

Resources

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Diabetes And How It Affects Children and Adolescents A Guide for Educators

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Glossary

Blood glucose level—the amount of sugar that is in the bloodstream

Blood glucose meter—a handheld test material that is used to check blood glucose levels in individuals with diabetes

Diabetic ketoacidosis—the poisoning that occurs from long periods of hyperglycemia. This condition can be fatal if left untreated.

Hyperglycemia—high blood glucose levels, or those levels above the predetermined range for that person

Hypoglycemia—low blood glucose levels, or those levels below the predetermined range for that person

Insulin—a hormone used to break down starches, sugars and food to convert them into energy for the body.

Self-talk—the act of speaking aloud to one-self, often seen in young children (2-6 years). Self-talk may be used as a coping mechanism for anxiety, or used to talk a child through conflict or problem solving. As children get older, they learn to do this internally.

Additional Resources...



On the Web:

- American Diabetes Association (ADA): <http://www.diabetes.org>
- The Center for Disease Control and Prevention, Diabetes Public Health Resource: <http://www.cdc.gov/diabetes>
- National Diabetes Information Clearinghouse (NDIC): <http://diabetes.niddk.nih.gov/>

Local Resources:

American Diabetes Association (ADA)
300 Penn Center Blvd. Suite 602
Pittsburgh, PA 15235
(412) 824-1181

Diabetes Institute, University of Pittsburgh Medical Center
(412) 864-0157
<http://diabetesinstitute.upmc.com>

Juvenile Diabetes Foundation
960 Penn Ave. #1000
Pittsburgh, PA 15222
(412) 471-1414
<http://www.jdrf.org>

Books for children:

Can Mom Have a Piece of my Birthday Cake? (2002) Written by: Rochelle L. Stern, Illustrated by: Rosalind Orland

Donnie Makes a Difference (1994) Written by: Sandra Haines, Illustrated by: Paul Hart

How I Feel: A Book About Diabetes (2003) Written by: Michael Olson

It's Time to Learn About Diabetes (1995) Written by: Jean Betschart, MN, RN, CDE, Illustrated by: Nancy Songer, RN, MSP, CPNP

Sugar Isn't Everything (1987) Written by: Willo Davis Roberts

Diabetes—What is it?

Diabetes is a chronic disease that affects the body's ability to make or properly use insulin. Insulin is a hormone used to break down starches, sugars and other foods to convert them into energy for the body.

When the body does not provide insulin, or is resistant to its effects, blood glucose (sugar) builds up and is excreted from the body through urine without using the available sugar for energy.

There are two forms of Diabetes: Type 1 and Type 2.

- *Type 1 diabetes* is typically diagnosed sometime during childhood or adolescence, but diagnosis may occur in individuals until the age of 40.
- *Type 2 diabetes* is a condition that, until recently, was only diagnosed in adults. However, more and more children are being diagnosed with type 2 diabetes.

According to the American Diabetes Association:

- Diabetes affects 1 in 400-600 children and teens in the US—Approximately 7.8% of population
- Nearly 2 million teens have pre-diabetes or are at risk for getting type 2 diabetes.
- Some minority populations are more predisposed to diabetes including African Americans, Hispanic/Latino Americans, American Indians and some Asian/Pacific Island Americans.

Did you know?

More and more children and adolescents are being diagnosed with Type 2 Diabetes, a traditionally adult prone disease.

Type 1 Diabetes



Type 1 diabetes is most commonly diagnosed during the child and adolescent years (9). It is a disease that affects the immune system. Typically the immune system destroys Beta cells, the cells used by the pancreas to produce insulin. Insulin is then used in the body to break down food for energy. However, in people with type 1 diabetes, the pancreas is unable to produce enough insulin, to break down food, requiring an daily outside source of insulin (9).

According to the American Diabetes Association (ADA), type 1 diabetes is less common than type 2 diabetes. It only affects about 7-10% of people with diabetes. There is no known cause for type 1 diabetes, but experts believe that genetics and environmental factors both play a role.

