, and beliefs that impact eating behaviors, making gradual adjustments in the pattern of behavior to promote a healthy lifestyle (TODAY, 2010).
- Setting youth-identified behavioral goals.
- Use of praise and family-based reward systems. The youth and his/her parents can develop a list of acceptable rewards and privileges together.
- Educate parents on ways to create a home environment that supports behavior change and involve all family members in support of the youth's behavior change efforts.

G. **Support small successive changes in behavior** to achieve desired outcomes. This may be accomplished through:

- goal setting
- reinforcement for goal achievement
- stimulus control
- self-management support
- problem solving
- use of motivational techniques, including rewards

H. **Evaluate behavioral outcomes** based on youth-identified goals.

Action! See 1) **National Standards for Diabetes Self-Management Education (DSME)** at http://care.diabetesjournals.org/content/31/Supplement_1/S97.extract and 2) the **IHS Diabetes Self-Management Education Best Practice** for guidance on providing quality self-management education.

Team Notes:

Additional Components for Treatment Plan

A. Review guidelines

- American Academy of Pediatrics treatment recommendations for youth with type 2 diabetes (Gahagan et al., 2003). Available online at: <http://aappolicy.aappublications.org/cgi/reprint/pediatrics;112/2/424>.
- Gahagan S, and Silverstein J; Committee on Native American Child Health and Section on Endocrinology. Prevention and treatment of type 2 diabetes mellitus in children, with special emphasis on American Indian and Alaska Native children. Pediatrics. 2003;112:328–47. Available online at: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;112/4/e328>.
Note! A statement of reaffirmation for this policy was published on January 1, 2009.
- American Academy of Family Practice Guidelines, Management of Type 2 Diabetes in Youth: An Update, available online at: <http://www.aafp.org/afp/20070901/658.html>.

B. Establish diagnosis

Pre-diabetes is a risk factor for type 2 diabetes, and youth with pre-diabetes need to be referred to the youth and type 2 diabetes prevention and treatment program for diabetes prevention intervention.

Diagnostic Criteria for Pre-diabetes and Diabetes

	Pre-diabetes	Diabetes
FPG	100–125 mg/dL (IFG)	≥ 126 mg/dL
2-hour plasma glucose	140–199 mg/dL (IGT)	≥ 200 mg/dL
A1C	5.7%–6.4%	≥ 6.5%

A random plasma glucose ≥ 200 mg/dL with classic symptoms of hyperglycemia or hyperglycemia crisis is also diagnostic of diabetes.

In the absence of hyperglycemia, repeat testing should be done to confirm diagnosis.

Note! The use of A1C for diagnosis of pre-diabetes and diabetes in adolescents may be premature until information from more definitive studies are available (Lee et al., 2011).

C. Complete a medical history with psychosocial assessment, including:

- emotional health
- eating disorders
- alcohol, tobacco, and drug use
- family support
- obesity comorbidities (obstructive sleep apnea and polycystic ovary syndrome), if applicable

D. Complete a physical exam, including:

- Plot patient's weight and height on a growth chart including BMI.
- Measure weight and height at each visit because children are growing. .

- Measure blood pressure at each visit. The goal for blood pressure is less than 90th percentile based on height and weight standards (Gahagan et al., 2003).
- Look for signs of other comorbid conditions, including hirsutism, acanthosis nigricans, skin tags, and orthopedic problems
- Conduct a foot exam for youth with diabetes at each visit. Use 5.07 Semmes-Weinstein monofilament to assess protective sensation on an annual basis.

E. Obtain laboratory work, including:

1. **Initial** (if not already done with testing after screening)

- insulin antibodies
- fasting plasma glucose
- liver function test
- microalbuminuria
- lipid profile (repeat every three years if normal)
- A1C
- creatinine

Note: The concentrations of C peptide and insulin should not be measured routinely. When differentiations between type 1 and type 2 diabetes mellitus is difficult, consultation with a subspecialist with expertise in type 2 diabetes mellitus in children and adolescents is recommended (AAP Clinical Report, Prevention and Treatment of Type 2 Diabetes Mellitus in Children with Special Emphasis on American Indian and Alaska Native Children, 2003).

2. **Quarterly**

- A1C
- fasting glucose

3. **Yearly**

- microalbuminuria
- lipids
- creatinine if hypertensive or on ACE therapy

F. Medication management (Zeitler, 2010)

1. **Initial**

- If A1C is > 9% and/or symptoms of hyperglycemia (not in ketoacidosis):
Basal insulin 0.2–0.4 units/kg at whatever time of day promotes adherence.
- Metformin 500 mg once/day and tritrate weekly to a target dose of 2,000 mg/day. (It takes three to four weeks for the effects of metformin to be seen.)
- Self-monitoring of blood glucose (SMBG):
Daily fasting and two-hour postprandial are recommended.
- Target blood sugars(ADA, 2011; Gahagan 2003):

Ideal targets: more than 50% of SMBG within target range

- Fasting: 80–120 mg/dL (4.4–6.7 mmol/L)
- Postprandial (two hours after start of meal): 100–160 mg/dL (5.6–8.9 mmol/L)
- Bedtime: 100–160 mg/dL (5.6–8.9 mmol/L)
- Individual target blood sugar goals are based on individual needs and abilities of the youth with diabetes and may change over time. If A1C is < 9% and/or asymptomatic:
 - Metformin: 500 mg once/day and titrate weekly to a dose of 2,000 mg/day
 - SMBG: A few times a week, especially during illness and symptoms

Note! Ketoacidosis is not covered in this Best Practice.

