

# *Managing **Diabetes*** *At School 2006*

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*Recommendations for the management of Diabetes  
For children and adolescents in school*

**Vermont Department of Health**  
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*The manual is designed to be copied and distributed to school staff, parents and other caretakers as deemed appropriate and is available online at <http://healthvermont.gov>*

## **ACKNOWLEDGEMENTS**

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## **PURPOSE**

This manual has been prepared as a resource for school staff and families caring for children and adolescents who have diabetes.

The Vermont Department of Health, Diabetes Prevention and Control Program (DPCP) was established to reduce the burden of diabetes for people with diabetes and their families. One compelling need identified through the DPCP is the management and safety of children and adolescents with diabetes in school.

Specific goals of the manual include:

- Ensuring that the health and safety of the student is maintained in the school setting through development and implementation of an Individual Care Plan (ICP) and training of school staff.
- Supporting the student in becoming independent with self-care management that is consistent with age and interest.
- Guiding school staff in their understanding of diabetes and its management, and assuring the coordination of diabetes care in school with the care provided in the home.
- Supporting student participation in school functions by removing barriers.

## CHAPTER 1. About Diabetes and Control

Diabetes is a chronic metabolic disorder, resulting in the body's inability to utilize glucose (sugar) for energy. The body either cannot produce the hormone, insulin, or it cannot effectively use the insulin it produces. Diabetes is not contagious. The cause is unknown, but appears to be a combination of genetic and environmental factors.

There are two major types of diabetes, type 1 and type 2.

**Type 1 diabetes** accounts for less than 10% of all diagnoses but is the most common type in school-aged children.

- previously called juvenile, or insulin-dependent diabetes, onset usually occurs in individuals under the age of 20
- it is an autoimmune disease in which the insulin-producing cells of the pancreas are destroyed
- treatment includes daily injections or continuous infusion of insulin with an insulin pump to maintain normal blood glucose levels along with attention to diet and exercise

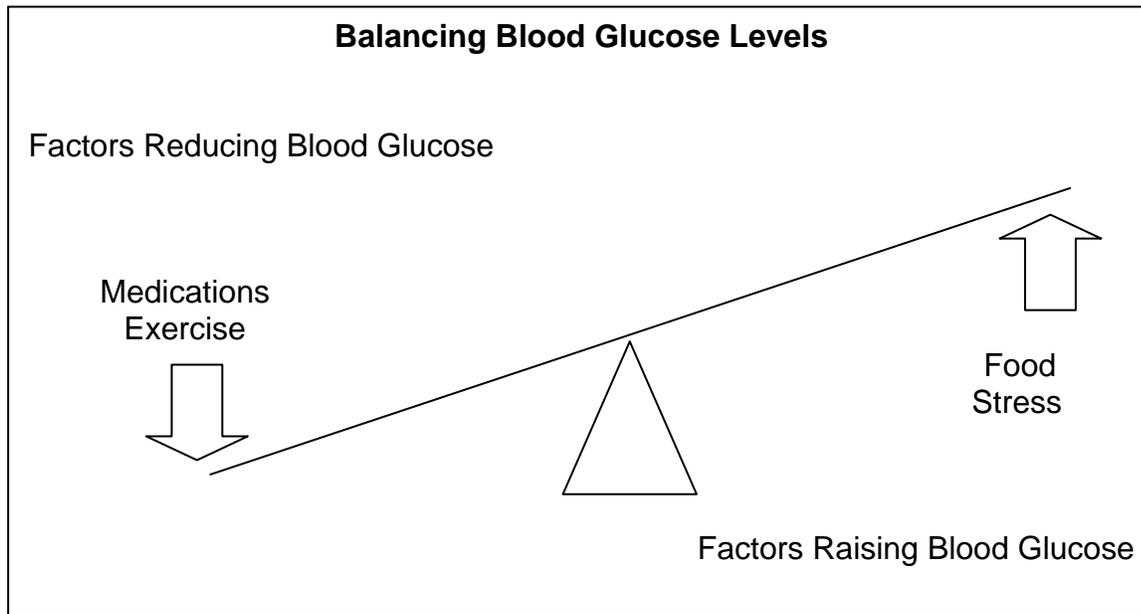
**Type 2 diabetes** is more common overall, accounting for more than 90% of diagnoses.

- previously called adult-onset, or non-insulin dependent diabetes its onset usually occurs in individuals over 40 years of age
- in recent years the incidence has increased in school-age children and adolescents, linked to increased levels of obesity
- is characterized by a resistance to insulin rather than a deficiency of the hormone
- treatment includes diet, exercise, and, for some individuals, medications that may include insulin

The information in this manual applies to both type 1 diabetes and type 2 diabetes.

