Helping Students with Diabetes Management

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Every year there are thousands of walks to raise funds for diabetes research. Diabetes is still on the rise in the United States and currently costs more than $132 billion in healthcare costs and lost wages (ADA 2003). It is the number-two chronic illness managed in our schools (second to asthma) and will be a growing presence (ADA 2000b).

According to the American Diabetes Association (2002b), there are about 125,000 students under the age of 19 with diabetes in the United States. By law, each of these students should have full access to all school activities, be permitted to manage their chronic illness, and receive assistance if required.

Unfortunately, students with diabetes sometimes experience discrimination. There have been cases in which daycare centers have refused to admit children with diabetes and secondary school students have not been allowed to monitor their blood glucose level in the classroom or to eat required snacks on the school bus.

Preventing students from managing their blood sugar is dangerous. The Diabetes Control and Complications Trial evaluated the effects of intensive diabetes
management for adolescents and adults with insulin-dependent diabetes (type 1) and demonstrated that when people achieve consistent blood glucose control, they have a higher quality of life with fewer long-term complications (Diabetes Control and Complications Trial Research Group 1993).

Educators must provide a school environment and resources to ensure the adequate care of students with diabetes. This is not only a question of ethics, but of law. Three federal laws enacted to safeguard students with a chronic illness — Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and the Individuals with Disabilities Education Act of 1991 — apply to students with diabetes.

The first section of this fastback presents an overview of diabetes, the importance of blood glucose control, and how to help healthcare professionals, educators, parents, and the student work together to create a comprehensive healthcare team and a seamless healthcare environment. The second section describes the specifics of diabetes management. The next section surveys diabetes management in the current school environment, including legal responsibilities and school policies. Finally, specific models and guidelines for student diabetes management are introduced, based on the standards of the American Diabetes Association, the Juvenile Diabetes Research Foundation, and the Office of Civil Rights.
Controlling Diabetes

Diabetes is a serious chronic illness. It is the fifth leading cause of death by disease in the United States and a major cause of heart attacks, strokes, blindness, nontraumatic amputations, and kidney failure (ADA 2003). The hallmark of the illness is high blood glucose (sugar), which is caused by a deficiency of, or resistance to, one's own insulin. Insulin is the hormone produced in the islet cells of the pancreas that enables the body to use glucose, one of the products of food, for growth and energy. When there is not enough insulin in the blood or the body resists using its own insulin, the glucose cannot move from the blood to the cells. The individual's cells starve, and the blood sugar levels become elevated. Years of chronic high blood sugar levels negatively affect every major organ system of the body.

Most young people with diabetes have type 1 diabetes, even though it constitutes only 10% of the diabetes population. The illness is not contagious, and there is nothing a person or family can do to prevent it. It most likely is caused by a genetic autoimmune disease that causes the body to destroy its own islet cells. When a student has this form of diabetes, the student's pancreas
does not produce insulin, and the student must receive insulin either by injections or an insulin pump.

Unless a cure is found, students with type 1 diabetes must receive exogenous insulin for the rest of their lives. Exogenous insulin is intended to imitate the body's normal release of insulin from the pancreas to maintain a normal blood glucose level. By balancing insulin dosage, meal planning, and exercise, it is possible to minimize both high (hyperglycemia) and low (hypoglycemia) blood glucose levels.

While students with diabetes are most likely to have type 1 diabetes, the most common type is type 2 diabetes. Type 2 diabetes most often occurs in individuals over 40, but it can be found in young people (ADA 2000a). If it does occur in a young person, that individual is often obese and has a family history of diabetes. People with type 2 diabetes do produce their own insulin, but the body is not able to use the insulin effectively. Students with type 2 diabetes often are able to control their diabetes by a healthy diet and exercise, but they may require oral medication, insulin injections, or both. Students with type 2 diabetes must carefully monitor their meals, exercise, and medications to help control blood glucose levels.

The most immediate health concern for students with diabetes is low blood sugar, or hypoglycemia. Low blood sugar results from having too much insulin for the amount of glucose in the blood. Causes include delaying a meal, not eating enough food, and not making appropriate food or insulin adjustments for physical activity.

A severe low blood sugar reaction is characterized by the individual needing assistance to eat or drink, be-
coming unconscious, or having a seizure. Preventing severe low blood sugar reactions is extremely important, especially for children under seven years of age. If a young student has frequent severe low blood sugar episodes, the growth of the brain can be affected and, as a result, the student may have a lower IQ than normally would be expected. Severe low blood sugar often can be prevented by allowing the student to eat snacks and meals on time and through early detection and treatment of mild low blood sugar.

Mild low blood sugars are common. However, the student can become preoccupied with activities and not notice the early signs of mild low blood sugar. When a young child, in particular, does experience a low blood sugar reaction and is treated, the teacher and the student should take time to reflect on the event and talk about the way the child felt during the low blood sugar reaction. This will help the young student learn how to recognize the early warning signs.