2. Ongoing

- Medication and treatment plan should be modified to meet the youth's needs and metabolic goals. Insulin can be adjusted as appropriate.

Action! See [Part 3](#) – Appendix G. for Resources for More Information on Management of type 2 diabetes in youth.

G. Annual exams

- ophthalmology
- comprehensive foot exam
- dental

H. Annual counseling

- diabetes-related pre-conceptual counseling for girls of childbearing age
- psychosocial assessment/adherence, including screening for depression, eating disorders, and substance use/abuse

I. Immunizations

- routine childhood immunizations
- pneumovax
- influenza

J. Other referrals as appropriate, such as:

- genetics if there is a syndromic appearance
- sleep study if obstructive sleep apnea is identified
- endocrinology if abnormal growth pattern or LDL > 190

Team Notes:

Key Recommendation 5. Engage families in the planning and implementation of the youth type 2 diabetes prevention and treatment program.

Why?

Research indicates that parental involvement in pediatric weight-loss treatment is related to better treatment outcomes, and the inclusion of family members in a weight loss treatment for adolescents is supported by current developmental theory that acknowledges adolescents' desire for adult involvement and closeness in their lives. The influence of parents, adult authority figures, and family functioning on adolescents has been well documented (TODAY Study Group, 2009).

Obesity intervention programs targeting parent behaviors may be more beneficial in achieving desirable outcomes related to child weight than those that exclusively focus on children (May and Dietz, 2010).

Adolescents with type 2 diabetes are unlikely to create and sustain changes in eating habits, physical activity, and lifestyle without the support of family members (IOM, 2009).

Additional barriers to change identified by adolescents with type 2 diabetes and their parents include lack of perceived normalcy, especially with respect to food choices, environmental challenges at school and in the home, and the lack of opportunity to interact with other adolescents with type 2 diabetes. (Mulvaney et al., 2006, 2008)

Family involvement in diabetes management strategies is associated with fewer unhealthy behaviors (Bradshaw B, 2002).

How to Implement the Key Recommendation

- A. **Involve parents/caregivers** in their child's health assessment and treatment plan.
- B. **Encourage a family support person**, who may or may not be the youth's parent, to participate in health care visits.
- C. **Engage parents/caregivers in the education process.** Facilitate communication between youth and parent/caregiver, and encourage them to identify a mutually acceptable and beneficial level of parental participation in education. The degree of participation will depend on family preference and the developmental stage of the youth.
- D. **Use educational materials developed for, and targeted to, parents.** .

Action! See IHS *Youth Staying Healthy* curricula for parent visuals and activities.

- E. **Offer activities that include more than one family**, such as cooking demonstrations or family walking activities, to social support for the youth and the parents.

F. Educate parents/caregivers on:

- the use of praise

- family-based reward systems
- ways to create a home environment that supports behavior change
- diabetes prevention and treatment, their role in the program, and family tools they can use at home
- how they can advocate for diabetes prevention and treatment for youth in their community

G. **Encourage parents/caregivers** to participate on a youth type 2 diabetes prevention and treatment program advisory committee.

Team Notes:

Community Recommendations

1. Establish a whole-community approach.

Why?

The rise of diabetes in AI/AN communities is complex and multifaceted. In addition to the association between type 2 diabetes youth and unhealthy diet, lack of physical activity, childhood obesity, unemployment, poverty, lower socioeconomic status, overcrowded living conditions, psychosocial stress, social injustice, trauma, and forced cultural change also play roles (Moore, 2010).

How to Implement the Key Recommendation

1. Establish partnerships and coalitions.

- Include youth and their families in program planning.
- Include families, schools, communities, and health care organizations to create environments in which children can form healthy behaviors early in life to prevent overweight, obesity, and chronic diseases such as diabetes (IOM, 2009).
- Conduct forums or talking circles to discuss basic issues of childhood overweight, its potential effects, and the partners' role in addressing these issues.
- Establish a dialogue with all community partners addressing recommendations from the Institute of Medicine 2008 report on preventing childhood obesity available from: <http://www.iom.edu/CMS/3788/51730.aspx>.
- Acquire a dedicated youth program staff member who works directly with youth on a daily basis. For example, depending on the program's infrastructure, a successful and effective youth and type 2 diabetes program may be as simple as one adult, a bag of basketballs, and jump ropes.

2. Establish programs to increase healthy eating and physical activity behaviors in families.

- Conduct community-wide campaigns. Identify current resources, needs, barriers, and solutions from a community perspective and enlist aid from a variety of community programs, including Tribal government.
- Provide social support in community settings to increase physical activity (e.g., buddy systems, contracts to complete specific levels of physical activity, and walking groups).
- Involve parents in nutrition and physical activity education through school homework.

3. Improve the community environment so it addresses food insecurity and is supportive of healthy eating and physical activity behaviors.

- Include local and Tribal government in making environmental and policy changes, such as providing safe playgrounds. Working with schools and restaurants to offer appropriate portion sizes and healthier food choices is another example of whole community input.
- Eliminate sugary drinks and unhealthy food choices from school vending machines.
- Offer healthier choices for snacks at youth activities in the community, such as sports events and church or community socials.
- Work with school administration and the school board to include daily physical activity (at least 30 minutes) and provide developmentally appropriate activities allowing maximum participation and student activity time.
- Encourage a variety of sports and community recreation programs that require moderate and vigorous physical activity for a variety of physical activities.
- Obtain school support for maintaining healthy lifestyles.

