

Indian Health Diabetes Best Practices:
Youth and Type 2 Diabetes



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Indian Health Service
Division of Diabetes Treatment and Prevention
5300 Homestead Road, NE
Albuquerque, New Mexico 87110
(505) 248-4182

www.ihs.gov/medicalprograms/diabetes

Indian Health Diabetes Best Practice: Youth and Type 2 Diabetes

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What is a youth and type 2 diabetes program?

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

Why is addressing type 2 diabetes in youth important?

Preventing type 2 diabetes and treating overweight are critical to the future health of American Indians and Alaska Natives. Although the number of youth with type 2 diabetes is low, the prevalence of diabetes among youth is growing at an alarming rate. Likewise, the number of youth at risk for developing type 2 diabetes is climbing. Youth who develop type 2 diabetes will experience more years of burden from type 2 diabetes and a higher probability of developing serious type 2 diabetes-related complications. Consider these facts:

- From 1990 to 2004, American Indian and Alaska Native adolescents between the ages of 15 and 19 years experienced a 128% increase in type 2 diabetes prevalence (IHS, 2006).
- Exposure to diabetes in the intrauterine environment is associated with approximately 40% of type 2 diabetes in children between the ages of 5 and 19 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 (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 2 and 5 years and adolescents between the ages of 12 and 19 years. The childhood obesity rate has *more than tripled* for children between the ages of 6 and 11 years. At present, approximately nine million children over 6 years of age are considered obese, and 15% are considered at risk of becoming overweight (IOM, 2005; NHANES, 2004).

The good news is that youth can reduce their risk for type 2 diabetes, and effective treatment for those who already have diabetes is available. New research studies also offer hope in finding more ways to help prevent and manage type 2 diabetes in youth.

Best practices for youth and type 2 diabetes

The best practice for youth and type 2 diabetes* describes the best methods for:

- Promoting breastfeeding of infants for at least two months.
- Reducing *in utero* exposure to elevated blood sugar levels.
- Establishing programs to increase physical activity and improve diet early in life.
- Finding cases early, making diagnoses, and making appropriate referrals.
- Treating youth with type 2 diabetes.

Table 1 summarizes the best practices for youth and type 2 diabetes.

*The prevalence of type 2 diabetes in youth is still relatively low. Therefore, the main focus of this best practice is to provide methods for community-based diabetes prevention efforts. Because youth and schools are so intertwined, please refer to the Indian Health Diabetes Best Practice on school health for more information about working with schools.

Table 1. Best practices for youth and type 2 diabetes.

Provider Recommendations	Best Practices
<p>1. Promote breastfeeding of infants for at least two months</p>	<p>Why?</p> <p>Breastfeeding a child for at least two months has been associated with an approximate 50% reduction in their risk of developing type 2 diabetes (Pettit <i>et al.</i>, 1997).</p> <p>How?</p> <ul style="list-style-type: none"> - Establish a breastfeeding protocol that recommends exclusive breastfeeding for the first six months of life, with a goal of 12 months of breastfeeding. Communicate this protocol with all staff and enlist the support of community health workers and public health nurses. - Refer mothers to breastfeeding support groups. - Post positive messages about breastfeeding in the clinic and appropriate community locations (e.g., Women, Infants, and Children (WIC) offices). - Please refer to the Indian Health Diabetes Best Practice on breastfeeding.
<p>2. Reduce <i>in utero</i> exposure to elevated blood sugar levels</p>	<p>Why?</p> <p>Exposure to diabetes in the intrauterine environment places the fetus at increased risk of future overweight and type 2 diabetes. It also accounts for approximately 40% of type 2 diabetes in children between the ages of 5 and 19 years. Furthermore, more than 70% of people who had prenatal exposure to type 2 diabetes will develop it between the ages of 25 and 34 years of age (Dabelea <i>et al.</i>, 2000; Pettit and Knowler, 1998; Pettit <i>et al.</i>, 1993).</p> <p>How?</p> <ul style="list-style-type: none"> - Establish and maintain normal blood sugar levels in women who have diabetes during pregnancy. - Target women of child-bearing age with diabetes prevention activities to help reduce diabetes risk during pregnancy. - Please refer to the Indian Health Diabetes Best Practice on pregnancy and diabetes.

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Table 1. Best practices for youth and type 2 diabetes. (continued)

Provider Recommendations	Best Practices
<p>3. Establish programs to increase physical activity and improve diet early in life</p>	<p>Why?</p> <p>There is a lack of primary prevention studies in youth. Although the available evidence on primary prevention is for adults, it appears reasonable for youth. Evidence from several studies suggests that methods to increase physical activity and improve diet are essential elements of primary prevention. A multi-center, population-based prevention study, called the STOPP T2DM (Study To Treat or Prevent Pediatric Type 2 Diabetes Mellitus), is currently underway and may provide useful information on the prevention of type 2 diabetes. (To learn more about the STOPP T2DM study, please visit the websites: www.todaystudy.org and www.niddk.nih.gov/fund/ancillary-studies/studies.htm.)</p> <p>How?</p> <p>The following approaches have been proven to be effective at getting youth to be more active and improve nutritional intake:</p> <ul style="list-style-type: none"> - Behavioral approaches: <ul style="list-style-type: none"> • Goal setting and self-monitoring of progress toward goals. • Building social support for new behaviors. • Behavioral reinforcement through self-reward and positive self-talk. • Structured problem solving to maintain behavior change. • Preventing relapses of sedentary behavior. - Community-wide campaigns. - Environmental and policy changes, such as providing safe playgrounds, and working with schools and restaurants to offer appropriate portion sizes and healthier food choices. - School physical education curricula that include mandatory physical activity classes that are at least 30 minutes every day and provide developmentally appropriate activities that provide maximum participation and student activity time. - 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 for each student. - Promoting sports and community recreation programs that require more physical activity (e.g., substituting soccer for softball).

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Table 1. Best practices for youth and type 2 diabetes. (continued)

Provider Recommendations	Best Practices
<p>3. Establish programs to increase physical activity and improve diet early in life</p> <p>(continued)</p>	<ul style="list-style-type: none"> – Providing social support in community settings to increase physical activity (e.g., buddy systems, contracts to complete specific levels of physical activity, and walking groups). – Eliminating sugary drinks and unhealthy food choices from school vending machines. – Obtaining school support for maintaining healthy lifestyles. School health curricula should include nutrition fact label reading and making better choices, such as choosing low-calorie, high nutrition foods in appropriate portions for school meals and snacks.
<p>4. Find cases early, make diagnoses, and make appropriate referrals</p>	<p>Why?</p> <p>Early case finding and diagnosis of youth at risk of developing type 2 diabetes or with 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).</p> <p>How?</p> <ul style="list-style-type: none"> – Include the family or parents as a key part of type 2 diabetes care; this is essential. – Identify the parent’s history of type 2 diabetes and co-morbid problems. Diagnose the parents with unknown type 2 diabetes if indicated. – Establish programs to encourage life-long healthy habits (e.g., physical activity and nutrition habits) to prevent overweight and type 2 diabetes. – Identify overweight infants using the weight-for-length ratio, and consider youth who are above the 95th percentile as possibly overweight. Use the World Health Organization (WHO) growth and body mass index (BMI) grids, which plot BMI starting at six months of age. – Use the American Diabetes Association criteria to determine if overweight youth who have entered puberty (or who are older than 10 years of age) are considered <i>at risk of developing type 2 diabetes</i>. Youth are at risk if they meet two of the following criteria: <ul style="list-style-type: none"> • Family history of type 2 diabetes in a first- or second-degree relative. • Race or ethnicity is American Indian, Alaska Native, African American, Hispanic, or Asian/Pacific Islander. • Presence of a condition associated with insulin resistance (e.g., impaired glucose tolerance (IGT), acanthosis nigricans, high blood pressure, dyslipidemia, or polycystic ovarian syndrome).