Early signs of low blood sugar include the inability to concentrate, irritability, heart racing, headache, sudden perspiration, hunger, pallor, weakness, nervousness, shakiness, and numbness, especially around the mouth and tongue. Moderate to severe signs include mental dullness, severe drowsiness, slurred speech, staggered walk, blurred or double vision, glassy eyes, confusion, amnesia, combativeness, and uncontrolled crying. The signs of extreme low blood sugar are loss of consciousness or seizure. Teachers need to learn which early signs are likely and the required treatment for each of their students with diabetes. This information should be
available from the student’s parents or guardian or the student’s healthcare plan and should be presented during care-provider training.

High glucose levels also need to be controlled. Causes include too little insulin, too much food, insufficient exercise, stress, or illness, such as a cold. High blood sugar levels do not create the acute reactions associated with low levels; however, the long-term consequences in preadolescence can include stunted growth and the delay of puberty.

High blood sugar can impair a student’s concentration. For example, students who fall asleep after eating lunch usually are experiencing post-meal high blood sugar. When such reactions affect a student’s academic performance, they should be discussed with the student. Teachers then should contact the student’s parent or guardian if no improvement is observed. If students are eating a balanced lunch and still experience high blood sugar reactions, they may need to have their insulin dosages adjusted.

Another warning sign of increased blood sugar is the presence of ketones. The body produces these compounds when blood sugar is high, and they can be detected when passed out of the body. When the student experiences high blood sugar sufficient to produce ketones in the urine, the parents should notify the school so that teachers can encourage the student to drink more water than usual. This also means that the student will use the restroom more often. It is imperative that students with diabetes be given free access to water and the restroom.
A normal physiological response to high blood sugar is a fluid shift in the body from intracellular to extracellular to try to thin the thick, sticky blood. The kidneys filter out the excess blood volume, thus causing the need to urinate more often. The student needs to keep adequately hydrated when this occurs in order to prevent dehydration. Also, the thirst center in the brain is stimulated and the student craves fluids. Water is the fluid of choice at this time. Diet sodas also can be used, but they should be caffeine free because caffeine can speed dehydration.

If symptoms of high blood sugar persist over a period of days, the teacher should notify the parent and the school nurse. If untreated, high blood sugar can cause diabetic ketoacidosis (DKA), a serious condition that produces severe dehydration, nausea, vomiting, and a high level of ketones in the blood and urine. This alters the acid-base balance in the body. If it is not treated, DKA can lead to coma and death.

The Healthcare Team

While people with an acute illness, such as influenza, can be cured, people with chronic illnesses are seldom cured and require treatment for the rest of their lives. Chronically ill students should have a healthcare team that includes school personnel, parents or guardians, the healthcare provider, and, of course, the students themselves. Each member of the team has a responsibility to help the student maintain a daily routine to control the disease and improve the student’s quality of life.
Although the members of the student's healthcare team have different functions to perform, they do not function independently. The team members must work together to provide an environment of seamless care. For example, a parent might inform the school that the student's last two blood glucose readings were high. The teacher would then better understand if the student were lethargic, thirsty, had to go to the restroom more than usual, and had to take extra insulin. In a like manner, a teacher noticing these symptoms could inform the parent that the student was exhibiting symptoms of hyperglycemia. If the symptoms persisted, the healthcare professional might need to adjust diet or insulin dosage and watch the student to be certain that the insulin was taken in the prescribed manner. When each member of the student's healthcare team functions as an integral part of the whole, the student can maintain normal or near-normal blood glucose levels, achieve academic success, and reduce the risk of diabetes-related complications (Scott 2002).

For students with diabetes, such organizations as the American Diabetes Association (2002a), the Juvenile Diabetes Research Foundation (2001), and the Diabetes Research and Wellness Foundation (2002) have published guidelines and responsibilities for healthcare team members. Following is an outline of responsibilities based on their recommendations:

*Parent/Guardian*

- Provide all materials and equipment necessary for diabetes care tasks.
• Maintain such equipment and keep supplies stocked.
• If indicated, provide an extra log book to record blood sugars taken at school and how often the parent wants the data sent home.
• Provide snacks and supplies to treat low blood sugar.
• Provide information about the child’s performance of diabetes tasks.
• Furnish emergency phone numbers.
• Provide a meal and snack schedule, plus information on how to handle parties and other activities at school.