Action! See IHS School Health Best Practice for ideas for creating a healthy school environment.

Team Notes:

Working Together with Your Community and Organization

Programs need to work on broader community and organizational support of the goals they are trying to achieve.

Organization Recommendations

1. Institute broad-based system and programmatic changes.

Why?

Health care systems will need to adequately address the increasing prevalence and incidence of youth at risk for, or with, type 2 diabetes. To do so, health care systems must continue broad-based, collaborative efforts to turn the tide of this public health crisis (IHS, 2007).

How to Implement the Key Recommendation

A. **Conduct a community needs** assessment to determine what resources are available for youth.

Action! See The Community Toolbox for information on conducting a community needs assessment: http://ctb.ku.edu/tools/EN/sub_section_main_1019.htm

B. **Pursue Tribal and grant funds to provide more resources and personnel** for type 2 diabetes prevention programs. Recruit the private sector to help promote awareness of overweight and type 2 diabetes and implement simple changes across a large population (e.g., conduct community-wide campaigns sponsored through community resources).

C. **Support policy and environmental changes** in clinics, schools, teen centers, and Tribal centers. For example, do not offer sugar-sweetened beverages (for example, soda pop) and unhealthy food items in these environments.

D. **Provide support (e.g., personnel, space, time, and money) for youth activities and interventions.**

E. **Develop partnerships between the health care system and community programs/organizations.**

F. **Conduct awareness campaigns and education programs** to disseminate information about type 2 diabetes prevention in youth.

G. **Provide training and continuing education** to health care providers and field health personnel.

H. **Increase efforts for early identification of youth at risk** of developing type 2 diabetes.

I. **Identify prevention of type 2 diabetes for youth as a key priority** in the health care organization's annual goals.

J. Expand Medicaid and State Children's Health Insurance Program (SCHIP) eligibility periods for children with type 2 diabetes. Access to care is key.

Team Notes:

PART 3 Appendices, Tools, and Resources

Appendix A. Supplemental Information

1. Importance of Youth and Type 2 Diabetes Prevention and Treatment

The incidence and prevalence of type 2 diabetes among youth is increasing. Most cases of diabetes among Native Americans are type 2 and associated with modifiable risk factors such as overweight and inactivity, making prevention an important goal. Youth with type 2 diabetes may experience metabolic factors associated with overweight and insulin resistance as well as diabetes-related complications at an early age and for many years. Prevention and treatment of type 2 diabetes in youth reduces the frequency and severity of metabolic factors and diabetes-related complications, and helps youth stay healthy. Research specific to youth, including the studies, is available and helping to clarify Best Practices for youth (SEARCH, TODAY, and HEALTHY).

Risk for Type 2 Diabetes in Youth:

- **Exposure to diabetes in the intrauterine environment** is associated with approximately 40% of type 2 diabetes in children between the ages of five and nineteen years (Dabelea et al., 2000).
- **More than 70% of people with prenatal exposure to type 2 diabetes develop it by the time they reach early adulthood**, that is, between the ages of 25 and 34 years (Dabelea et al., 2000).
- **Over the past three decades, the childhood obesity rate has more than doubled for preschool children between the ages of two and five years, and for adolescents between the ages of twelve and nineteen years.** The childhood obesity rate has more than tripled for children between the ages of six and eleven years. At present, approximately 9 million children over six years of age are considered obese, and 15% are considered at risk of becoming overweight (IOM, 2005; NHANES, 2004).

Prevalence of Overweight and Obesity in IHS Active Clinical Patients (IHS, HWFL, 2011):

Children and Youth (ages 2–19):

- 45% of children ages 2–5 are overweight or obese
- 25% of children ages 2–5 are obese
- 49% of children ages 6–11 are overweight or obese
- 31% of children ages 6–11 are obese
- 51% of children ages 12–19 are overweight or obese
- 31% of children ages 12–19 are obese

Source: Unpublished FY 2008 data from the IHS Clinical Reporting System (CRS) (2009 Update coming). For FY 2008 the Government Performance and Results Act (GPRA) user population was 1,256,963. In FY 2008, the active clinical population ages 2–74 was 837,545; this includes 520,986 adults ages 20–74, and 316,559 children ages 2–19. In FY 2008, 618,310 active clinical patients were screened for Body Mass Index, the measure used to determine overweight and obesity; this includes 429,809 adults age 20–74 and 188,501 children ages 2–19.

Incidence and Prevalence of Type 2 Diabetes in Youth:

- About 215,000 people younger than 20 years have diabetes (type 1 or type 2). This represents 0.26% of all people in this age group (CDC, 2011).
- American Indian youth have the highest prevalence of type 2 diabetes. In the 15-19 year age group, the prevalence for all U.S. American Indian populations is 4.9 per 1,000. <http://www.cdc.gov/diabetes/projects/cda2.htm>
- From 1990 to 2004, American Indian and Alaska Native adolescents between the ages of fifteen and nineteen years experienced a 128% increase in type 2 diabetes prevalence (Mayer-Davis et al., 2009).
- People with diabetes diagnosed before the age of 20 years have a life expectancy that is 15–27 years shorter than people without diabetes (Diabetes in America, 1995), although prospective data shows improvements in mortality for those diagnosed in more recent years (Mayer-Davis et al., 2009).

