

Diabetes Mellitus, Type 2

Type 2 diabetes mellitus is a chronic disease in which the body becomes resistant to the effects of the hormone insulin. This results in higher than normal levels of blood sugar (glucose). Once rare in children, type 2 diabetes has become relatively common in obese children and teens. Any type of diabetes can cause serious complications. However, with good medical care and education, your child with diabetes can lead a healthy, active life.

What is type 2 diabetes mellitus?

Children with type 2 diabetes become resistant to the effects of insulin (the insulin isn't working as well as it should), which the body needs to use glucose (blood sugar) for energy. This leads to abnormally high glucose levels in the blood. Unlike children with type 1 diabetes, many with type 2 will not need insulin to control their blood sugar.

Type 2 diabetes is a serious medical problem that requires close attention to your child's medications, diet, and activity. Living with diabetes is difficult for children, especially during the teen years. However, learning to control diabetes allows your child to live a relatively normal life. Type 2 diabetes mellitus was formerly called "non-insulin-dependent" or "adult-onset" diabetes.

What does it look like?

Type 2 diabetes usually develops in obese children, most commonly during the teen years.

- Your child may have no symptoms of diabetes. Type 2 diabetes may be detected initially because of elevated blood sugar levels on a routine laboratory test.
- Your child may have symptoms, such as tiredness or rapid weight gain.
- You may notice dark areas along skin creases, especially the armpits and neck (called acanthosis nigricans).
- Other symptoms are more common in children with type 1 diabetes (in which the body cannot make enough insulin) but may also occur in type 2 diabetes:
 - Frequent thirst—drinking a lot of water.
 - Frequent urination—sometimes bedwetting.
 - Frequent infections—girls may have yeast infections of the vagina.
- ! **Hypoglycemia** is a complication of treatment with insulin or with medications used to treat type 2 diabetes, occurring when the blood sugar level drops too low. It is very important to identify hypoglycemia. Symptoms include:

- Shakiness.
- Sweating.
- Behavior changes, such as drowsiness.
- In more severe cases, confusion, coma, and seizures may occur.
- ! **Ketoacidosis.** This condition occurs much less commonly with type 2 diabetes than with type 1. If insulin levels become very low and blood glucose levels very high, your child may develop a condition called *diabetic ketoacidosis*. The inability to use glucose leads to production of acids in the body. Symptoms of diabetic ketoacidosis include:
 - Abdominal pain.
 - Nausea and vomiting.
 - Weakness or dizziness.
 - Confusion.

As ketoacidosis becomes worse, your child becomes more dehydrated. He or she may pass out and have trouble breathing. *This is an emergency!*

What causes type 2 diabetes?

Type 2 diabetes occurs when the muscles and other body tissues become resistant to the effects of insulin. The level of glucose in the blood becomes abnormally high. Eventually, the body has problems making its own insulin.

What puts your child at risk of type 2 diabetes?

- Obesity and lack of exercise are the main risk factors for type 2 diabetes. Habits that increase your child's risk of obesity—such as eating too much, eating the wrong kinds of foods, and not getting enough exercise—also increase the risk of type 2 diabetes.
- Certain racial/ethnic groups seem to be at higher risk for type 2 diabetes, including African Americans, Mexican Americans, and Native Americans.
- If you or others in your family have had type 2 diabetes, your child may be at higher risk.

Can type 2 diabetes be prevented?

In many cases, yes. Nearly all children with type 2 diabetes are obese and get little exercise. If your child is obese or overweight, a weight-loss program, including diet changes and exercise, will reduce his or her chances of developing diabetes.

What are the possible complications of type 2 diabetes?

Type 2 diabetes can cause many different types of complications. Learning to manage your child's blood glucose levels can reduce the long-term risk of these complications:

- Damage to the retina of the eye.
- Damage to the kidneys.
- Increased risk of diseases involving the blood vessels, including heart disease and stroke.

! ● *Hypoglycemia* and *ketoacidosis*, described under “What does it look like.”

How is type 2 diabetes treated?

- *Weight control, diet, and exercise* are essential first steps in the treatment of type 2 diabetes. Losing weight and increasing physical activity can greatly reduce the impact of the disease. We may recommend visits with a dietician, diabetes educator, or other professional to help your child (and family) learn healthier diet and exercise habits. We may also recommend a visit to an endocrinologist (an expert in treating hormone-related diseases) including diabetes.

- *Medications.* A number of different oral medications can help to reduce your child's blood glucose level. Some children with type 2 diabetes require insulin injections (shots), temporarily or permanently. The type, dose, and timing of medications, including insulin shots, depend on your child's blood glucose levels.

- *Blood glucose monitoring.* You or your child will be taught to measure his or her blood glucose level several times a day. Recording the results will help to make sure that your child's diabetes is under the best possible control. Modern test devices have made blood glucose monitoring easier than ever.

- *Education.* You and your child will receive training on how to use insulin if needed, how to monitor blood glucose levels, how to recognize danger signs of low or high glucose levels, and how to prepare appropriate meals for a person with diabetes.

! *Treatment of diabetic emergencies.* Learning how to recognize and treat hypoglycemia and ketoacidosis is an essential part of your child's diabetes care:

- *Hypoglycemia* occurs when blood sugar levels drop too low:
 - If symptoms are mild, the first step is to check your child's blood sugar level. If symptoms are more severe (for example, if your child is becoming drowsy), start treatment immediately and check blood sugar levels later.

- Give your child something sweet, for example, juice or candy.

- Give your child a shot of glucagon. You will be supplied with and taught how to use this emergency medication. It is used when the blood sugar level needs to be raised immediately.

- *Ketoacidosis* occurs when your child's blood sugar level is high, meaning not enough insulin is present and so *acids* are produced. Ketoacidosis occurs very frequently in type 2 diabetes.

- Call your endocrinologist or call our office. Seek medical help immediately.

- Give insulin as instructed by the doctor.

- Give as much fluid as possible to manage dehydration.

It can be very difficult to remember all of the information you need to manage your child's diabetes, especially at first! With time, however, you and your child can learn what you need to know to keep diabetes under control. This allows your child to live as normal a life as possible, while reducing the risk of serious complications.

Psychological issues. Having a child diagnosed with type 2 diabetes is a traumatic event for your family. Parents may feel anxious and guilty. Your diabetic child may feel rebellious, especially during the teenage years. Counseling may help your family to deal with difficult feelings and family conflicts.

! When should I call your office?

Call your endocrinologist, or call our office, if any of the following occurs:

- Your child develops any of the symptoms of diabetes mellitus (fatigue, frequent thirst or hunger, excessive urination).

- You and your child are having difficulty performing diabetes self-management or keeping blood glucose levels under control.

- Your child has frequent episodes of hypoglycemia or develops moderate/severe hypoglycemia (confusion, weakness, sweating, paleness, unconsciousness, or seizures). *This is an emergency!*

- Your child develops symptoms of ketoacidosis (abdominal pain, nausea and vomiting, weakness or dizziness, and confusion). *This is an emergency!*

Where can I get more information?

- American Diabetes Association: www.diabetes.org or 1-800-DIABETES (1-800-342-2383).

- National Diabetes Information Clearinghouse: www.diabetes.niddk.nih.gov or 1-800-860-8747.

