

# Recognizing Diabetes in Children

## What Does It Look Like?

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*Both type 1 diabetes and type 2 diabetes are on the rise in children. School nurses should be familiar with these conditions and have an understanding of who is more likely to be affected, what the presenting symptoms are, and how to support the student, family, and school personnel when a diagnosis is made. This article serves as a reference for school nurses and highlights key resources freely available for their use.*

**Keywords:** diabetes; diagnosis; school nurses

School nurses have likely heard parents say, “After my child was diagnosed with diabetes, a lot of things started to make sense. The symptoms were there; we just didn’t realize it.” Diabetes can be difficult to spot, even for the people who spend the most time with a child. While school nurses are not expected to screen and diagnose children with diabetes, all school nurses should be familiar with the prevalence, risk factors, symptoms, and diagnostic tests for diabetes. This article will serve as a reference for school nurses and provide them with resources to support youth, their families, and school personnel when a diagnosis is made.

### How Common Is Diabetes?

Just as it is in adults, diabetes is on the rise in children. Sadly, one in three children born in the year 2000 may go on to develop diabetes in their lifetime (Narayan, Boyle, Thompson, Sorensen, & Williamson, 2003). Most of those cases will be type 2 diabetes, which is linked to obesity; however, type 1 diabetes is also increasing for unknown reasons. Data from the SEARCH for Diabetes in Youth Study, which is funded by the National Institutes of Health and the Centers for Disease Control and Prevention, revealed that from 2001 to 2009, the proportion of youth ages 19 and younger with type 1 diabetes increased by 21%, and the proportion of youth ages 10 through 19 with type 2 increased by 30.5% (Dabelea, Mayer-Davis, et al., 2014).

During 2008-2009, an estimated 18,000 youth younger than 20 years were diagnosed annually with type 1 diabetes and another 5,000 were diagnosed with type 2 diabetes annually (Centers for Disease Control and Prevention, 2014). While diabetes was equally common in males and females, SEARCH researchers found ethnic differences. Rates of type 1 diabetes—the type of diabetes most common among children—were highest among white children. In contrast, rates of type 2 diabetes were highest among

American Indians, followed by black and Hispanic youth (Dabelea, Mayer-Davis, et al., 2014).

### What Are the Risk Factors for Diabetes?

#### Type 1 Diabetes

There are no clear risk factors for type 1 diabetes. Researchers believe that a combination of genetic and environmental factors puts people at increased risk for type 1 diabetes.

#### Type 2 Diabetes

Risk factors for type 2 diabetes include:

- being overweight (body mass index > 85th percentile for age and gender; weight for height > 85th percentile; or weight >120% of ideal for height),
- family history of type 2 diabetes in first- or second-degree relative,
- race/ethnicity—American Indian, African American, Hispanic/Latino, Asian American, or Pacific Islander,
- conditions associated with insulin resistance (hypertension, dyslipidemia, polycystic ovarian syndrome, or small-for-gestational-age birth weight),
- presence of acanthosis nigricans (where the skin around the neck or in the armpits appears dark and thick and feels velvety), and
- maternal history of diabetes or gestational diabetes during the child’s gestation.

Cases of type 2 diabetes in youth younger than 10 years (pre-pubertal) are rare. A child's health care provider may use clinical judgment to determine whether to test for diabetes in a child who does not meet the above criteria.

## What Are the Symptoms of Diabetes?

### Type 1 Diabetes

The onset of type 1 diabetes is usually abrupt. A classic presentation for type 1 diabetes is a lean child who is unintentionally losing weight and experiencing fatigue along with polydipsia, polyuria, polyphagia, and blurry vision. About one third of children with type 1 present with diabetic ketoacidosis (DKA), which can be life threatening (Dabelea, Rewers, et al., 2014). In addition to hyperglycemic symptoms, children with DKA may experience nausea and vomiting, abdominal pain, shortness of breath, fruity-scented breath, and confusion.

### Type 2 Diabetes

Some children or adolescents with type 2 diabetes may show no symptoms at all. In others, symptoms may be similar to those of type 1 diabetes. Other symptoms may include frequent infections and slow healing of wounds or sores. Some youth may present with a vaginal yeast infection

or burning on urination due to yeast infection. The onset of type 2 diabetes is more gradual, and because symptoms are varied, it is important for pediatric health care providers to screen youth who are at high risk for the disease (American Diabetes Association, 2015).