**School or Daycare Provider**

• Verify that all adult healthcare team members are trained on the symptoms and treatments of low and high blood sugar and on emergency procedures.
• Verify that an adult and an alternate are trained to monitor and record blood glucose levels and ketone levels in urine and to take appropriate actions when readings are out of range.
• Provide the student with immediate access to treatment.
• Verify that an adult and alternate are trained to administer insulin.
• Verify that an adult and alternate are trained to administer a glucagon emergency injection for extreme severe lows.
• Allow the student to test his or her blood sugar, treat lows, and administer insulin wherever and whenever it is necessary.
• Ensure that a trained adult and an alternate are familiar with the student’s schedule and can work with the parent or guardian to coordinate the student’s schedule with that of other students. The trained adults will notify the parent/guardian of any schedule changes that affect the meal or snack times. Young children will have to be reminded of snack times.
• Permit the student to see school medical personnel on request.
• Permit the student to eat a snack to prevent or treat lows anywhere or anytime, including on the school bus.
• Permit the student to miss school without consequences for required medical appointments. This should be an excused absence with a doctor’s note.
• Allow the student to use the restroom and to drink water as necessary.
• Provide an appropriate location to store insulin and glucagon if necessary.

**Student with Diabetes**

• The student should be learning self-management skills according to his or her readiness. Following are some general guidelines.

  *Preschool and Day Care.* By age 4, cooperation is expected for the diabetes tasks, but children generally are unable to perform tasks independently.

  *Elementary School.* Cooperation in all tasks is expected. Most children are assisting or performing own fingersticks by age 8 with supervision. Some
are beginning to do their own insulin injections; and by age 10, most can inject themselves with supervision.

*Middle School or Junior High.* Most students this age should be able to perform their own insulin administration and self-monitoring of blood glucose with supervision as long as they are not experiencing a low blood sugar.

*High School.* All tasks should be performed with accuracy and skill without supervision unless the student is experiencing low blood sugar or is untrustworthy.

**Healthcare Provider**

- Provide written information to the school or daycare provider regarding the student’s diabetes management and care.
- Be available to assist with the care of the student, including helping with diabetes education and diabetes management.

**Health Information and Communication**

For the healthcare team to function effectively, communication must flow seamlessly and each team member should have access to required information.

Communication of health information must conform to the requirements of the Health Insurance Portability and Accountability Act (HIPAA) of 1996. According to HIPAA definitions, the members of the healthcare team are considered healthcare providers, and thus any oral
or recorded health information must comply with the act’s provisions. The shared information must enable each member of the healthcare team to protect the student’s health without violating the student’s privacy.

It is best when communication with the school is initiated by the parents and student and there are signed documents in place that permit the required flow of communication to all involved on a “need to know” basis. Often, there is discussion regarding what communication is required and what information each member of the healthcare team actually needs to know.

Accommodation is frequently necessary. For example, a parent may want to be called regarding the glucose level every time the student does a blood sugar check during the school day. This is not a reasonable request, because the school does not have the time or manpower to call the parent at every blood sugar check. Because the school’s main task is to educate the student, a more reasonable request would be to establish guidelines in the Individual Healthcare Plan (IHP) that indicates when parents are to be notified, such as severe lows where the student needed assistance or highs with ketones present. If the school is responsible for the blood sugar tests, a log should be kept and the results should be communicated to the parents as written in the IHP.
Managing Diabetes

The goal of every diabetes management procedure is the promotion of normal growth and development and the prevention of long-term complications, such as eye, kidney, nerve, or heart disease, that are caused by poorly controlled diabetes.

Daily Management

Most young people diagnosed with type 1 diabetes go through a "honeymoon" period shortly after beginning treatment with external insulin. The students' functioning islet cells begin to produce a significant amount of insulin. This honeymoon period can last from a few weeks to even a couple of years. Eventually, however, all the islet cells in the body cease producing insulin; and the insulin injection regimen must be adjusted.

After the honeymoon period, students' insulin regimens often have to be adjusted periodically. That is because the body is continually changing, and the current insulin regimen might not maintain proper blood sugar levels.

The conventional method for treating students' diabetes includes one or two shots of insulin a day, usually
a mix of two different types of insulin. With this regimen, it is very important for the student to adhere closely to the timing of meals and snacks and to the meal plan indicated by medical nutrition therapy. By timing the insulin injections with exercise and the intake of food, the student is able to maintain blood sugar levels in the normal range and to prevent complications related to diabetes.

If conventional therapy does not meet goals, then most people decide to move to an intensive management regimen. Intensive management involves either a multiple daily injection (MDI) regimen or the use of an insulin pump that provides continuous insulin. In either case, it works much better if the student learns to count carbohydrates and to adjust insulin doses accordingly. If the student is too young to perform this task, then school personnel should assist the student.

Often, the cafeteria manager can assist with calculation of carbohydrates in school lunches. If the student packs a lunch from home, the parent can include a note with the carbohydrate count on the food items. Again, this task should be made as simple as possible, be reasonable for the school to handle, and be delineated in the IHP.

**Future Advances**

Diabetes research and technology are making advances daily. Currently researchers are developing a completely internal, continuous, blood glucose sensor and an internal artificial pancreas that communicate with each other to deliver insulin continuously according to
the person's blood sugar. There also is much research on islet cell transplantation to provide a cure for type 1 diabetes.