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Table 1. Best practices for youth and type 2 diabetes. (continued)

Provider Recommendations	Best Practices
<p>4. Find cases early, make diagnoses, and make appropriate referrals (continued)</p>	<ul style="list-style-type: none"> - Include BMI calculations in all health supervision visits for children from the ages of 2 to 20 years. Use growth charts from the Centers for Disease Control and Prevention (CDC) or WHO: <ul style="list-style-type: none"> • The CDC growth charts for weight-for-length reflect body weight relative to length. This is an indicator used to classify infants and young children as overweight or underweight. The weight-for-length charts can be used to plot from 77 to 121 centimeters. A weight-for-length ratio greater than 95th percentile is considered overweight. For detailed information on the CDC growth charts, see their instruction guide at www.cdc.gov/growthcharts/. • The WHO released the new international Child Growth Standards in April 2006. For more information, visit the website: www.who.int/childgrowth/en. • The U.S. Department of Health and Human Services and the American Academy of Pediatrics will convene an expert panel in June 2006 to consider using the new WHO growth charts versus the CDC growth charts. The panel will compare the 2000 CDC growth charts to the new WHO charts, and examine differences in how the two growth charts assess U.S. children. Guidance will be developed for the appropriate use of these growth charts for monitoring growth within the U.S. population. - Determine if youth are <i>at risk for overweight</i> using the following: <ul style="list-style-type: none"> • BMI between the 85th and 94th percentiles for age and sex. • Weight-for-height ratio between the 85th and 94th percentiles. - Determine if youth <i>are overweight</i> using the following definitions: <ul style="list-style-type: none"> • BMI greater than the 95th percentile for age and sex. • Weight-for-height ratio greater than the 95th percentile. • Weight greater than 20% of the ideal weight for height. - Note that the term “obese” has not been defined for children and is not recommended for describing children who are overweight or at risk for overweight. Communication about the child’s weight status to parents should be conveyed carefully and with sensitivity to avoid the stigmatization of obesity. - Refer overweight youth to appropriate health care providers for: (1) diagnostic testing for diabetes, as indicated; (2) a medical evaluation for other complications associated with childhood overweight; (3) needed treatment for high blood pressure and dyslipidemia; and (4) counseling on nutrition, weight control, and physical activity.

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Table 1. Best practices for youth and type 2 diabetes. (continued)

Provider Recommendations	Best Practices
<p>4. Find cases early, make diagnoses, and make appropriate referrals (continued)</p>	<ul style="list-style-type: none"> – Encourage all youth and their families to limit consumption of sweetened beverages and reduce television viewing or other screen time. – Provide tip sheets that promote physical activity and healthy eating habits. – Establish new or enhance existing partnerships and collaborations with programs, such as WIC and the U.S. Department of Agriculture Food Distribution Program.
<p>5. Treat youth with type 2 diabetes</p> <p>(Table 1 continued on next page)</p>	<p>Why?</p> <p>Clinical trials, such as the TODAY study (Treatment Options for Type 2 Diabetes in Adolescents and Youth), may provide insight into treating youth with type 2 diabetes. However, findings from adult studies, such as the UKPDS (United Kingdom Prospective Diabetes Study), have been extrapolated to youth. For example, the UKPDS found that treating type 2 diabetes to achieve good blood sugar and blood pressure control were essential to preventing microvascular and macrovascular complications. (Microvascular complications include nerve damage (i.e., neuropathy), kidney disease (i.e., nephropathy), and vision disorders (e.g., retinopathy, glaucoma, cataract, and corneal disease). Macrovascular complications include heart disease, stroke, and peripheral vascular disease. Peripheral vascular disease can lead to ulcers, gangrene, and amputation.)</p> <p>How?</p> <ul style="list-style-type: none"> – Review the American Academy of Pediatrics treatment recommendations for youth with type 2 diabetes (Gahagan <i>et al.</i>, 2003). Available online at: http://aappolicy.aappublications.org/cgi/content/full/pediatrics;112/4/e328. – Establish a clinical diagnosis of type 2 diabetes: <ul style="list-style-type: none"> • Casual or random plasma glucose greater than or equal to 200 mg/dl plus symptoms. • Fasting plasma glucose greater than or equal to 126 mg/dl. • Two-hour glucose values greater than or equal to 200 mg/dl on a oral glucose tolerance test (OGTT). For individuals weighing more than 43 kg (94.6 pounds), use a maximum glucose dose of 75 grams for the OGTT. For individuals weighing less than or equal to 43 kg (i.e., 94.6 pounds), use a dose of glucose equal to 1.75 grams of glucose per kilogram of body weight. • In the absence of marked hyperglycemia with decompensation, these criteria should be confirmed by repeat testing on a different day. The OGTT is not recommended for routine clinical use (Silverstein and Rosenbloom, 2000).

Table 1. Best practices for youth and type 2 diabetes. (continued)

Provider Recommendations	Best Practices
<p>5. Treat youth with type 2 diabetes (continued)</p>	<ul style="list-style-type: none"> - Obtain a complete medical history and psychosocial assessment, including a focus on: <ul style="list-style-type: none"> • Emotional health. • Eating disorders. • Alcohol, tobacco, and drug use. • Family support. - Decrease cardiovascular risk factors by controlling high blood pressure and dyslipidemia, stabilizing weight through diet modification, increasing physical activity, decreasing sedentary behaviors such as TV and video viewing, and discouraging use of tobacco products. - Achieve overall improvement in child’s physical and emotional well-being. - Conduct a complete physical exam including: <ul style="list-style-type: none"> • Plotting weight and height on a growth chart using BMI. (Note: A new BMI percentile wheel for youth is in production and may be available soon for clinical use. Contact the Indian Health Service (IHS) Division of Diabetes Treatment and Prevention for further information.) • Measuring weight at each visit and height twice a year. - Measuring blood pressure at each visit. The goal of blood pressure is less than 90th percentile based on height and weight standards (Gahagan <i>et al.</i>, 2003). - Evaluate children who have thickened and hyperpigmented skin, especially on the back of the neck, the underarms, and the groin, for acanthosis nigricans. Acanthosis nigricans often correlates with high BMI and insulin resistance. Insulin resistance may improve as weight decreases, and resolving acanthosis nigricans may be a useful marker for decreasing insulin resistance. - Provide primary care providers with an obesity toolkit, such as the Texas Pediatric Society Child Obesity Toolkit, which is simple to use and provides valuable clinical tools. - Conduct a foot exam at each visit. Use 5.07 Semmes-Weinstein monofilament to assess protective sensation on an annual basis. - Conduct a dilated eye exam at diagnosis and annually.