### Signs of Diabetes to Look for at School

In a school setting, teachers or school nurses may notice a child's weight loss and frequent requests to get a drink or use the restroom. Younger children may have bathroom accidents. Children may lack energy for play during recess or physical education class. Blurry vision may make it harder to see the chalkboard. Sometimes, children are perceived to be misbehaving or not following directions, but this is because they are simply too tired to do so. Nurses can talk to parents/guardians about symptoms that they have noticed, but a diagnosis must be confirmed with laboratory tests.

### How Is Diabetes Diagnosed?

For both type 1 and type 2 diabetes, there are four options for diagnosing the disease:

1. Hemoglobin A1C  $\geq 6.5\%$ ;
2. Fasting plasma blood glucose  $\geq 126$  mg/dL;

3. Random plasma blood glucose  $\geq 200$  mg/dL with symptoms of hyperglycemia; or
4. Oral glucose tolerance test with 2-hour plasma glucose  $\geq 200$  mg/dL.

Unless there are clear signs of hyperglycemia, results should be confirmed with repeat testing. Antibody testing should be performed to discern if a child has type 1 diabetes.

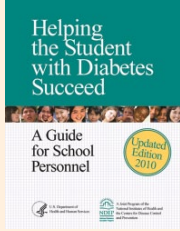
### For Family Members of Youth With Type 1 Diabetes

Measurement of islet autoantibodies in relatives of those with type 1 diabetes can help identify people who are at risk for developing type 1 diabetes. Such testing, along with education about symptoms of diabetes and follow-up in an observational clinical study, may allow earlier identification of onset of type 1 diabetes and reduce the chance of ketoacidosis at diagnosis (American Diabetes Association, 2015). This testing may be appropriate in those who have relatives with type 1 diabetes, in the context of clinical research studies such as Type 1 Diabetes TrialNet (<http://www.diabetestrialnet.org>).

### What Should Be Done After the Diagnosis?

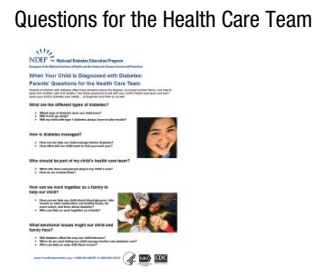
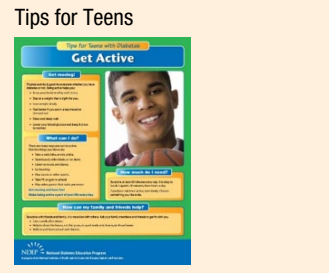

A new diagnosis of type 1 or type 2 diabetes can be devastating for the

**Table 1.** Federal Diabetes Resources for School Nurses

Resource	Audience	Purpose
	School nurses and other school personnel; students with diabetes and their parents and health care team	This comprehensive resource guide helps support optimal diabetes management in the school setting. It includes a thorough primer on diabetes care, including nutrition, and actions for various school personnel. It also includes an overview of applicable federal laws and samples of a Diabetes Medical Management Plan, Individualized Health Care Plan, and Emergency Care Plans for Hypoglycemia and Hyperglycemia.

(continued)

**Table 1.** (continued)

Resource	Audience	Purpose
 <p>Questions for the Health Care Team</p>	Parents of children newly diagnosed with diabetes	School nurses can share this resource with parents to help guide them through initial visits with their child's diabetes health care team.
 <p>Tips for Teens</p>	Adolescents with type 2 diabetes	School nurses can share this series of tip sheets with teens to help them manage their diabetes and reduce their risk for complications. This series encourages teens to take action to live a long and healthy life. Topics include: <ul style="list-style-type: none"> <li>• <i>What Is Diabetes?</i></li> <li>• <i>Be Active</i></li> <li>• <i>Stay at a Healthy Weight</i></li> <li>• <i>Make Healthy Food Choices</i></li> <li>• <i>Dealing With the Ups and Downs of Diabetes</i></li> </ul>
 <p>Overview of Diabetes in Children and Adolescents</p>	School nurses and health care professionals	This overview provides current statistics and care recommendations for youth with diabetes.

Note: Resources available at [www.yourdiabetesinfo.org/schools](http://www.yourdiabetesinfo.org/schools).

whole family. Children with diabetes will benefit from the care of a multidisciplinary team of professionals such as physicians, nurses, registered dietitians, diabetes educators, psychologists, and social workers.

School nurses are the most appropriate school personnel to assist children with diabetes, their parents/guardians, their teachers, and other school personnel in implementing the diabetes care plan at school. To assist school nurses, the National Diabetes Education Program provides a number of free resources developed by their Children and Adolescents Stakeholder Group. See Table 1 for a listing of key resources. For

additional information, visit [www.yourdiabetesinfo.org/schools](http://www.yourdiabetesinfo.org/schools). ■

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