Technology is providing new diabetes management tools every year. Many insurance companies, Medicare, and Medicaid have learned that paying money for more effective diabetes management tools saves money in the long run and prevents hospitalizations and long-term diabetes complications.

Soon, children of all ages with type 1 diabetes will wear insulin pumps. There is nothing currently on the market that provides better control and flexibility than does an insulin pump. While multiple daily injections can mimic pumping, the amount of insulin in the blood cannot be decreased once it has been injected. An insulin pump allows the amount of insulin to be "turned down" to prevent blood sugar lows when the student wishes to engage in extra physical activity.

An insulin pump is about the size of a pager and can be programmed like a computer to deliver a specified amount of rapid-acting insulin every few minutes throughout the day and night. This basal rate meets the student's physiological needs for insulin. The student then learns to push appropriate buttons on the pump to bolus insulin before eating and to correct a high blood sugar. The insulin is delivered through a tiny soft tube and cannula that the student wears in the abdomen, hip, or thigh. The pump cannula (or set) is changed by the student or parent every two to three days. The student and parents go through pump training with a diabetes educator who is a certified pump trainer. The level of
help the student needs with the pump depends on his or her developmental level, and this should be delineated in the IHP. Designated school personnel may have to go through training in this area.

Bloodless meters also are being developed, and there is one already on the market. However, the bloodless meters have limitations that need to be addressed.
Diabetes Management in the School

Effective diabetes management in the school requires communication and individualization. There must be clear communication among all members of the healthcare team. For example, the doctor or parents might change the student’s insulin dosage to adjust for growth and development or changes in the student’s activities. The school nurse must have a physician’s order in place quickly to accommodate these changes. Traditionally, the school nurse must fax the order form to the physician or diabetes educator and then wait for several weeks to get the signed order back. Communication would be much less frustrating if the diabetes medical team would simply write the order, sign it, and send it with the parents or fax it to the school.

To provide the required individualization, parents should request an Individualized Health Plan (IHP) at the beginning of the school year, when the child enters the school system, or at time of diagnosis. The IHP spells out the responsibilities of the parents and the school and gives an opportunity to detail the student’s diabetes needs. If the student does self-management and does not need any routine assistance, an IHP will state this;
but it also will allow for proper actions in case of an emergency.

Schools may not have a full-time school nurse, or a nurse may be shared among several schools. However, the school nurse still is responsible for the health accommodations of all students with healthcare needs. This is why the American Diabetes Association recommends that at least two adults in every school be trained in diabetes care and emergencies. The school nurse is responsible for this training, and it is recommended that the parents and medical team also be involved.

**Legal Responsibilities**

Federal law requires that every public school provide adequate services for students with diabetes. Under Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA), and the Individuals with Disabilities Education Act (IDEA), diabetes is considered a disability, and students with diabetes are legally protected from discrimination.

Section 504 is the law most often cited for protecting students. It requires public and private schools that receive federal money to provide disabled students with an appropriate education in the least restrictive environment. Schools must provide equal opportunity for the student to participate in nonacademic and extracurricular activities and also must provide the student with needed services to ensure that the student is medically safe.

Title II of the Americans with Disabilities Act expands the scope of Section 504 to include all public entities,
such as state or local governments and any of their departments or agencies. For example, a charter school might claim that it does not receive federal money and does not have to comply with Section 504. However, a charter school is a government entity and, under Title II, may not discriminate against a student with diabetes. Private parties may bring lawsuits to protect their rights under Title II and receive the same remedies available under Section 504. The U.S. Department of Education is designated to enforce Title II requirements for education institutions.

The third federal law that addresses students with diabetes is the Individuals with Disabilities Education Act (IDEA). Formerly called the Education for All Handicapped Children Act of 1975, IDEA requires that all public schools provide all eligible students with disabilities a free appropriate public education in the least restrictive environment appropriate to their individual needs. To be eligible, the student's diabetes must impair learning to the level that the student requires special education. The public school must then create a suitable Individualized Education Program (IEP) that describes the special education and services the student requires. The IEP should be developed by the student's healthcare team and reviewed annually. At the minimum, the healthcare team should include the teacher, parents, medical representative, special education representative, and the student, when appropriate. Parents who disagree with the suggested IEP may request a due process hearing with their state's education agency or the courts.
Even with these federal laws, there are many instances where students with diabetes are not allowed to perform basic diabetes management in school. For example, in Washington State the education environment was so restrictive that doctors recommended that their student patients run their blood glucose levels higher during the school day to prevent life-threatening lows (ADA 2002b). Fortunately, on 3 April 2002 the Washington governor signed Senate Bill 6641, which enables students with diabetes to manage their illness at school. The bill requires that each school have staff trained in diabetes management and emergency procedures and that students with diabetes have an individual health plan that outlines specific medical needs. Also, the school district, a school staff member, or designated adult is protected from legal liability when providing assistance in accordance with the student’s healthcare plan.