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Table 1. Best practices for youth and type 2 diabetes. (continued)

Provider Recommendations	Best Practices
<p>5. Treat youth with type 2 diabetes (continued)</p>	<ul style="list-style-type: none"> - Obtain laboratory work, including: <ul style="list-style-type: none"> • Fasting plasma glucose each visit. • A1c quarterly. • Proteinuria at diagnosis and annually. If protein is negative, obtain microalbuminuria. • Serum creatinine at diagnosis and as needed based on drug therapy. Conduct annually for patients with hypertension and negative microalbuminuria and for those taking ACE inhibitors. • Fasting lipid profile including total cholesterol, LDL, HDL, and triglycerides at diagnosis and annually with the goal to reduce LDL. • Before starting oral hypoglycemia agents, check liver function tests including aspartate transaminase (AST) and alanine transaminase (ALT). - Review the management plan to ensure a team-managed, comprehensive approach that includes: <ul style="list-style-type: none"> • Self-monitoring of blood sugar. • Medical nutrition therapy. • Diabetes education. • Physical activity education. • Preconception care. • Immunizations. • Dental examinations. • Behavioral and lifestyle modification through individualized therapy to achieve goals. Considerations should include the child’s age, other illnesses, lifestyle, self-management skills, level of motivation, and readiness to change. - Address cardiovascular risk factors, including: <ul style="list-style-type: none"> • Dyslipidemia. • Hypertension. • Physical inactivity. • Smoking and alcohol. • Microalbuminuria. <p>Refer to Gahagan and Silverstein, 2003, for further information on addressing cardiovascular risk factors.</p>

Best practices for health care organizations

A health care organization that wants to improve type 2 diabetes care and prevention for youth must be motivated and prepared for change throughout the entire organization. The organization’s leadership must identify care of youth at risk of developing type 2 diabetes and youth with type 2 diabetes as important. They must also develop clear improvement goals, policies, and effective improvement strategies. This will help encourage the entire organization to make changes that will help improve type 2 diabetes care and prevention efforts directed at youth.

Table 2 describes the best practices for health care organizations.

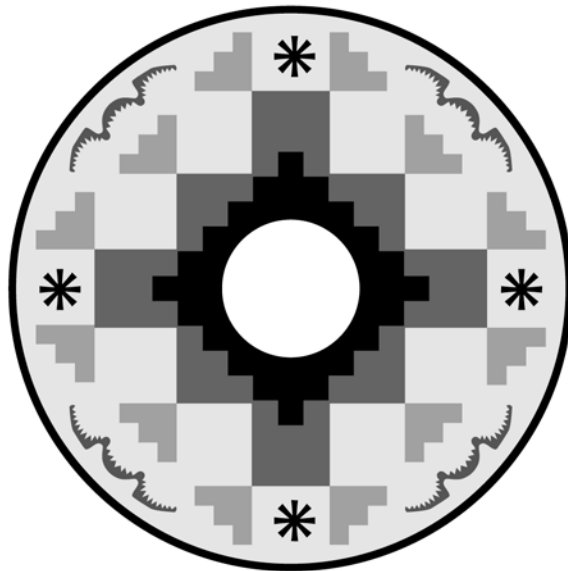
Table 2. Best practices for health care organizations.

Organization Recommendations	Best Practices
<p>System and programmatic changes</p>	<p><i>Why?</i></p> <p>Health care systems will need to adequately address the increasing prevalence and incidence of youth with type 2 diabetes and youth at risk of developing type 2 diabetes. To do so, health care systems must adapt their prevention and treatment practices and policies to include youth.</p> <p><i>How?</i></p> <p>The following activities may help improve type 2 diabetes prevention and care among youth:</p> <ul style="list-style-type: none"> – Expand Medicaid and State Children’s Health Insurance Program (SCHIP) eligibility periods for children with type 2 diabetes. Access to care is key. – Conduct a community needs assessment to determine what resources are available for youth. Please refer to the following website for information on how to conduct a community needs assessment: http://ctb.ku.edu/tools/EN/sub_section_main_1019.htm. – Develop partnerships between the health care system and community programs and organizations. – Conduct awareness campaigns and education programs to disseminate information about type 2 diabetes prevention in youth. – Provide training and continuing education to health care providers and field health personnel. – Increase efforts for early identification of youth at risk of developing type 2 diabetes. – Identify youth and prevention of type 2 diabetes as a key priority in the health care system’s annual goals. – Provide support (e.g., space, time, and money) for youth activities and interventions.

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Table 2. Best practices for health care organizations. (continued)

Organization Recommendations	Best Practices
<p>System and programmatic changes (continued)</p>	<ul style="list-style-type: none"> - Support policy and environmental changes in clinics, schools, teen centers, and tribal centers. For example, ban soda pop and unhealthy food items in these environments. - 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).



Essential elements of best practice programs for youth and type 2 diabetes

High quality type 2 diabetes care and prevention for youth involves implementing six essential elements* in your health care organization. These elements are:

- Community resources and policies.
- Health care organization leadership.
- Patient self-management support.
- Delivery system design: Services, programs, systems, and procedures.
- Decision support: Information and training for providers.
- Clinical information systems: Collecting and tracking information.

Table 3 summarizes how these elements apply to basic, intermediate, and comprehensive youth and type 2 diabetes programs.

* Adapted from the Chronic Care Model, which was developed by the MacColl Institute for Healthcare Innovation at the Group Health Cooperative. For more information on the Chronic Care Model, visit their website at www.improvingchroniccare.org.

Table 3. Essential elements of basic, intermediate, and comprehensive best practice programs for youth and type 2 diabetes.

Basic Youth and Type 2 Diabetes Programs	Intermediate Youth and Type 2 Diabetes Programs Basic program <i>plus</i> :	Comprehensive Youth and Type 2 Diabetes Programs Basic and intermediate programs <i>plus</i> :	Examples
Community resources and policies			
<ul style="list-style-type: none"> - Raise awareness in the community about the problem of type 2 diabetes in youth. - Conduct an inventory of community resources. - Assign designated staff to identify referral sources and work with community agencies to develop community programs and policies. - Train school personnel to serve youth with type 2 diabetes. - Collaborate with community programs and resources to increase public education to treat and prevent type 2 diabetes in youth. - Hold community prevention meetings. 	<ul style="list-style-type: none"> - Conduct awareness programs, such as health fairs, and disseminate information. - Train field health personnel in youth type 2 diabetes prevention and treatment. - Provide program continuity to ensure ongoing intervention with program participants. - Have a staff member trained in type 2 diabetes in the schools. - Provide programs that involve the family in type 2 diabetes prevention. 	<ul style="list-style-type: none"> - Develop and implement youth type 2 diabetes prevention and treatment community education programs. - Identify community role models. 	<ul style="list-style-type: none"> - Identify potential community partners, such as gyms, pools, and parks, to interest youth and offer programs tailored to youth. - Work with schools, school health advisory boards, the YMCA, and Boys and Girls Clubs. - Identify youth and type 2 diabetes specialists, groups like local American Diabetes Association chapters, diabetes camps, and soccer or sports camps.