SEARCH for Diabetes in youth research findings for the communities studied include (CDC, 2011):

- During 2002–2005, 3,600 youth were newly diagnosed with type 2 diabetes annually.
- Among youth ages <10 years the rate of new cases was 0.4 per 100,000 for type 2 diabetes.
- Among youth ages 10 years and older, the rate of new cases was 8.5 per 100,000 for type 2 diabetes.
- Rates of type 2 diabetes were greater among youth ages 10–19 years than in younger children, with higher rates among U.S. minority populations than in non-Hispanic whites.
- For American Indian youth ages 10–19 years, the rate of new cases was greater for type 2 diabetes than type 1 diabetes.

2. The potential benefits to youth of implementing this best practice include:

- improvement in health-enhancing behaviors, including eating healthfully and being physically active
- prevention of overweight and obesity
- prevention of type 2 diabetes
- effective management of type 2 diabetes
- prevention of diabetes complications

There are no known potential risks of implementation of this Best Practice.

3. Sustaining a youth and type 2 diabetes prevention and treatment program

To reach program goals, programs must be in place for more than a few years and build each year on the previous year. Here are some helpful suggestions for sustaining the program:

- **Program planning:** When planning the program, start with realistic goals and build from year to year. Do not try to accomplish everything the first year. Identify short and long-term goals.
- **Resources:** Provide funding to continue diabetes prevention and treatment youth programs.
- **Environmental and policy factors:** These may include improving access to food and dealing with food insecurity issues; creating safe walking trails; providing health breaks during school; making sugary drinks unavailable at schools; making walking a community norm for families; creating indoor and outdoor recreation areas; working with schools, Tribes, and clinics to make policy changes; and establishing time for providers to do case management and other youth type 2 diabetes activities. Choose one or two and build from year to year.
- **Social and cultural factors:** These may include buying reuseable water containers for youth, serving water instead of Kool-Aid at Tribal feast days, and creating opportunities for program participants to continue participating through summer jobs or after school jobs. Choose one or two and build from year to year.
- **Capacity building:** Train staff and community leaders to continue program efforts.

Appendix B. Key Measures Example

Remember—this is an example! Apply this process to your community using your data.

Overweight and diabetes in youth is increasing in our community. We are concerned about the increasing number of youth who are overweight and have type 2 diabetes in our community.

Diabetes team takes action. Our diabetes team talked about addressing this problem. We thought about our community, resources, and data. We read the Youth and Type 2 Diabetes Prevention and Treatment Best Practice, and talked about the Key Recommendations.

Identified sources of data. Local data included:

- Community and school data on number of youth
- Diabetes Registry
- Audit data
- School data on screening for obesity
- RPMS data
 - o Data included:
 - 40% of youth in the community had been screened for overweight/obesity.
 - 10% of those screened had been tested for pre-diabetes/diabetes.

There were no data on healthy eating and healthy activity behaviors of youth.

Selected suitable Best Practice. After thinking carefully about our goals and resources, and reviewing data, we decided the Youth and Type 2 Diabetes Prevention and Treatment Best Practice was a good fit for us. We chose to work on two of the Key Recommendations: screening youth for overweight/obesity and promoting healthy eating and physical activity guidelines.

Identified target population. We decided to start implementing this Best Practice with youth ages 6–12.

Identified program goals:

- To increase the number of youth who are screened for overweight/obesity and receive appropriate intervention
- To increase the number of youth who engage in healthy eating and physical activity behaviors

Identified SMART objectives based on our resources and data:

- The percentage of youth ages 6–12 who are screened for overweight/obesity will increase from 40% to 55% during the next 12 months.
- 90% of youth ages 6–12 with a BMI greater than the 85th percentile will be referred for diagnostic testing and assessment during the next 12 months.
- 50% of youth ages 6–12 will demonstrate healthy eating and physical activity behaviors based on self-reported survey during the next 12 months.

Selected Key Measures. We chose the corresponding Key Measures for these objectives and two Key Recommendations. Data will be collected and reviewed at baseline and mid-year.

Selected Key Measures

A. Measure	B. <u>Baseline</u> or beginning value and date (collected prior to starting activities)	C. Most recent value and date (if applicable)	D. Data source (where did these numbers come from)
1.* Percent of youth screened for overweight /obesity	40% as of 12/31/2010	50% as of 3/15/2011	RPMS–DM Audit
2.* Percent of youth with a BMI screening result above the 85th percentile that have been tested for pre-diabetes/diabetes	10% as of 12/31/2010	9% as of 3/15/2011	RPMS–DM Audit
3.* Percent of youth in the target population with an increase in both healthy eating and physical activity behaviors	0 as of 12/31/2010	50% as of 3/15/2011	RPMS–DM Audit

* Required Key Measure

Appendix C. Improving Youth and Type 2 Diabetes Prevention and Treatment Programs Example

Remember—this is an example! Ask these questions in your community, thinking about your local needs, resources, and tracking systems.

There are four fundamental questions to ask as you plan and implement your youth and type 2 diabetes prevention and treatment program. These questions, and sample answers, are:

1. Who is your target population for this Best Practice?

- Youth in our community ages 2 to 18.

Note! Consider using a subset of this population that is more realistic for your community based on your data and resources. Implementing recommendations with a smaller target population, such as pre-schoolers, elementary age youth, preteens, or teens, may be more achievable, especially when first starting your program.