Two other states that have passed laws to protect students with diabetes are North Carolina and Tennessee. In North Carolina, the state legislature unanimously passed the Care for School Children with Diabetes Act on 29 August 2002. The legislation requires that the North Carolina Board of Education adopt guidelines, based on American Diabetes Association recommendations, for the care of students with diabetes. Tennessee already had a law regarding the care of students with diabetes; however, in 2002 it was amended to allow the administration of glucagon by someone other than a nurse. Prior to passage, only nurses were permitted to administer glucagon; but there was not always a school nurse available. Tennessee Senate Bill 2525 allows
school personnel who are trained through the Tennessee department of health to give glucagon.

Even when state legislation does not mention the care of students with diabetes, educators in that state must satisfy Section 504, the ADA, and IDEA. In addition, though local school districts usually have the autonomy to develop their own policies, those local policies cannot conflict with state or federal law. For example, many schools have policies that prohibit students from carrying medications. However, a student with diabetes must carry medication in order to properly self-manage his or her diabetes. In these cases, the school must adjust their policy to allow the student to have immediate access to the required medication.

The Individualized Health Plan

There is no universal form for an Individualized Health Plan (IHP). If the document is adequate for the student’s health needs, it is acceptable. Some states have adopted a particular format for an IHP, and the American Diabetes Association has a template available.

A properly developed IHP should be flexible so that it can accommodate a variety of situations. However, it also should be precise, delineating the responsibilities of the parent or guardian, the student, and the school. The diabetes IHP should include the following:

- The frequency and circumstances of blood sugar monitoring.
- The level of participation in diabetes care by the student.
- Care and storage of insulin or glucagon at school.
- Dosage and administration of insulin if the student requires assistance.
- When meals and snacks are required, along with the amounts and types of foods.
- Accommodations for parties and extra food at school.
- The student’s most common signs of low blood sugars, the proper treatment, and the location of supplies.
- Emergency procedures, including phone numbers and other contact information.
- The student’s most common symptoms of high blood sugars and proper treatment.
- Procedures for testing for ketones at school and the appropriate actions if the test is positive.
- Accommodations for sports and extra exercise.

Many students dealing with chronic illnesses mature much faster than do ordinary students. These students grow to accept their responsibility at an early age and learn to take care of themselves. There also are some students who need daily supervision. Thus each IHP should delineate the level at which the student can take care of his or her needs.

Self-Management Issues

Creating the least restrictive environment for a diabetes student includes allowing for self-management. Some students will be fully independent, especially in the higher grades, while others will need some super-
vision by trained staff for parts of their management routines, which should be outlined in their IHPs.

Many students, particularly high school students, want to keep their diabetes private. They may come into the office or health room to inject or test blood sugar in private. Other students acknowledge their diabetes and have no problems testing or injecting in public. However the student decides to manage his or her diabetes tasks should be supported in the IHP and by the school staff.

Young students may need help with testing for blood sugar, injecting insulin, bolusing insulin with the pump, or even recognizing and treating lows. School staff should be trained to accommodate the child. Parents are most often involved with the training, and the school nurse should be involved and should document the process. If there are any questions regarding procedure or care, the medical team should be called to assist.

All school personnel do not need to be experts on diabetes management. Whatever is required of staff to assist the student in self-management should be expressed in the student's IHP. However, it is important that at least two school staff members be trained in diabetes management and emergencies.

**School Policy**

Probably the most common diabetes management concerns for schools are students carrying medications and needles and the possibility of blood exposure to others. Schools do need to address these concerns. How-
ever, if the school does not accommodate the student with diabetes, it creates the potential for litigation.

Many students with diabetes carry their insulin with them in order to manage blood glucose and food situations wherever they are. Some students have their glucagon emergency kit with them at all times so that a severe low can be treated quickly. However, most schools require that all medications be locked up in the office or health room. While this is a reasonable safety concern, students dealing with chronic illnesses need to develop a lifestyle that fits disease management into their lives as unobtrusively as possible, which means the tools and medications have to be readily available.

In addition, students with diabetes need to have their tools and medications with them because school routines often are interrupted. There are special programs and assemblies, fire drills, bomb threats, lockdowns, early dismissal due to weather, and other unexpected events during which a student may not have immediate access to needed treatment. Accommodations need to be in place for all types of situations.

Carrying sharps has become a major issue not only for schools, but also for air travel and many other situations. The security procedures of the Federal Aviation Administration have addressed accommodations specifically for people with diabetes (FAA 2002). In the schools, the IHP should address what the student needs to carry at all times. Students who are self-managing their diabetes need to carry a blood sugar meter and a lancing device and, if using intensive management, also an insulin pen that has a disposable needle. The student
can leave the lancet in the lancing device, and the disposable needle on the insulin pen can be kept in the student’s pen pouch. These precautions keep self-managing students from exposing others to the sharps.