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Table 3. Essential elements of basic, intermediate, and comprehensive best practice programs for youth and type 2 diabetes. (continued)

Basic Youth and Type 2 Diabetes Programs	Intermediate Youth and Type 2 Diabetes Programs Basic program <i>plus</i> :	Comprehensive Youth and Type 2 Diabetes Programs Basic and intermediate programs <i>plus</i> :	Examples
Organization leadership			
<ul style="list-style-type: none"> – Support quality improvement for type 2 diabetes treatment and prevention in youth. – Provide a strong and positive policy environment with visible leadership, integrated policies, and legislative frameworks. – Provide program support and resources (e.g., space, staff, equipment, and money). – Review program plans on a quarterly basis. – Develop strategies to sustain the program in future years. 	<ul style="list-style-type: none"> – Identify specific youth process measures in the clinic’s annual goals. – Assess resources and needs, and address barriers to ensure that the organization can reach its goals. 	<ul style="list-style-type: none"> – Include specific youth outcome measures in annual performance-based objectives. – Commit stable funds for permanent staff positions. – Support and implement policy and environmental changes (e.g., soda banned from schools, physical activity in schools, and walking school buses). 	<ul style="list-style-type: none"> – Ensure support from tribal council or the tribal or urban health board. – Dedicate resources from the health care facility and community health programs. – Obtain school board support and dedicated resources (e.g., equipment, space). – Assign a staff person to type 2 diabetes prevention in youth. – Conduct a formal or informal community assessment (e.g., School Health Index). – Establish process measurements (e.g., dates and numbers of classes, activities, type held, number of participants, number completing most or all of the program, and materials distributed). – Establish outcome measurements (e.g., pre-post questionnaires and surveys to identify changes in knowledge, attitudes, behavior, participant satisfaction with program, and effectiveness of program). – Find other resources through grant writing and forming partnerships for sustainability.

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Table 3. Essential elements of basic, intermediate, and comprehensive best practice programs for youth and type 2 diabetes. (continued)

Basic Youth and Type 2 Diabetes Programs	Intermediate Youth and Type 2 Diabetes Programs Basic program <i>plus</i> :	Comprehensive Youth and Type 2 Diabetes Programs Basic and intermediate programs <i>plus</i> :	Examples
Patient self-management support			
<ul style="list-style-type: none"> - Offer multi-disciplinary patient education. - Develop age-relevant and culturally appropriate education materials and methods in various formats suitable for youth (e.g., websites, e-mail listservs, and videos). - Address mental health issues, including self-esteem, depression, and emotions that may accompany a diabetes diagnosis. - Offer patient education that involves the family unit. 	<ul style="list-style-type: none"> - Provide education within the framework of an IHS-certified (or equivalent) curriculum. - Develop innovative methods to communicate type 2 diabetes guidelines to youth. 	<ul style="list-style-type: none"> - Develop a comprehensive education program with modules specifically for youth that provide education and entertainment that is culturally sensitive. - Designate a staff member to work and communicate with youth and their families. 	<ul style="list-style-type: none"> - Conduct periodic testing of youth knowledge about type 2 diabetes. - Demonstrate blood testing. - Use flowsheets for nutrition, physical activity, and type 2 diabetes education. - Use exercise prescriptions, support groups, fitness coaches, and diaries. - Establish youth-directed goals. - Seek input from youth for the best way to conduct follow-up. - Designate and train a person to work with youth and families. - Make education programs entertaining and meaningful to hold youth's attention. - Provide support and advocate for type 2 diabetes management activities in the classroom (e.g., medication, self-monitoring of blood sugar, snacks, etc.).

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Table 3. Essential elements of basic, intermediate, and comprehensive best practice programs for youth and type 2 diabetes. (continued)

Basic Youth and Type 2 Diabetes Programs	Intermediate Youth and Type 2 Diabetes Programs Basic program <i>plus</i> :	Comprehensive Youth and Type 2 Diabetes Programs Basic and intermediate programs <i>plus</i> :	Examples
Patient self-management support (continued)			
			<ul style="list-style-type: none"> – Provide information through kiosks, e-mail, websites, CD-ROM self-learning products, movies, and videos. – Use creative ideas to help youth learn about type 2 diabetes prevention and treatment (e.g., encouraging youth to bring friends to type 2 diabetes education activities, creative type 2 diabetes camp ideas, and providing youth with cameras to interview each other about type 2 diabetes and share success stories).

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Table 3. Essential elements of basic, intermediate, and comprehensive best practice programs for youth and type 2 diabetes. (continued)

Basic Youth and Type 2 Diabetes Programs	Intermediate Youth and Type 2 Diabetes Programs Basic program <i>plus</i> :	Comprehensive Youth and Type 2 Diabetes Programs Basic and intermediate programs <i>plus</i> :	Examples
Delivery system design: Services, programs, systems, and procedures			
<ul style="list-style-type: none"> – Establish a diabetes team that meets on a regular basis; includes lifestyle coaches, recreational staff, and nutrition counselors; and commits to improving the health of youth. – Ensure youth have access to appropriate providers, specialists, and specialty clinics. – Develop a case finding mechanism. – Establish methods for youth and family involvement in designing, developing, implementing, and evaluating youth type 2 diabetes programs. – Develop an appropriate evaluation plan, including feedback from program participants. – Develop an appointment system. 	<ul style="list-style-type: none"> – Integrate the system of health care from the clinical system to the schools, community, and family programs (e.g., develop referral systems to programs for physical activity, weight management, and exercise prescription at all levels of the integrated system of health care). – Designate a case manager for youth. 	<ul style="list-style-type: none"> – Develop youth outreach programs. – Establish teen clinics. – Provide ongoing and interesting educational programs (e.g., day or overnight type 2 diabetes camps and different media). – Develop recruitment and retention plans for the youth programs. 	<ul style="list-style-type: none"> – Establish a diabetes team with a nurse practitioner, physician, dentist, registered dietitian, exercise physiologist, clinical psychologist, and pharmacist. – Where possible, explore or set up teen clinics. – Train diabetes providers to work with youth.