2. What are you trying to do by implementing this Best practice?

- We want to reduce the number of youth in our community who are overweight/obese and who develop type 2 diabetes.

3. How will you know if what you do makes things better?

- We will reduce the percentage of youth ages 2 to 18 who have a BMI greater than the 85th percentile.
- We will reduce the new cases of type 2 diabetes in youth ages 2–18.

4. What can you do to make things better?

- We can make things better by:
 - screening youth for overweight/obesity
 - testing for pre-diabetes/diabetes in at-risk youth
 - promoting healthy eating and physical activity guidelines for youth
 - developing and implementing education and prevention/treatment plans for overweight or obese youth and youth with pre-diabetes or diabetes.
 - engaging families in the youth program

Appendix D. Considerations for Educators When Providing Information About Healthy Weight

Source: IHS *Youth Staying Healthy: A Diabetes Prevention Curriculum for Youth Ages 8-12*

Over the past three decades, the childhood obesity rate has more than tripled for children between the ages of six and eleven years, and more than doubled for adolescents between the ages of twelve and nineteen years. It is postulated that reduction of weight and insulin resistance will reduce the risk for type 2 diabetes in children and adolescents. Studies that will determine what strategies work best for children and adolescents are under way.

Staying at a healthy weight needs to be part of education offered to help youth and their families reduce their risk for diabetes. There are several considerations the educator needs to take into account in order to make this education appropriate and effective:

- The height, shape, and size of the body vary among people.
- Genetics and environmental factors both play a role in determining body stature.
- Healthy weights are described in ranges. Each person has a weight range that is healthy for him/her.
- Children are growing physically and emotionally.
- All children experience growth spurts during adolescence. Before age 11 or 12, girls may get taller and heavier, and have more fat around their hips, waist, and breasts. Boys experience their growth spurt from 10 to 16 years of age. They will get taller, gain weight, have broader shoulders, and develop muscles.
- Pre-teens (ages 10–12) need to be reassured that some of their weight gain is a normal part of puberty.
- Pre-teens may become sensitive about their appearance, particularly as they begin comparing themselves to peers and images in the media.
- Children and their families should be encouraged to accept themselves and their body shape.
- It is important that children know others love and accept them no matter how much they weigh.
- Communication about a child's weight status to parents needs to be conveyed carefully and with sensitivity.
- When counseling parents and children, use the term 'overweight' and avoid the term 'obese.'
- Labeling children as 'obese' or 'overweight' may lower the child's self-esteem. Parents worried about their child becoming 'obese' may think that restricting food will keep them from getting 'fat.'
- Diets, particularly low-calorie diets, may not give children the calories and nutrition they need to grow and may be harmful.
- Restricting food intake can make a child feel insecure about food and cause them to eat more, gain unhealthy amounts of weight, and/or develop unhealthy eating habits that can lead to eating disorders.

- A pediatrician or primary care provider is the best person to determine if a child is overweight. Most doctors use special growth charts to follow a child's growth pattern and determine if a child is underweight, overweight, or within a healthy weight range.
- Body mass index (BMI) is a standard developed to determine if a person is at risk for chronic diseases. It is calculated by dividing weight in kilograms by height in meters squared.
- BMI is age and gender specific for children. One measurement plotted on a growth chart can be used to screen children for nutritional risk, but it does not provide adequate information to determine the child's growth pattern. When plotted correctly, a series of accurate weights and measurements of stature offer important information about a child's growth pattern over the years. Children tend to grow predictably and follow a specific percentile on the growth chart. If a recent measurement shows a rapid shift up or down in any growth pattern, then this is an indicator that further assessment may be needed
- Generally, the goal for children who are overweight, or have accelerated weight gain, is to slow down the rate of weight gain while allowing for normal growth and development, giving the body a chance to catch up with weight as it grows in height.
- Unhealthy weight gain can be prevented with small changes in healthy eating behaviors and by increasing physical activity.
- Make diabetes prevention education part of a comprehensive program that includes structured nutrition education, physical activity, medical screening, intervention, and psychological support targeted at youth at risk for diabetes.
- Overweight youth need to be referred to appropriate health care providers for diagnostic testing for diabetes, as indicated, a medical evaluation for other complications associated with childhood overweight, necessary treatment for high blood pressure and dyslipidemia, and counseling on nutrition, physical activity, and staying at a healthy weight.

Sources:

- BodyWorks: <http://www.womenshealth.gov/bodyworks/>
- Centers for Disease Control and Prevention (CDC), *Use and Interpretation of the CDC Growth Charts*: http://www.cdc.gov/nccdphp/dnpa/growthcharts/guide_intro.htm
- Indian Health Services Best Practices: Youth and Type 2 Diabetes (2009) <http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm>
- Ellyn Satter, *Your Child's Weight: Helping Without Harming*: <http://www.ellynsatter.com/physical-products-books-your-childs-weight-helping-without-harming-p-790.html>

Appendix E. Steps for Calculating and Interpreting BMI Using the BMI Percentile Calculator