When the student performs a blood glucose test, he or she needs to prick a finger, hand, or arm to obtain a small drop of blood. Students with diabetes do this test many times a day and take care of the testing supplies and stopping the bleeding without any difficulty. The used test strip and lancing device can be kept in the pouch with the meter, and the student can clean them at home. Most meters are silent and will not disturb the class, and some now can test the blood in five seconds. Thus students can manage the test very easily at their desks and not interrupt the class. Those who need assistance can be provided a place in the classroom to test with the teacher’s or teaching assistant’s supervision. The specifics should be addressed in the IHP.
Sample Individualized Health Plans

Most teachers want to safeguard students with diabetes and fulfill the legal requirements. To aid schools in this process, the American Diabetes Association, the Disability Rights Education and Defense Fund, and the Office of Civil Rights have developed guidelines and models for student diabetes management.

The Section 504 Plan

The Section 504 plan is an agreement, usually signed by a physician, parent or guardian, and a school official, intended to ensure that the student with diabetes has full access to the education program. School accommodations and modifications are prescribed in the 504 plan to ensure that the student with diabetes has the same academic environment as do other students, with minimal disruption and time away from class. The plan is reviewed and amended at the beginning of each school year or, if required, more often.

The initial section of the plan provides identification information, such as name of student, name of school, current academic year, date of birth, grade level, dis-
ability, teacher, school bus number, and other appropriate data. In the second section, background information is presented on the chronic illness and how the student manages it. For the diabetes student, it could describe type 1 or type 2 diabetes and explain daily insulin injections or wearing an insulin pump. In addition, this section includes information regarding the control of blood sugar levels by balancing food, insulin, and activity levels. Ways to recognize high and low blood sugar levels also are presented.

The next section lists the objectives and goals of the 504 plan. This usually includes a statement that both high and low blood sugar levels affect learning and health and that the student’s blood glucose level must be maintained within an established range. If episodes of low or high blood sugar levels occur, they must be recognized and treated according to the 504 plan and the student’s healthcare plan. The student’s healthcare plan is approved by the student’s doctor, identifies the healthcare and service needs of the student with diabetes, and is incorporated into the 504 plan.

To administer the 504 plan, designated school faculty and staff must be trained according to American Diabetes Association guidelines. There are three categories of school staff members that receive training to care for students with diabetes, and each requires specific training (Kaufman 2001).

_ Authorized Diabetes Care Provider (ADCP). This school staff member has received training in the care of individuals with diabetes from a certified diabetes nurse_
educator, a pediatric endocrinologist, or other diabetes medical specialist, consistent with the ADA National Standards for Diabetes Self-Management Education. This person should have instruction in:

- The unassisted administration of glucagon and insulin injections and in recording results.
- Understanding physician instructions concerning drug dosage, frequency, and manner of administration.
- Applicable state regulations concerning drug storage, security, and record-keeping.
- Symptoms of hypoglycemia and hyperglycemia and the time within which glucagon or insulin injections are to be administered to prevent adverse consequences.
- Recommended schedules and menus for meals and snacks, recommended frequency of and activities in exercise periods, and actions to take if normal schedule is disrupted.
- Performing finger-stick blood glucose testing, urine or blood ketone testing, and recording the results.
- The appropriate steps to take when glucose level results are outside of the target ranges indicated in the student’s healthcare plan.

*Diabetes Care Assistant Provider (DCAP)*. This staff member should receive training that is consistent with ADA guidelines and have instruction in:

- The symptoms of hypoglycemia and hyperglycemia.
• The proper method for referring a student who exhibits symptoms of hypoglycemia or hyperglycemia to an ADCP.
• Recommended schedules and menus for meals and snacks.
• Recommended frequency of and the activities in exercise periods, and actions to take if normal schedule is disrupted.

*Bus Driver Diabetes Care Provider (BDDCP).* A bus driver should receive training that is consistent with ADA guidelines and that provides instruction in:

• The symptoms of hypoglycemia and hyperglycemia.
• The appropriate steps to take when glucose levels are creating emergency conditions.

The next part of the 504 plan is the healthcare supervision section, which states the minimum number of adult staff who will receive training in each of the diabetes care categories and lists the names of those trained. Supervision by at least one authorized diabetes care provider must be available at all times during school hours, extracurricular activities, and field trips. Any staff member who has primary care of a student with diabetes during these times and who is not an authorized diabetes care provider must receive training as a diabetes care assistant provider. Bus drivers who transport a student with diabetes must be trained as a bus driver diabetes care provider unless an ADCP or a DCAP is present.
A goal of the student’s healthcare team is for the student to increase his or her diabetes self-management skills and perform the required functions. To advise the school’s staff on what the student is able to accomplish independently, the next section of the 504 plan has a list of diabetes care proficiencies and states whether the student requires help to accomplish the activity. For example, the student might have total independent management skills and will require adult assistance only during severe low blood sugar. Another student with diabetes may be able to self-inject insulin but requires adult help with dosage verification. The list of skills in most 504 plans usually includes whether the student needs help with testing glucose levels or ketones, administering insulin, and monitoring meals.