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Table 3. Essential elements of basic, intermediate, and comprehensive best practice programs for youth and type 2 diabetes. (continued)

Basic Youth and Type 2 Diabetes Programs	Intermediate Youth and Type 2 Diabetes Programs Basic program <i>plus</i> :	Comprehensive Youth and Type 2 Diabetes Programs Basic and intermediate programs <i>plus</i> :	Examples
Decision support: Information and training for providers			
<ul style="list-style-type: none"> – Train providers in communicating with and being sensitive to the needs of youth. – Train providers on the risk factors for type 2 diabetes, appropriate diagnostic testing, patient referrals, and guidelines for type 2 diabetes. – Train clinic triage support staff in appropriate techniques for measuring, recording, and calculating BMI. – Implement provider training for childhood overweight management. Use all available tools and provide ongoing online support. 	<ul style="list-style-type: none"> – Develop or adopt detailed guidelines on childhood overweight management. – Train all staff on the importance of screening children and youth for overweight, and how to record this information in the medical record. 	<ul style="list-style-type: none"> – Train local providers in the comprehensive care of childhood and adolescent type 2 diabetes and overweight. – Train all staff on motivational interviewing resources available in the community for overweight youth, sensitivity in working with overweight youth, and simple public health messages to deliver to all children and youth on reducing their risk for overweight and type 2 diabetes. 	<ul style="list-style-type: none"> – Use evidenced-based guidelines and best practices.
Clinical information systems: Collecting and tracking information			
<ul style="list-style-type: none"> – Conduct annual diabetes audits. 	<ul style="list-style-type: none"> – Tracking health measures (e.g., risk assessments, education, and referrals), and listing them on the Health Summary. 	<ul style="list-style-type: none"> – Use audit information to track care. 	<ul style="list-style-type: none"> – Track individuals and populations. – Use the IHS Diabetes Care and Outcomes Audit. – Conduct patient satisfaction surveys. – Develop youth checklists created by the health care team with input from youth.

Evaluating your youth and type 2 diabetes program

Evaluation is important because it helps you see what is working and what is not working in your youth and type 2 diabetes program. It will show you if adjustments or changes need to be made in order to improve your youth and type 2 diabetes program. Evaluation also provides you with information that you can use to share your successes with patients, providers, tribal leaders, administrators, the community, funders, and other stakeholders.

Consider the following in your evaluation plan:

- What are the goals and the objectives of the program? (Use SMART objectives = **S**pecific, **M**easurable, **A**ttainable, **R**ealistic, and **T**ime-bound objectives)?
- Is the program following the “gold standard” for prevention and treatment? (See the American Academy of Pediatrics prevention and treatment recommendations for youth with type 2 diabetes (Gahagan *et al.*, 2003). Available online at: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;112/4/e328>.)
- Does the program have a data collection plan including a plan to capture baseline information?
- Does the program have a focused evaluation, and can it describe the purpose of the evaluation?
- What are the data resources available (e.g., health clinic, school, county, Behavioral Risk Factor Surveillance System (BRFSS) data)? If data are not readily available, is there a plan in place to collect, enter, analyze, and interpret data?
- What are the measures of success? For example:
 - Do you have less staff turnover?
 - Do you have more paid staff?
 - Are you working with community groups?
 - Do you have the capability to track the program’s activities?
 - Is your program able to conduct interviews with parents to determine what behaviors the child and family have changed?
 - Do your participants feel better about themselves as a result of the program?
 - What are the markers that will be used to measure success (e.g., A1c and weight)?
 - Are youth involved in the physical activity program?
 - Are youth improving their food choices?
 - Are youth with type 2 diabetes taking their medications as prescribed and keeping appointments?
 - What is the child’s attitude toward having type 2 diabetes?
 - Are trained personnel available to take and analyze measurements?
 - Does your program use teen letters, e-mails, newsletters, radio, and other media sources?

Sustaining your youth and type 2 diabetes program

Often, for diabetes goals to be reached, programs must be in place for more than a few years. Here are some helpful tips for sustaining the program:

- Resources: Provide funding to continue diabetes prevention and treatment youth programs.
- Environmental and policy factors: These may include creating safe walking trails; health breaks during school; banning soda pop from schools; making walking a community norm for families; creating indoor and outdoor recreation areas; working with schools, tribes, and clinics to make policy changes; establishing time for providers to do case-management and other youth type 2 diabetes activities.
- Social and cultural factors: These may include buying bottled water or sugar-free soda pop, 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.
- Capacity building: Train school staff to continue program efforts. For example, in the first year, your program implements activities. In the second year, the program implements activities with school teachers. In the third year, the teacher runs the program.

Contacting others for help

Contacting other people involved in youth and type 2 diabetes 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. Here are some tips on how to connect with others:

- Ask your Area Diabetes Consultant for the names of people who may be able to help you.
- Contact the IHS Division of Diabetes Treatment and Prevention for ideas. They may be able to point you in the right direction.
- Ask the IHS Integrated Diabetes Education Recognition Program for suggested contacts. They have names and contact information for people who work with IHS-accredited diabetes education programs.
- Review resources from the National Diabetes Education Program (NDEP). NDEP offers materials that will help your program get started, including information specifically for American Indians and Alaska Natives. You can access these resources at the website: www.ndep.nih.gov

Real-world best practice programs

Absentee Shawnee Diabetes Program

Leslie Harris

☎ (405) 275-4030, extension 213

This program has developed several type 2 diabetes programs for youth, including “Native Youth Preventing Diabetes (NYPD)” and “Two Stars”.

CAMP Department (Nome, Alaska)

Kelly Keyes, CAMP Diabetes Nutritionist

☎ (907) 443-4583

✉ kkeyes@nshcorp.org

CAMP works in collaboration with the Nome Recreation Center, which provides most of the facilities and equipment for classes. The program rents the Nome Swimming Pool to conduct swimming classes. The eight-week program offers various types of activities related to physical activity and nutrition. CAMP incorporates community teen leaders, community volunteers, and nutrition interns to help run the program.

Cherokee Nation Diabetes Program

Lisa Perkins

☎ (918) 456-0671

This program has developed several youth type 2 diabetes programs, including summer youth fitness camps (both residential and day camps), an incentive-based fitness and awareness program called “Wings”, and technical assistance programs that help schools use the School Health Index to implement and sustain health promotion activities, lifestyles, and environments in schools.

Choctaw Nation Diabetes Program

Annette Choate

☎ (918) 465-8031

This program has developed a type 2 diabetes awareness school program that uses a video and live skit called “The Salad Sisters”.

Eastern Band of Cherokee Indians “Cherokee Choices/REACH 2010 Program”

Jeff Bachar, Program Director

☎ (828) 497-1970

✉ jbachar@nc-chokeee.com

This CDC-funded program has developed a mentoring component for elementary school students as part of a larger community-based health promotion intervention that includes worksite wellness, social marketing, and faith-based programs. In the mentoring component, paid adult mentors spend time with children in class, at lunch and recess, and after school. Lesson plans have been developed that correspond to North Carolina curriculum objectives and focus on stress management, understanding emotions, conflict resolution, self-efficacy, and diabetes-related knowledge building. The after-school program encourages cultural pride, physical activity, and team building. Cherokee Choices/REACH 2010 also supports changes to the school environment that encourage staff to engage in healthy activities, persuade parents to provide healthy snacks, and reduce saturated fat in school menus.

Haskell Diabetes Program

Paula Foster

☎ (785) 832-4813

This program has developed a family-based program to reach young women.