1. Obtain accurate height and weight measurements.
2. Calculate the BMI and percentile using the *Child and Teen BMI Calculator*. <http://apps.nccd.cdc.gov/dnpabmi>. The BMI number is calculated using standard formulas.
3. Review the calculated BMI-for-age percentile and results.
 - The BMI-for-age percentile is used to interpret the BMI number because BMI is both age- and sex-specific for children and teens. These criteria are different from those used to interpret BMI for adults, which does not take into account age or sex. Age and sex are considered for children and teens for two reasons:
 - The amount of body fat changes with age (BMI for children and teens is often referred to as *BMI-for-age*).
 - The amount of body fat differs between girls and boys.
 - The CDC BMI-for-age growth charts for girls and boys take into account these differences and allow translation of a BMI number into a percentile for a child's or teen's sex and age.
 - After BMI is calculated for children and teens, the BMI number is plotted on the CDC BMI-for-age growth charts (for either girls or boys) to obtain a percentile ranking. Percentiles are the most commonly used indicator to assess the size and growth patterns of individual children in the United States. The percentile indicates the relative position of the child's BMI number among children of the same sex and age. The growth charts show the weight status categories used with children and teens (underweight, healthy weight, overweight, and obese).
4. Find the weight status category for the calculated BMI-for-age percentile as shown in the following table. These categories are based on expert committee recommendations.

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

Appendix F. Sample Educational Tools for Healthy Eating and Physical Activity

5-2-1-0 Campaign

Many national and state initiatives use the 5-2-1-0 slogan for healthy behaviors:

- 5 fruits and/or vegetables every day
- 2 hours or less screen-time each day
- 1 hour or more physical activity every day
- 0 sugary drinks

Sources include:

- Keep ME Healthy 5-2-1-0 Power Up Project
- 5-2-1-0 Healthy NH
- Additional sources can be found by searching the Internet.

Family Calendar

This visual assists youth and their families with creating family meal times and family physical activity times.

Source: *Youth Staying Healthy: A Diabetes Prevention Curriculum for Youth Ages 8-12*, <http://www.ihs.gov/>

Go, Slow, and Whoa Foods

Provides an easy way to learn about which foods are lower in fat and calories by thinking in terms of GO, SLOW, and WHOA.

Source: <http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/eat-right/choosing-foods.htm>

Helping Hands

Helping Hands and Everyday Objects visuals can be used as serving size guides.

Source: *Youth Staying Healthy: A Diabetes Prevention Curriculum for Youth Ages 8-12*, <http://www.ihs.gov/>

Hunger-Fullness Scales

A Hunger-Fullness Scale is a tool to help a person pay attention to his/her body messages for hunger and fullness. This helps him/her eat because of body hunger and stop eating when he/she is comfortably full.

Source: *Youth Staying Healthy: A Diabetes Prevention Curriculum for Youth Ages 8-12*, <http://www.ihs.gov/>

Kid's Activity Pyramid

This visual teaches kids about the importance of physical activity through colorful, ethnically diverse graphics, and simple language.

Sources:

- Park Nicollet Health Source: <http://www.healthsource.org/> and <http://www.parknicollet.com/>
- Additional sources can be found by searching the internet.

Just Move It

Just Move It is a national campaign to promote physical activity for American Indians and Alaska Natives.

Source: <http://www.justmoveit.org/>

Let's Move!

Let's Move! is a comprehensive initiative dedicated to solving the challenge of childhood obesity within a generation. Combining comprehensive strategies with common sense, Let's Move! is about putting children on the path to a healthy future during their earliest months and years, giving parents helpful information and fostering environments that support healthy choices, providing healthier foods in our schools, ensuring that every family has access to healthy, affordable food, and helping kids become more physically active.

Source: <http://www.letsmove.gov/>

MyPyramid for Kids

MyPyramid for Kids is a child-friendly version of the MyPyramid Food Guidance System. It was developed to help motivate children ages 6–11 years to make healthy food choices and be physically active every day. The MyPyramid for Kids messages are the same as MyPyramid but are written in simpler language for children. MyPyramid for Kids includes illustrations of children involved in a variety of physical activities and shows healthy foods from each food group that will appeal to children. The graphic, slogan, and messages of MyPyramid for Kids were developed for and tested with elementary school-aged children.

Source: <http://www.mypyramid.gov/>

Appendix G. Resources for Management of Type 2 Diabetes in Youth

American Association of Diabetes Educators

Website: <http://www.diabeteseducator.org/>

American Diabetes Association

Website: <http://www.diabetes.org>

Telephone: 800-342-2383

American Dietetic Association

Website: <http://www.eatright.org/Public/content.aspx?id=206>

Telephone: 800-877-1600

American Heart Association

Website: <http://www.americanheart.org>

Telephone: 800-242-8721

CDC Division of Diabetes Translation

Website: <http://www.CDC.gov/diabetes/>

Telephone: 800-232-4636

CDC growth charts

Website: http://www.CDC.gov/nchs/about/major/nhanes/growth_charts/clinical_charts.htm

<http://www.cdc.gov/growthcharts/>

Juvenile Diabetes Research Foundation International

Website: <http://www.jdrf.org>

Telephone: 800-533-2873

National Diabetes Education Program

Website: <http://www.ndep.NIH.gov/diabetes/youth/youth.htm>

Telephone: 800-438-5383

National Institute of Diabetes and Digestive and Kidney Diseases

Website: <http://diabetes.niddk.NIH.gov/>

Telephone: 800-860-8747

Tools and Resources

Web-based Resources

American Alliance for Health, Physical Education, Recreation, and Dance The American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD) is the largest organization of professionals supporting and assisting those involved in physical education, leisure, fitness, dance, health promotion, and education and all specialties related to achieving a healthy lifestyle.