Following the list of self-management skills, the 504 plan addresses specific needs of students with diabetes and how these needs should be met. For example, a required accommodation for students with diabetes is to have immediate access to water and the restroom. Another example is scheduling required snacks and meals. Students with diabetes should be able to eat a snack in the classroom, auditorium, gym, bus, and on any school function or activity. In addition, the student should have a source of glucose available at all times to treat low blood sugar or to respond to schedule changes. The healthcare plan specifies the times for snacks, the contents of a snack, where snacks are stored, when additional snacks are required, and the ADCP or DCAP responsible for supervision.

The plan also specifies when to perform blood glucose testing, insulin injections, or insulin pump adjust-
ments. If the student is not able to test blood glucose level or administer insulin independently, an ADCP or DCAP will perform the activity.

Regardless of how conscientiously the healthcare team works to prevent high or low blood sugar, problems can happen. The next part of the 504 plan addresses the treatment of high or low blood sugar and emergencies. If a school staff member notices the student showing symptoms of high or low blood sugar, the educator should notify the designated ADCP. An adult should always stay with a student who has actual or suspected high or low blood sugar. After the ADCP arrives, he or she can then treat the blood sugar levels according to the student’s healthcare plan or can initiate emergency procedures. In an emergency situation, such as an educator finding the student unconscious, the school office is to be notified and the following steps initiated:

1. Contact the ADCP, who will confirm the blood glucose level with a monitor and immediately administer glucagon.
2. Phone 911 or other local emergency response number.
3. Contact the student’s parent or guardian and physician at the emergency numbers provided in the healthcare plan.

The 504 plan also addresses how diabetes can influence the student’s general daily activities such as classroom work, tests, field trips, and other extracurricular activities. For example, the student will not be penalized for absences due to medical appointments or illness. If the student is in class and has to take a break to perform
a diabetes-related task, the student will be given extra time to finish any classwork without penalty and be given instruction to help complete the work. The same is true if a test is being administered. The student will be given extra time to complete the test. Also, a student who is not able to take a test because of high or low blood glucose levels will be allowed to take the test at another time without penalty. If the regular teacher is absent, any substitute teacher must be provided with written instructions for diabetes care and given a list of the authorized diabetes care providers and diabetes care assistant providers at the school.

A student with diabetes is not to be prohibited from any field trip or extracurricular activity, and the student’s parent or guardian is not required to chaperon. These activities are to be available without restriction; and any required modifications, including supervision, are to be performed by trained school personnel. An ADCP will accompany the student on all off-campus school activities to provide the expected diabetes care and ascertain that the student’s diabetes supplies are available. If there is a change in plans for field trips, extracurricular activities, or other activities, the ADCP or DCAP will notify the parent or guardian of the change far enough in advance so that any special instructions can be sent to the school.

Finally, students with diabetes should be encouraged to perform diabetes management to maintain blood glucose levels in the normal range. The ADCP or DCAP and all school staff members must respect the student’s privacy and keep information about the student’s dia-
Diabetes confidential. It is the student who decides the amount of information to make known regarding his or her diabetes.

There are times that the parents or guardians must be notified. Usually the 504 plan lists specific events that activate emergency procedures and that require specific individuals to be notified. These include:

- Symptoms of severe low blood sugar, such as a sudden change in behavior, confusion, unconsciousness, or convulsion.
- A blood glucose test result below a certain level.
- Symptoms of high blood sugar, such as frequent urination or presence of ketones.
- Blood glucose test result above a certain level.
- Student refuses to eat or take insulin.
- Any injury.

In these situations, the school staff is to call the school nurse, the parent or guardian at all available numbers, other emergency contacts, and the student's doctor.

**Sample Healthcare Plan**

The healthcare plan is a strategy developed under Section 504, ADA, and IDEA. The plan identifies the healthcare needs of, and services to be provided to, a student with diabetes and is approved by the student's treating physician. It is an integral part of the 504 plan. The healthcare plan is specific to the individual student and is to be part of the student's record and readily available to the ADCP and others designated to care for the student.
The following outline of a school healthcare plan was developed by the American Diabetes Association and the Disability Rights Education and Defense Fund. The plan is to be completed and signed by the student’s parent or guardian and members of the student’s healthcare team, including a school representative.