Muscogee (Creek) Nation Health System Diabetes Program

Scott Robison

☎ (918) 695-1325

✉ scott.robison@mail.ihs.gov

This program has developed and uses several programs for youth, including “Move It and Prevent Diabetes: Elementary School-Based Program”, “Hop to Stop Diabetes: Jump Rope Program”, type 2 diabetes prevention youth day camps, and family prevention overnight camps.

Navajo Coordinated School Health Program (IHS – Shiprock, New Mexico)

Shaundale Gamboa

☎ (505) 368-6321

They have developed a school-based health promotion program that addresses emotional and mental wellness, employee wellness, safe and healthy environments, health services, families, school and community partnerships, nutrition, comprehensive health education, and physical activity.

Oklahoma Native EXPORT Center

University of Oklahoma Health Sciences Center

☎ (888) 231-4671

✉ export@ouhsc.edu

This National Institutes of Health (NIH)-funded research and training program addresses diabetes and obesity among American Indians in several Oklahoma Tribes. The primary focus of the program is on research for the prevention of diabetes. However, the program has implemented creative interventions on physical activity among youth, increasing breastfeeding practices, and community education.

Spokane Tribe of Indians

Roger Garza

☎ (509) 258-7502, extension 35

✉ PO Box 540
Wellpinit, Washington 99040

The Spokane Tribe of Indians diabetes program provides opportunities for children to participate in diabetes and obesity prevention activities. This program also provides training to food preparers on the *Kitchen Creations* menu and curriculum from New Mexico State University.

Teen Life Center, IHS Shiprock (New Mexico)

Susie John

☎ (505) 368-7450

The Teen Life Center provides counseling and referral, outpatient substance abuse counseling, aftercare, substance abuse evaluations and referrals, ropes courses, river rafting, annual physical exams, minor health care, nutrition counseling, immunizations, and family planning.

Taos Pueblo Diabetes Program

Ezra Bayles

☎ (505) 758-7824

The Taos Pueblo Diabetes Program offers a variety of wellness activities specifically for youth including:

- Competitive sports team activities (e.g., soccer and basketball).
- Individual activities (e.g., rock climbing, golf, and ice-skating).
- School-based, non-competitive physical education classes.
- Supervised wellness activities during an after school program at the Taos Pueblo Day School.
- Cooking classes.
- Nutrition education classes.
- “Healthy choices”-based curriculum for students in grades K–8.
- Addressing food and nutrition policies at Head Start, the senior center, and Taos Pueblo Day School.

Tulsa Urban Health Center

Nancy O’Banion

☎ (918) 382-1220

This program has developed youth type 2 diabetes prevention camps that provide experiential learning activities and ropes courses.

Helpful websites

5 A Day

The goal of this program is to educate adults and youth about creative ways to increase consumption of fruits and vegetables.

☎ www.5aday.org

ABCs of Teaching Nutrition to Your Kids

☎ www.askdrsears.com/html/4/T040200.asp

American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD)

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.

🔗 www.aahperd.org

American Diabetes Association

Offers information on diabetes for educators and lay people.

🔗 www.diabetes.org

American Diabetes Association Virtual Grocery Store

🔗 http://vgs.diabetes.org/homepage.jsp?WTLPromo=NUTRTION_vgs&vms=196528892522

California Department of Education

The California Department of Education discovered that there is a positive relationship between academic achievement and the physical fitness of California's public school students. This website provides more information.

🔗 www.cde.ca.gov/nr/ne/yr02/yr02rel37.asp

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

🔗 www.consumersunion.org/other/captivekids/index.htm

Centers for Disease Control and Prevention: VERB Campaign

The VERB Campaign is designed to encourage physical activity for American Indians and Alaska Natives.

🔗 www.cdc.gov/youthcampaign

Google

Type in the words for which you want to learn something (e.g., "ways to increase physical activity in youth").

🔗 www.google.com

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.

🔗 www.ihs.gov/medicalprograms/diabetes/index.asp

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.

🔗 www.ihs.gov/medicalprograms/nutrition

National Diabetes Education Program

The National Diabetes Education Program is a federally funded program sponsored by the U.S. Department of Health and Human Services, NIH, and CDC. It includes over 200 partners at the federal, state, and local levels, working together to reduce the morbidity and mortality associated with diabetes.

🔗 www.ndep.nih.gov

New Food Guide Pyramid

The food guide pyramid has been rebuilt. The biggest change is that the food groups are no longer horizontal blocks of the pyramid. Now, a rainbow of colored, vertical stripes represent the five food groups, as well as fats and oils.

🔗 http://kidshealth.org/kid/stay_healthy/food/pyramid.html

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>

PE4Life

PE4life inspires active, healthy living by advancing the development of quality, daily physical education programs for all children.

🔗 <http://pe4life.com>

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.

🔗 www.pecentral.org

Public Broadcasting System Food Smart

🔗 <http://pbskids.org/itsmylife/body/foodsmarts/article4.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.

🔗 www.smart-mouth.org

U.S. Department of Agriculture: MyPyramid Plan

The MyPyramid Plan can help adults and youth choose the foods and amounts that are right for them.

🔗 www.mypyramid.gov

World Health Organization: BMI Charts

This website provides BMI charts for children from birth to 5 years. (See the Appendix at the end of this best practice for copies of the BMI charts.)

🔗 www.who.int/childgrowth/standards/bmi_for_age/en/index.html

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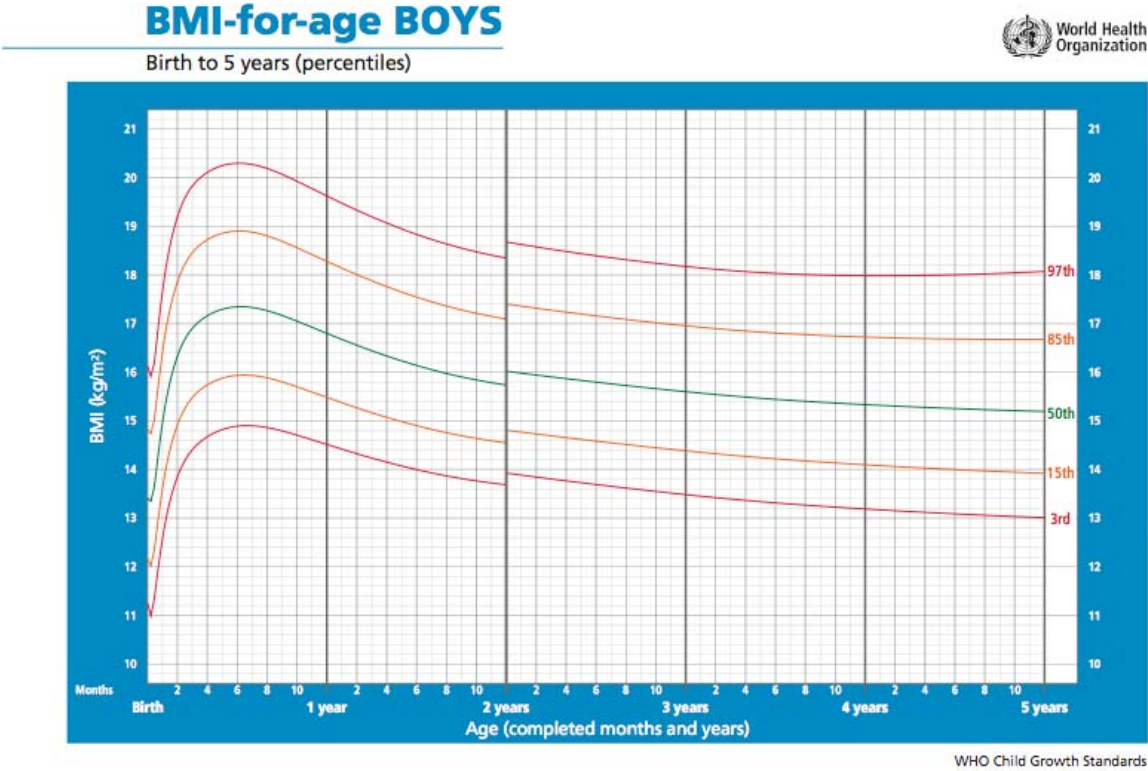
Tuomilehto J, Lindstrom J, Eriksson JG, Valle TT, Ilanne-Parikka P, Keinänen-Kiukaanniemi S, Laakso M, Louheranta A, Rastas M, Salminen V, and Uusitupa M; Finnish Diabetes Prevention Study Group. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *New England Journal of Medicine*. 2001;344(18):1343–50.