## Control of Diabetes

There is no cure for diabetes so the treatment plan is directed at managing or controlling its course. This is achieved by balancing insulin or oral medications, food and exercise. Blood glucose monitoring enables people with diabetes to balance these three components of management and adjust one or more of them to correct or maintain target blood glucose levels.



Low blood glucose, *hypoglycemia*, may be caused by inadequate carbohydrate, alcohol consumption, too much insulin or more exercise than usual. Elevated blood glucose, *hyperglycemia*, may be caused by excessive carbohydrates, too little insulin, illness, stress or less exercise than usual.

The student's school performance will be optimized if the blood glucose remains in the target range as determined by the health care team. Left untreated, both high and low blood glucose levels can affect the student's ability to concentrate on schoolwork and participate in school activities.

## **TYPE 1 DIABETES**

In type 1 diabetes the body's immune system attacks its own insulin-producing cells in the pancreas and destroys them. With the destruction of insulin-producing cells, the body cannot make insulin and the person must take daily insulin to live. In some cases, there is a 'honey moon' phase during which time the body can make some insulin so only small amounts of external insulin are needed. This period can last from weeks to months.

### **Symptoms**

Symptoms usually develop rapidly, over a few days. The classic symptoms include increased thirst, increased hunger, increased urination, weight loss, fatigue and blurred vision. Left untreated, the condition can progress to a serious complication known as diabetic ketoacidosis.

### **Risk Factors**

Researchers are still trying to identify the exact cause of type 1 diabetes. A combination of genetic and environmental factors is involved.

## **TYPE 2 DIABETES**

### **An Emerging Health Problem for School Age Children and Adolescents**

Type 2 diabetes begins as a slow progressive process in which the body becomes resistant to its own insulin. Genetic factors, excess body weight, and physical inactivity can all play a role in the development of type 2 diabetes. In order to maintain blood glucose in the normal range, the body increases the production of insulin. During this period of high insulin levels, children may have few symptoms. Eventually, the pancreas is unable to meet the demands created by the insulin resistance.

Type 2 diabetes was once rare in childhood, but is now becoming increasingly common in American children and teenagers. Type 2 diabetes is more common in certain ethnic groups (African American, Hispanic, Native American, and Pacific Islanders). Unlike type 1 diabetes, it is more common in impoverished children. In some diabetes centers that serve high risk populations, type 2 diabetes comprises half of the new diagnoses. The epidemic of type 2 diabetes in childhood is related to the high prevalence of overweight American children and adolescents.

## Symptoms

Symptoms of type 2 diabetes progress over a number of months or years. High blood pressure, abnormal lipid values, excessive body weight, and *acanthosis nigricans* (dark, velvety textured skin found at the base of the neck, arm pits and groin area) can be precursors in the development of type 2 diabetes. Children and adolescents may also develop the classic signs of type 1 diabetes including excessive thirst and urination. Left untreated, this condition can progress to severe illness with dehydration, extremely high blood glucose and acidosis. *At the time of diagnosis, it can be quite hard to distinguish type 1 from type 2 diabetes.*

## Risk Factors

- Children over age 10 who have a body mass index (BMI) greater than the 85<sup>th</sup> percentile for age and sex (see BMI charts at end of appendices)
- Sedentary lifestyle
- Family history of type 2 diabetes (parent, aunt, uncle, or sibling)
- Ethnicity – higher risk in Hispanic, Native American, African American, Asian American and Pacific Islanders
- Presence of any signs of insulin resistance, including:
  - acanthosis nigricans (dark, velvety textured skin found at the base of the neck, arm pits and groin area)
  - polycystic ovarian syndrome
  - high blood pressure and abnormal blood lipids (low HDL cholesterol and high triglycerides)

Children and teenagers with a body mass index (BMI) greater than the 85<sup>th</sup> percentile, and two or more risk factors should be referred to their health care provider for further evaluation and a fasting blood glucose test. (American Diabetes Association. Consensus Statement: Type 2 Diabetes in Children and Adolescents. *Diabetes Care*, vol.23. no.3, March 2000, pages 381-389.)

Children and adolescents who are overweight or at risk of overweight may be at risk for developing *prediabetes or impaired glucose tolerance* which is a precursor to the development of type 2 diabetes. These individuals should be monitored and screened routinely.

In May of 2005 The Vermont Department of Health updated their *Provider's Toolkit* to include health screening recommendations for type 2 diabetes and pre-diabetes in children and adolescents.