The initial section of the healthcare plan details the student’s name, date of birth, grade, school, homeroom teacher, and the effective dates of the plan. This is followed by contact information. Included are the parent or guardian’s name, address, phone numbers, the student’s doctor, the doctor’s address and phone numbers, and other emergency information. E-mail addresses also are helpful. Also in this section are listed the situations that require parental notification and emergency action.

The next major section addresses blood glucose monitoring. Included is information regarding the usual times to test blood glucose and the target blood glucose range for the student. Also listed are reasons that additional blood glucose testing may be required, such as before and after exercising or when the student exhibits symptoms of blood glucose levels outside the normal range. This section affirms whether the student can perform his or her own blood test, the type of glucose meter the student uses, when the student may need assistance with the blood glucose test, and the school staff member trained to monitor blood glucose level, including dates of training.

All students with type 1 diabetes and some students with type 2 diabetes must take insulin through injections
or by wearing an insulin pump. The section on insulin lists the times, types, and dosages of insulin injections to be given during school. The school personnel trained to assist with administering insulin and the dates of training also are recorded. As with glucose monitoring, there is a list of statements that indicate if the student is able to administer insulin independently. Variables include whether the student is able to self-inject, determine the correct amount of insulin, and draw the correct dosage. For students with insulin pumps, there is a section that indicates the type of pump, basal rates, insulin/carbohydrate ratio, and a correction equation or scale. Also recorded is whether the student is competent in using the pump and is able to troubleshoot problems.

Because students with diabetes must carefully balance food, activity levels, and insulin intake, the next two sections address food consumption and exercise. Listed are the regular meals and snacks for the student, the time, the food content, and the amount. Also listed is when other snacks should be given, their food content, and what source of glucose should always be available. This includes any restrictions regarding exercise and sports. This section includes instructions regarding favorite foods, foods to avoid, and what foods the student can eat at special events, such as a class party.

The next item addressed is how to recognize and treat low and high blood sugar. The healthcare plan lists the usual symptoms for hypoglycemia, its treatment, and the person trained to administer glucagon. The healthcare plan also lists the symptoms of high blood sugar and its treatment. In certain instances with high blood
sugar, the urine or blood should be tested for ketones. The healthcare plan lists the circumstances when ketones should be tested, the treatment for ketones, and the school personnel trained to perform the test.

The final section of the plan addresses the location of diabetes supplies. The supplies for testing blood glucose levels, administering insulin, and testing for ketones should be easily available to the student and trained staff members. Also readily available should be glucagon, insulin, and supplies of snack food. This section also records the school personnel who are trained in diabetes management and the dates of training. The signatures of the student’s healthcare provider, the student’s parent or guardian, and the school representative complete the plan.
Conclusion

Most teachers want their students to experience a high-quality education and to succeed. To meet the needs of students with diabetes, the teacher must be prepared for the special challenges these students present. The teacher who understands diabetes will be better able to handle diabetes-related situations calmly and effectively and may help prevent further medical problems.

Although a student with diabetes has the same education needs as do other students, academic performance can be affected by medication, absenteeism, the physical effects of illness, and prescribed therapy. By providing appropriate interventions, the classroom teacher can develop an environment in which the student can perform at full potential and participate in school activities. In many cases, students with diabetes experience physical and emotional stress that may adversely affect self-esteem and feelings of self-worth. Teachers and the rest of the healthcare team can evaluate the student's needs and develop a classroom environment in which the student with diabetes feels accepted and valued.
What educators do in the classroom has long-term consequences, either positive or negative. Therefore it is worth the effort to provide the best possible classroom environment for all students.
Resources

American Diabetes Association (ADA). "Type 2 Diabetes in Children and Adolescents (Consensus Statement)." *Diabetes Care* 23 (2000): 381-89. a


**Web Resources**

American Association of Diabetes Educators  
www.aadenet.org

American Diabetes Association  
www.diabetes.org

Centers for Disease Control and Prevention  
www.cdc.gov/diabetes

National Center for Health Statistics  
www.cdc.gov/nchs

Centers for Medicare and Medicaid Services  
cms.hhs.gov/

Department of Veterans Affairs, Veterans Health Administration Diabetes Program  
www.va.gov/health/diabetes/
Diabetes123
www.diabetes123.com

Health Resources and Services Administration
www.hrsa.gov

Indian Health Service
www.ihs.gov

Juvenile Diabetes Research Foundation International
www.jdrf.org

National Council of La Raza
www.nclr.org

National Diabetes Education Program, a joint program of NIH and CDC
www.ndep.nih.gov
www.cdc.gov/diabetes/projects/ndeps.htm
www.cdc.gov/team-ndep

National Institute of Diabetes and Digestive and Kidney Disease of the National Institutes of Health
www.niddk.nih.gov

U.S. Department of Health and Human Services, Office of Minority Health
www.omhrc.gov
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ISBN 0-87367-899-0

9780873678995