What are the symptoms of type 1 diabetes?

According to the ADA...

- ◆ Increased urination and thirst
- ◆ Constant hunger
- ◆ Weight loss
- ◆ Blurred vision
- ◆ Constant fatigue
- ◆ Symptoms often arise over a small period of time

Legal References

Three laws regulate a school's responsibilities to a child with diabetes(9):

- Section 504 of the Rehabilitation Act of 1973
- Americans with Disabilities Act of 1990
- Individuals with Disabilities Education Act

Children with diabetes will need a Section 504 Plan or an Individualized Education Program in order to have a plan in place where the student will receive proper treatment, and succeed in the classroom.

Section 504 plans and individualized education programs should include:

- Where and when the student should check their blood glucose levels
- Where supplies will be kept
- School personnel who can assist any accommodations that must be made
- What to do in a medical emergency
- Nutritional needs

Implications for Teachers

Teachers need to be aware of emotional, behavioral and attentional issues that may arise because of diabetes.

Immediately following diagnosis, there is a period (typically about 1 year) of adjustment both physically and emotionally. Teachers need to be supportive during this time.

Before jumping to conclusions about Attention Deficit (Hyperactivity) Disorder, Conduct Disorder or other believed disorders, it is important to check the blood glucose levels in the child. Pay attention to the physical and emotional symptoms of the child with diabetes, monitoring for any drastic changes.

Encourage snacking, when necessary, and healthy eating habits. Allowing children to feel a sense of independence may also help prevent Oppositional Defiance Disorder.

Present an environment in which the child with diabetes understands that you are an ally. Make the child feel comfortable coming to you with any feeling or problem that may arise.

Be supportive of any particular needs of the child by being informed. Understand the child's 504 Plan or IEP, and know what to do in case of an emergency.

The most important thing you can do as a teacher of a child with diabetes is to:

BE INFORMED!

Type 2 Diabetes



Type 2 diabetes is the most common form of the disease and has a tendency to develop over time (2). As we age, the body consistently requires more and more insulin to break down foods (9). Eventually, the pancreas cannot keep up with the demands for more insulin and may have trouble producing an adequate amount. Without enough insulin in the body, people with type 2 diabetes often control their blood glucose levels through insulin injections, oral medications or through food and exercise (2).

In the past, type 2 diabetes was typically found in adults who were overweight. Now, we are starting to see more and more children and adolescents developing type 2 diabetes (9). Experts believe this is based on children being more overweight and less active than in the past. Type 2 diabetes can be prevented by leading a healthy lifestyle, maintaining a healthy weight and getting plenty of exercise (2).

If someone in your family has developed type 2 diabetes, or if you are overweight yourself, your chance of developing type 2 diabetes increases (2). The following minorities are also at more risk of contracting the disease (2): African Americans, Hispanic/Latino Americans, American Indians, and some Asian Americans and Pacific Islander Americans.

What are the symptoms of type 2 diabetes?

The ADA highlights symptoms to look out for; however, often times, people with Type II Diabetes do not exhibit any signs.

- ◆ All symptom associated with type 1 diabetes
- ◆ Frequent infections
- ◆ Blurred Vision
- ◆ Cuts/Bruises that are slow to heal
- ◆ Tingling/Numbness in the hands and feet
- ◆ Recurring skin, gum, or bladder infections

How is diabetes regulated/cared for?



Blood glucose levels must be monitored throughout the day using a blood glucose meter, especially at mealtimes. A small needle pokes the skin, causing blood to draw to the surface. This tiny drop of blood is placed on a small stick that gets inserted into a meter. The meter will give a reading of the glucose present in the blood. This numeric reading is then compared to the range of target blood glucose levels for that individual. If the levels are too high, more insulin is needed to lower the blood glucose levels. If the level is too low, the student may need to eat or drink something, or take a glucose tablet to raise blood glucose levels.