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Appendix: World Health Organization BMI Charts

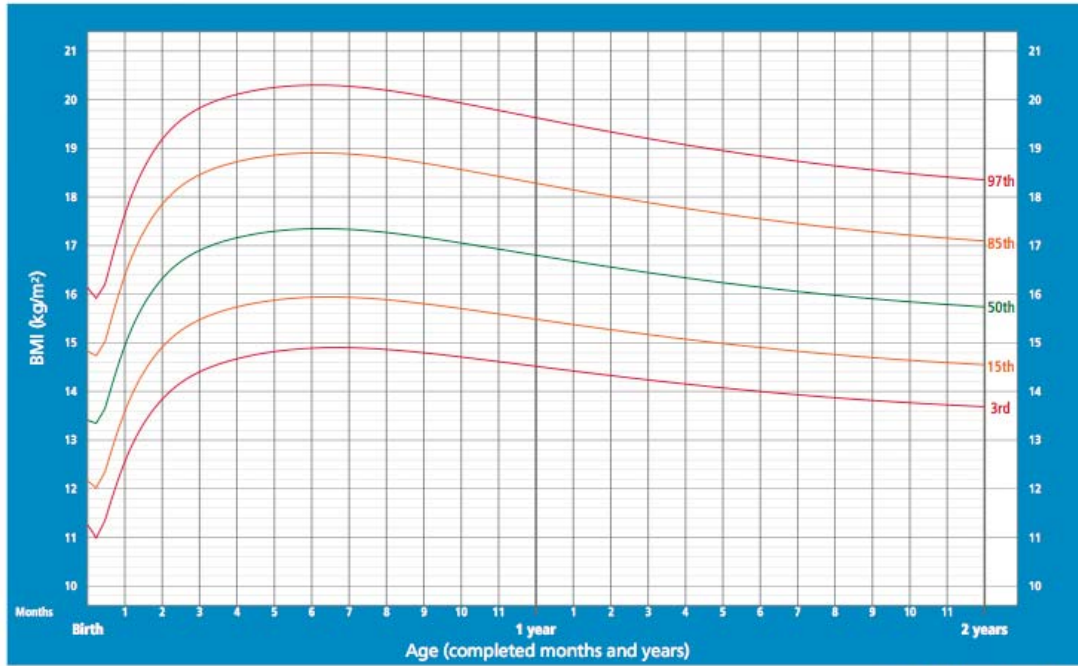
BMI Charts for Boys: Birth to 5 Years



BMI Charts for Boys: Birth–2 Years

BMI-for-age BOYS

Birth to 2 years (percentiles)

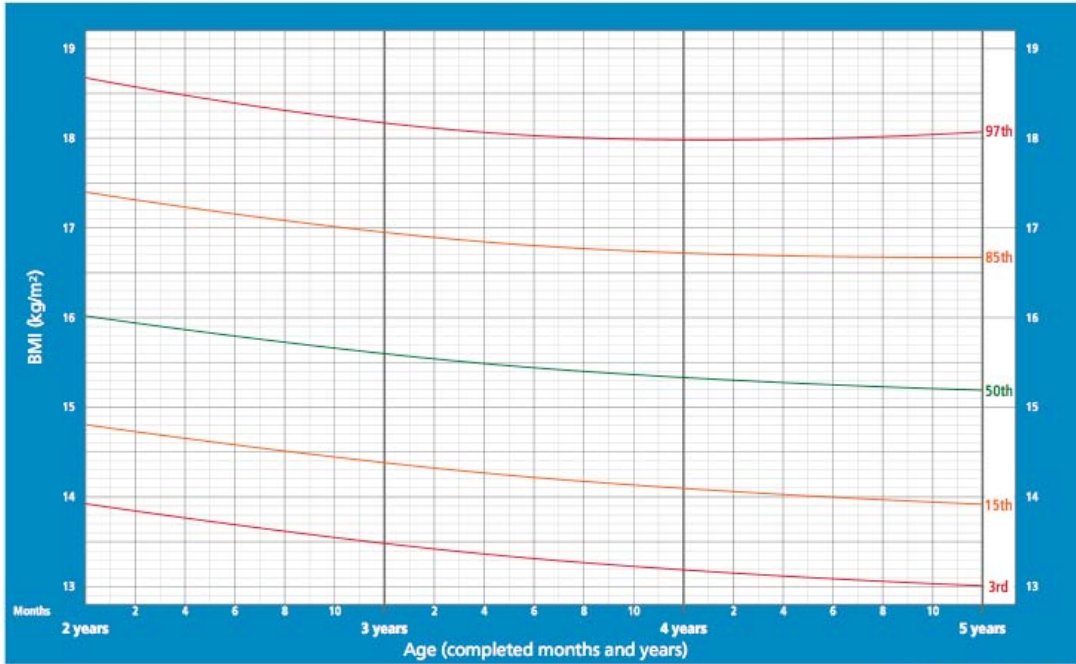


WHO Child Growth Standards

BMI Charts for Boys: 2-5 Years

BMI-for-age BOYS

2 to 5 years (percentiles)