<http://www.aahperd.org/>

American Association of Diabetes Educators This site provides diabetes-related resources for health care professionals as well as the general public.

<http://www.diabeteseducator.org/About>

American Diabetes Association This site offers information on diabetes for educators and the general public. <http://www.diabetes.org/>

Captive Kids: A Report on Commercial Pressures on Kids at School

<http://www.consumersunion.org/other/captivekids/index.htm>

Fruits and Veggies: More Matters The goal of this program is to educate adults and youth about creative ways to increase consumption of fruits and vegetables.

<http://www.fruitsandveggiesmorematters.org/>

Healthy Kids; Healthy Weight This new publication represents a collaboration between the Michigan Department of Community Health and the Michigan Department of Education in a joint effort to help families understand the importance of health weight in children.

<http://www.emc.cmich.edu/healthyweight/default.htm>

Healthy Weight for Life, IHS <http://www.ihs.gov/healthyweight/>

Two companion action guides: Actions for Health Care Team Members and Leaders, 2011

http://www.ihs.gov/healthyweight/index.cfm?module=dsp_hw_teams

Actions for Communities, Individuals, and Families, 2011

http://www.ihs.gov/healthyweight/documents/HW4L_Communities.pdf

IHS Division of Diabetes Treatment and Prevention An online training course on effective program planning and evaluation [Developed July 2009]. Creating Strong Diabetes Programs: Plan a Trip to Success.

<http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=trainingBasicsCreating>

IHS Division of Diabetes Treatment and Prevention A workbook (with online training course) on effective program planning and evaluation [Developed July 2009]. Creating Strong Diabetes Programs: Plan a Trip to Success.

<http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Training/WebBased/Basics/Creating/Workbook.pdf>

IHS Division of Diabetes Treatment and Prevention This website provides useful information on diabetes and diabetes programs for American Indians and Alaska Natives, including information on how to obtain copies of the Eagle Books by Georgia Perez.

<http://www.ihs.gov/MedicalPrograms/Diabetes/>

IHS Division of Diabetes Treatment and Prevention (DDTP) Youth Being Healthy: A Type 2 Diabetes Curriculum for Teens. This curriculum is available on the Division's website and can be ordered from the catalog.

<http://www.ihs.gov/MedicalPrograms/Diabetes/>

IHS Division of Diabetes Treatment and Prevention Promoting a Healthy Weight in Children and Youth 2008. This report outlines clinical strategies on five childhood obesity prevention and treatment recommendations for health care professionals in IHS, Tribal, and urban settings.

http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/ClinicalGuidelines/Promoting_Healthy_Weight_1208.pdf

IHS National Nutrition and Dietetics Training Program The IHS National Nutrition and Dietetics Training Program provides a wide range of nutrition training tailored to IHS, Tribal, and urban Indian health program professionals and paraprofessionals.

<http://www.ihs.gov/medicalprograms/nutrition/>

National Diabetes Education Program

Resources for Children and Adolescents:

<http://www.ndep.nih.gov/diabetes/youth/youth.htm>

<http://www.ndep.nih.gov>

<http://www.cdc.gov/diabetes/ndep>

<http://www.diabetesatwork.org>

<http://www.betterdiabetescare.nih.gov>

<http://www.YourDiabetesInfo.org>

The National Diabetes Education Program brings together public and private partners to improve treatment and outcomes for people with diabetes, promotes early diagnosis, and prevents the onset of type 2 diabetes. It promotes awareness and education activities and quality care. The website provides tools for educating health care providers and patients.

National Diabetes Information Clearinghouse <http://diabetes.niddk.nih.gov>
800-860-8747

U.S. Department of Agriculture *MyPlate* Icon– think about building a healthier plate at mealtimes. Use this interactive site to learn about food groups, create a personalized plan, analyze your diet, get healthy eating tips and more! Appropriate for ages two and up.

<http://www.choosemyplate.gov/>

Nutrition for Kids This website provides information, activities, newsletters, stickers, handouts, and links—all geared to teaching nutrition to kids. <http://nutritionforkids.com/kidactivities.htm>

Physical Activity Kit (PAK) for AI/AN Communities Training

This training is intended for practitioners and facilitators of health promotion in American Indian and Alaska Native communities to learn how to implement, evaluate, and disseminate the evidence-based physical activity interventions in PAK for American Indian and Alaska Native communities. The training explains and demonstrates several physical activity programs developed by the University of New Mexico Prevention Research Center, such as Pathways (Prevention of Obesity in American Indian School Children), which includes modified American Indian games, exercise breaks, mountain pathways challenge, and a race, Healthy Body Awareness, and Native American Dance Overview. The programs cover strength-building, flexibility, and aerobics and are geared for all ages across the lifespan (such as, Head Start youth, elementary through high school youth, young adults, adults, older adults, and families). <http://www.cdc.gov/prc/training/practitioners/physical-activity-kit-facilitator-training.htm>

PE4Life PE4life inspires active, healthy living by advancing the development of quality, daily physical education programs for all children. <http://www.pe4life.org/>

PE Central PE Central provides health and physical education to teachers, parents, and students. Their goal is to provide the latest information about developmentally appropriate physical education programs for children and youth. To combat the high obesity rate among youth, they offer programs to help students log their physical activity and pedometer steps. <http://www.pecentral.org/>

IT'S MY LIFE It's My Life, funded by the Corporation for Public Broadcasting, is a site for kids and teens that includes a Food Smarts section. <http://pbskids.org/itsmylife/body/foodsmarts/index.html>