Diabetes is regulated through the use of insulin (for both type 1 and possibly type 2), medication (type 2), food, and exercise (2). Insulin may be given through the use of a permanent insulin pump or through an insulin shot.



What do teachers need to know about diabetes care during the school day?

- Children with diabetes will need to monitor their blood glucose level throughout the day. Younger children, especially, will need assistance in this task.
- Typically the school nurse is the most appropriate person to handle this, but a trained teacher or other school personnel may also be of assistance.
- The guidelines for helping a student manage their diabetes should be included in a Section 504 plan or an Individualized Education Program. These plans should be shared with all personnel involved with the child.
- Allow children with diabetes unlimited access to bathrooms and water fountains.
- Allow children with diabetes to keep a snack or juice available at their desk.
- Know and monitor the symptoms of hyper/hypoglycemia.
- Excuse absences related to required medical appointments.

What Impact Does Diabetes Have on Children (Cont.)?

poorer glycemic control.

Adolescent girls with diabetes are at risk for eating disorders (Daneman, Olmsted, Rydall, Maharaj, & Rodin, 1998). To help prevent this, proper eating habits should be taught at a young age and encouraged through adolescence.

Emotional Implications

Having a chronic illness can make a child feel excluded or different from their peers. This feeling of inequality can negatively impact a child's psychosocial development (Yu, 2000). Because depression and anxiety disorders may be found in conjunction with diabetes, it is important for a teacher to treat a child with diabetes the same as he/she would treat a typical child. Children do not want to feel different or alienated. Both of these are risk factors that can lead to depression and anxiety.

Cohen, Lumley, Naar-King, Partridge, & Cakan (2004) found that children with diabetes who exhibited externalized behavior problems (specifically delinquency and aggression) did not have good glycemic control. Externalizing behaviors often lead to poor behaviors related to diet and the use of insulin. These externalized behavior problems can cause high levels of stress, which can be detrimental to those with diabetes. Because stress levels can cause a fluctuation in blood glucose levels, these behaviors ultimately want to be avoided.

Having a chronic illness causes high levels of stress for children and adults. However, having good coping strategies (or being taught how to cope successfully) can help lower stress levels. Children who use emotional coping strategies, such as avoidance or distraction to handle diabetes, often have poorer metabolic control and self-care (Boland & Grey, 1996). When children use cognitive coping strategies, such as self-talk, they are more successful at coping with diabetes.

What Impact Does Diabetes Have on Children?

School Attendance

Children with diabetes can be expected to attend school regularly, just like their peers, but may miss approximately three more days per school year (Glaab, Brown, & Daneman, 2005). These absences are often related to diabetes upkeep and doctor appointments. However, children with poorer diabetic control may miss more days of school.

Children with diabetes may miss up to 3 more days per school than their peers.

Having trouble focusing? Check for low blood sugar levels. Having stable blood glucose levels can aide in the ability of children with diabetes to pay better attention in class (Daley, Woodrich, & Hasan, 2006). A study completed by Rovet & Alvarez (1997) found that children with early-onset diabetes had poorer select attention, difficulty with inhibition and focus.

When children with diabetes are having trouble attending or focusing on tasks during the school day, one possible reason may be hypoglycemia.

Behavioral Implications

In a study completed by McCarthy et. al.(2002), children with diabetes showed greater difficulty with compliance, inconsistent moods, and more fatigue than their siblings. Mealtime misbehaviors can be commonly found among children with diabetes. In a study by Wilson, DeCoursey & Freeman (2009), parents reported that when children with diabetes misbehave at mealtime, they worry more and more time is being sent caring for their child's diabetes. Children who misbehave at mealtimes and have parents who overreact to their behavior may have

Encourage good eating habits to avoid mealtime misbehaviors and eating disorders among children with diabetes.

What happens when blood glucose levels are too high or too low?

