

How Is Diabetes Treated in Children?

Is your child packing on the pounds?

Becoming a couch potato?

Then he or she may be at risk for getting type 2 diabetes.

Type 2 diabetes once occurred mainly in adults who are overweight and over 40, according to the National Institute of Diabetes and Digestive and Kidney Diseases. Today, it is increasingly diagnosed in youths age 10 to 19.

Why is this happening?

Because just like adults, kids are heavier now. An estimated 1 in 6 children and teens is obese, according to the Centers for Disease Control and Prevention.

Along with a family history of diabetes, being overweight and inactive are the main risk factors for type 2 diabetes, says Ilan Irony, M.D., an endocrinologist at the Food and Drug Administration (FDA).

The two main types of diabetes—type 1 and type 2—are treatable, says Irony. “In addition to changes in diet and a healthier lifestyle, treatments can help control blood sugar and prevent or delay long-term complications of diabetes.”

FDA-approved treatments for both type 1 and type 2 diabetes are all about keeping the blood sugar (glucose) levels in a normal range.

But there is no one treatment that works for everybody, says Irony. And treatments may need to be changed if side effects of a particular medication are not tolerated. Also, additional



A teenager tests his blood sugar with a glucose meter. Keeping blood sugar close to the normal range can help prevent the complications of diabetes.

medications may need to be added as diabetes gets worse over time.

Type 2 Diabetes

Type 2 diabetes is most often diagnosed in children starting at age 12 or 13, says Irony. “In children, the disease tends to get worse in puberty when the body produces hormones that make insulin less effective,” he says. Insulin is the hormone that controls blood sugar levels.

“The first line of treatment is a healthy diet and other lifestyle changes,” says Irony. “If a child is overweight or obese, losing weight and increasing physical activity can help lower blood sugar.”

Ask the pediatrician if your child is a healthy weight or needs to lose weight. And children and adolescents should do at least one hour of physical activity each day, according to the federal government’s 2008 Physical Activity Guidelines for Americans.

Type 2 diabetes may be controlled with diet and exercise for a while—sometimes years—says Irony. “But the disease is progressive and medication will be needed later in the majority of patients.”

FDA has approved one glucose-lowering medication—metformin—in pill and liquid form for children. Metformin, used daily, increases the body’s sensitivity to its own insulin

What Is Diabetes?

Diabetes occurs because of defects in the body's ability to produce or use insulin—a hormone needed to convert food into energy. Insulin is made in the pancreas and is released into the blood to control glucose (sugar) levels and the amount of glucose transported into cells as an energy source. If the pancreas doesn't make

enough insulin, or if the cells do not respond appropriately to insulin, glucose can't get into the cells and instead stays in the blood and is passed in the urine. The blood sugar level then gets too high.

High blood sugar can, over time, lead to devastating health problems, including

- heart attack
- stroke
- kidney disease
- nerve damage
- loss of toes or feet
- digestive problems
- blindness
- gum problems and loss of teeth

so it becomes more active and pushes glucose into the cells. The most common side effects of metformin—upset stomach, nausea and diarrhea—generally go away within a few weeks.

In rare cases, metformin can cause a serious and sometimes fatal side effect called lactic acidosis—a buildup of lactic acid in the blood. This rare condition has occurred mostly in people whose kidneys were not working normally.

FDA has recently approved a number of different drugs for diabetes in adults that are currently being studied for use in children, Irony says.

Injectable insulins—which move glucose from the blood to the body's cells—are approved for children with diabetes. If the drug metformin alone doesn't bring the blood sugar down to normal, insulin can be injected and help achieve better control.

Type 1 Diabetes

Type 1 diabetes accounts for almost all diabetes in children younger than 10, and it is also on the rise in U.S. children and adolescents. Formerly called juvenile diabetes, type 1 occurs when the body's immune system destroys the insulin-making cells in the pancreas. Researchers are still investigating the causes of diabetes.

For children with type 1 diabetes, multiple injections of insulin are needed every day to keep the blood sugar in check.

"Treatment is individualized to the child and the spikes of high or low blood sugar need to be minimized," says Irony. It's a balancing act to lower the blood sugar but not get it too low, which could make the child feel shaky or pass out, he adds.

Diabetes Devices

Children with type 1 or type 2 diabetes, like adults, must test their blood sugar multiple times a day. FDA regulates medical devices, including portable meters and monitors, used to check blood sugar levels. The agency also regulates devices such as syringes, pens, and pumps used to inject insulin.

Syringes and pens are used manually to inject insulin. Pumps are computerized devices programmed to deliver a continuous flow of insulin, even while you sleep. FDA has approved more than 55 different insulin pumps. A pump system generally consists of

- a pumping mechanism that holds batteries and a cartridge filled with insulin. The pump, which is similar in size to a pager, is worn outside the body on a belt or in a pocket.

- a tube (catheter) that carries insulin from the pump to another tube (cannula) implanted just under the skin, typically in the belly or back.

Pump technology continues to evolve, says Alan Stevens, a mechanical engineer and FDA's infusion pump team leader. A newer type is the "patch" pump, he says, in which the tubing is contained within a pump directly attached to the body with adhesive. A small, hand-held computer similar to a PDA, which directs the pump, can be carried in a purse or pocket.

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