Smart-Mouth.org This website uses games to teach middle-school-aged children how the food environment (e.g., advertising, portion sizes, and school vending choices) influences their food choices. Kids can see how their favorite restaurant foods stack up, play 'true or false' with a food industry spokesman, and 'bite back' by asking food companies and government officials to support healthy eating. <http://www.cspinet.org/smartmouth/index1.html>

Sports, Play and Active Recreation for Kids (SPARK) SPARK is physical activity curricula for early childhood, elementary, middle school, and high school age youth. Adults must receive training on how to provide the curricula in their community. <http://www.sparkpe.org/about.jsp>

The Texas Pediatric Society Obesity Committee This updated version of the Obesity Toolkit was released in 2008. The Texas Pediatric Society Obesity Committee develops and disseminates practical guidelines to aid pediatric practitioners in the prevention, early recognition, and clinical care of children and adolescents who are overweight or obese, with or without comorbid conditions. <http://www.txpeds.org/texas-pediatric-society-obesity-toolkit>

World Health Organization: BMI Charts This website provides BMI charts for children from birth to five years. http://www.who.int/childgrowth/standards/bmi_for_age/en/index.html

Examples of Current Best Practice Programs

Indian Health Care Resource Center of Tulsa

550 S. Peoria

Tulsa, OK 74120

Contact: Nancy O'Banion, MS, Director, Health Education & Wellness

Phone: 918-382-2220

Email: <http://www.ihcrc.org/>

The Indian Health Care Resource Center of Tulsa provides school-based programs, including:

- CATCH (Coordinated Approach to Child Health) implemented in twelve Tulsa elementary schools in three-year project
- After school programs at two school sites, including at least 45 minutes of physical activity plus nutrition lessons
- CATCH training programs for schools and Tribes
- HEALTHY training annually for schools and Tribes (Harnessing Experiential & Active Learning for Today's Healthy Youth)
- Summer camp programs that focus on physical activity, nutrition, and diabetes prevention.

Muscogee (Creek) Nation Diabetes Program

800 Forest Avenue

Eufala, OK 74432

Contact: Kimberlee Little MS, Exercise Programs Coordinator

Phone: 918-637-9684

Email: kimberlee.little@creekhealth.org

The Muscogee (Creek) Nation Diabetes Program offers a variety of community health and wellness programs focusing on diabetes prevention and management, including:

- School-based Programs
 - School Wellness Policy
 - After School Program Jump Rope Program
- Diabetes Prevention Youth Camps

Navajo Nation Special Diabetes Project (NNSDP) and Kayenta Community School (KCS)

<http://www.nnsdp.org/>

Contact: Marlene Valentine, Health Education Technician

Navajo Nation Special Diabetes Project

P.O. Box 2269

Kayenta, AZ 86033

John Axline, Counseling Technician

Kayenta Community School, B.I.E.

P.O. Box 188

Kayenta, AZ 86033

SPARKS Program

This is an example of a Tribal program working with the local school to benefit children's health and diabetes awareness among school age children.

Northern Navajo Medical Center

P.O. Box 160

Shiprock, NM

Contacts: Susan R. Jones MS, RD, LD, CNSD, CPS; Miranda Oshida, RD, Supervisory Dietitian; Kari Wato, RD

Phone: 505-368-6209

Email: susan.jones@ihs.gov

The Northern Navajo Medical Center provides a Pediatric Obesity Clinic that offers a multidisciplinary team approach to helping children who are over the 95% BMI for growth using evidence-based guidelines.

Tohono O'odham Nation

Sells, AZ

Contact: Marlene Saraficio, Public Health Educator, San Simon Health Center

Phone: 520-362-7050

Email: marlene.saraficio@ihs.gov

Taking Ownership Wellness Coalition (TOWC)

- Established in 2008 to address childhood obesity among the Tohono O'odham Nation.
- Goals include increasing physical activity and nutrition education, decreasing obesity and diabetes, and developing traditionally-appropriate projects.
- Supports Coordinated School Health (CSH). In 2008, the Tohono O'odham Nation Legislative Council passed a Resolution to support the adoption of the Comprehensive School and Wellness Proposal for all schools on the Tohono O'odham Nation grades K-12. CSH includes:
 - Everyone Be Healthy and Well A high school conference for students and parents addressing fitness, nutrition, stress, suicide, historical trauma, and other teen health topics.
 - Just Move It—Putting Youth Best Foot Forward into Wellness This national physical activity campaign is implemented locally through community partnerships and fun fitness activities. It uses an intergenerational approach connecting individuals, families, elders, employees, and health care providers. Team fitness challenges are ongoing to increase physical activity and decrease weight.

Additional Contacts

Contacting other people involved in diabetes and youth prevention and treatment is important because they can help you get started. Your peers at other health care organizations can share their expertise, materials, and ideas, and can also tell you what has worked for them and what has not. This can help you avoid reinventing the wheel. Persons or programs that sites might contact for further ideas and assistance include:

Area Diabetes Consultants. Contact information for Area Diabetes Consultants can be viewed at:

<http://www.ihs.gov/MedicalPrograms/diabetes/index.cfm?module=peopleADCDirectory>

Contact the **IHS Division of Diabetes Treatment and Prevention** for ideas. Available at:

<http://www.ihs.gov/medicalprograms/diabetes/index.cfm?module=peopleDDTP>

PART 4 References

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