When a student's blood glucose levels become too high or too low, the student needs immediate medical attention. This may include taking insulin, eating or drinking, or taking glucose tablets to regulate blood sugar levels. According to a study by Schmitt, Wodrich & Lazar (2010), it is important for teachers to know these symptoms in order to provide medical attention when necessary. Teachers can make appropriate accommodations to avoid these diabetic states when they are properly informed.

Symptoms of hypoglycemia (low blood glucose levels)(9)

- Shaky
- Sweaty
- Hungry
- Pale
- Headache
- Blurry vision
- Sleepy
- Dizzy/weak
- Confused/disoriented
- Uncoordinated
- Irritable or nervous
- Inability to concentrate
- Noticeable change in behavior
- Seizure*
- Inability to swallow*
- Unconscious*

* These are severe symptoms, which do not often happen if the hypoglycemia is addressed with first symptoms

Symptoms of hyperglycemia (high blood glucose levels)(9)

- Increased thirst
- Frequent urination
- Nausea
- Blurry vision
- Fatigue
- Hyperglycemia over the course of a few days can lead to diabetic ketoacidosis (DKA) with symptoms of nausea, vomiting, and high levels of ketones in the bloodstream and urine, requiring serious medical attention.

Common

Misconceptions

After polling the general public, here are some common misconceptions about diabetes...

Myth

Children with diabetes cannot participate in rigorous, physical activity.

Fact: Children with diabetes should participate in physical activity daily. However, they will need to regulate their insulin based on the amount and length of exercise they complete. (9)

Myth

Children with diabetes cannot eat anything containing sugar.

Fact: Children with diabetes can eat anything a child without diabetes can. However, all parents should be monitoring their children's sugar intake and promote healthy eating habits. (9)

Myth

Children with diabetes are not capable of monitoring their blood glucose levels and administering insulin.

Fact: Older children are capable of completing blood glucose scans and administering insulin when properly taught. Children and adolescents should be monitored to ensure proper diabetic care.

Myth

If I eat too much sugar, I will develop diabetes.

Fact: Sugar does not ultimately cause diabetes. However, being overweight (which can be caused by eating many sugary or processed foods) can be a risk factor. Other common components further influencing one's risk include genetics, environmental factors and ethnicity. (9)

Myth

Because I am overweight, I will eventually develop type 2 diabetes.

Fact: While being overweight is a risk factor for type 2 diabetes, genetics and ethnicity also play a role in the development of type 2 diabetes. Being overweight does not guarantee that you will develop diabetes.

Myth

Only people who are overweight can get diabetes.

Fact: Even people who maintain a healthy weight are at risk for diabetes. Type 1 diabetes is not caused by being overweight. It is a disease of the immune system.

John's Story

John, a seven-year-old boy, has recently been recommended for special education services. His teacher notices that he has been having difficulty focusing, appears confused at times, is uncoordinated, and often appears irritable. He asks to go to the bathroom or to get a drink at inopportune times. His teacher has begun to think that this is an avoidant behavior to evade schoolwork. Before lunch, John frequently gets into fights with his classmates, but reconciles with these peers after lunch. His teacher is concerned because John's school work is beginning to suffer, and relationships with his peers appear strained at times.

While completing a teacher report for services, John's teacher begins to notice that his major attention issues (inattention, difficulty focusing and irritability) occur mostly before lunch and at the end of the school day, after John has gone for long periods without anything to eat.

After completing a bit of simple research, John's teacher discovers the symptoms of type 1 diabetes. She discusses John's symptoms with the school nurse, who confirms that it sounds like John is suffering from hypoglycemia, or low blood sugar levels, especially if these symptoms are appearing progressively closer to mealtimes.

The nurse at John's school makes a call to John's parents, recommending that he be seen by his physician. After seeing the pediatrician, it is confirmed that John has been suffering from hypoglycemic episodes due to type 1 diabetes. His doctor is now working on educating John and his parents on the care and regulation of type 1 diabetes. The more stable his blood glucose levels have become through regulation, the more John's school work and peer relations continue to improve.