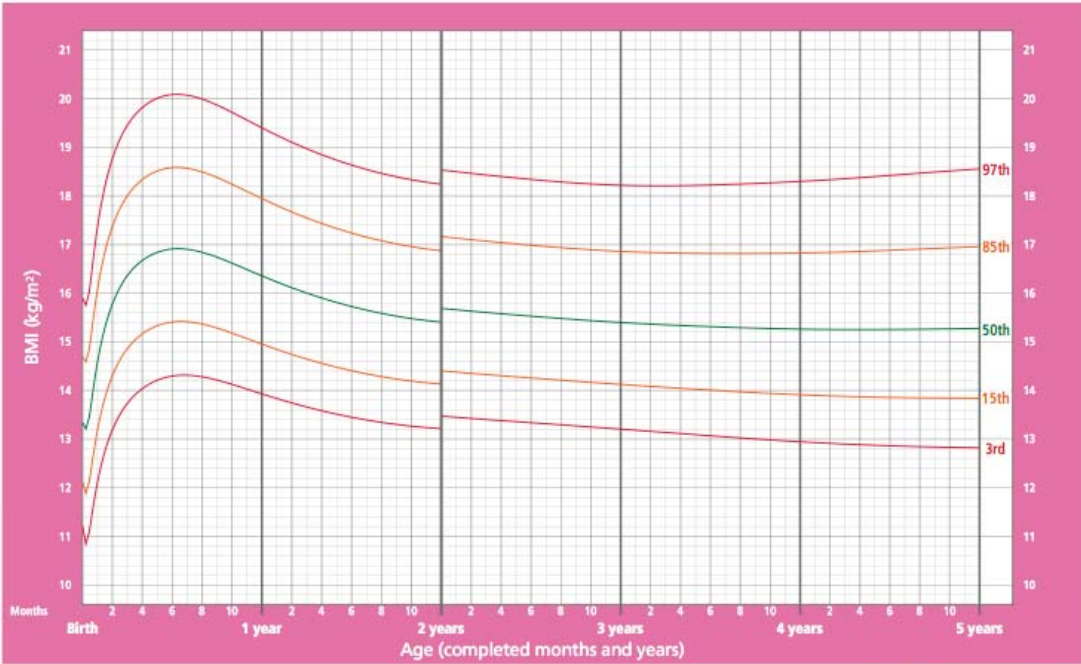


WHO Child Growth Standards

BMI Charts for Girls: Birth–5 Years

BMI-for-age GIRLS

Birth to 5 years (percentiles)

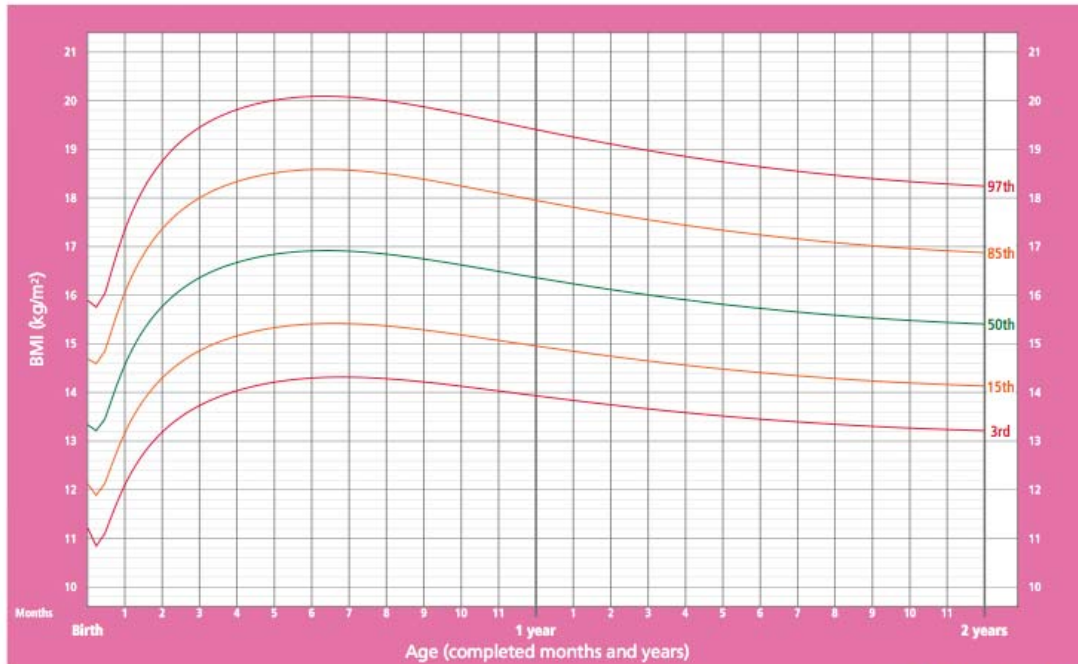


WHO Child Growth Standards

BMI Charts for Girls: Birth–2 Years

BMI-for-age GIRLS

Birth to 2 years (percentiles)

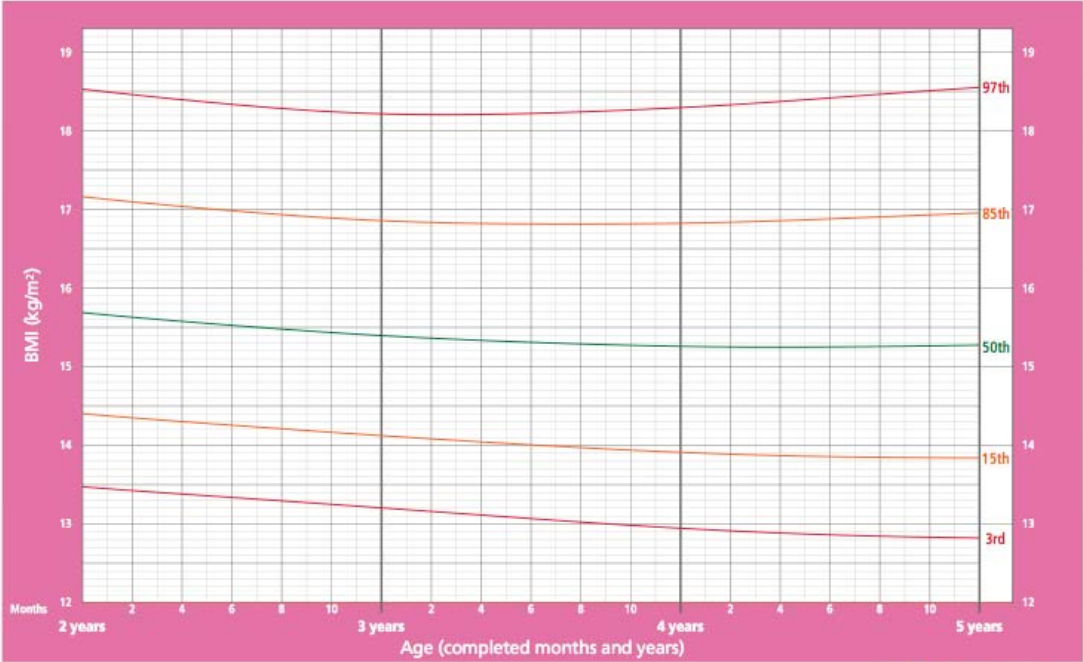


WHO Child Growth Standards

BMI Charts for Girls: 2–5 Years

BMI-for-age GIRLS

2 to 5 years (percentiles)



WHO Child Growth Standards