

Diabetes Care in the School and Day Care Setting

AMERICAN DIABETES ASSOCIATION

Diabetes is one of the most common chronic diseases of childhood. There are about 176,000 individuals <20 years of age with diabetes in the U.S. (1). About one in every 400–600 children and adolescents has type 1 diabetes (2). The majority of these young people attend school and/or some type of day care and need knowledgeable staff to provide a safe school environment. Both parents and the health care team should work together to provide school systems and day care providers with the information necessary to allow children with diabetes to participate fully and safely in the school experience (3,4).

DIABETES AND THE LAW

— Federal laws that protect children with diabetes include Section 504 of the Rehabilitation Act of 1973 (5), the Individuals with Disabilities Education Act of 1991 (originally the Education for All Handicapped Children Act of 1975) (6), and the Americans with Disabilities Act (7). Under these laws, diabetes has been considered to be a disability, and it is illegal for schools and/or day care centers to discriminate against children with disabilities. In addition, any school that receives federal funding or any facility considered open to the public must reasonably accommodate the special needs of children with diabetes. Indeed, federal law requires an individualized assessment of any child with diabetes. The required accommodations should be provided within the child’s usual school setting with as little disruption to the school’s and the child’s routine as possible and allowing the child full participation in all school activities (8,9).

Despite these protections, children in the school and day care setting still face discrimination. For example, some day care centers may refuse admission to chil-

dren with diabetes, and children in the classroom may not be provided the assistance necessary to monitor blood glucose and administer insulin, and may be prohibited from eating needed snacks. The American Diabetes Association works to ensure the safe and fair treatment of children with diabetes in the school and day care setting (10–15) (www.diabetes.org/schooldiscrimination).

Diabetes care in schools

Appropriate diabetes care in the school and day care setting is necessary for the child’s immediate safety, long-term well being, and optimal academic performance. The Diabetes Control and Complications Trial showed a significant link between blood glucose control and the later development of diabetes complications, with improved glycemic control decreasing the risk of these complications (16,17). To achieve glycemic control, a child must monitor blood glucose frequently, follow a meal plan, and take medications. Insulin is usually taken in multiple daily injections or through an infusion pump. Crucial to achieving glycemic control is an understanding of the effects of physical activity, nutrition therapy, and insulin on blood glucose levels.

To facilitate the appropriate care of the student with diabetes, school and day care personnel must have an understanding of diabetes and must be trained in its management and in the treatment of diabetes emergencies (3,18,19,20,34). Knowledgeable trained personnel are essential if the student is to avoid the immediate health risks of low blood glucose and to achieve the metabolic control required to decrease risks for later development of diabetes complications (3,20). Studies have shown that the majority of school personnel have an inadequate understanding of diabetes (21,22). Conse-

quently, diabetes education must be targeted toward day care providers, teachers, and other school personnel who interact with the child, including school administrators, school coaches, school nurses, health aides, bus drivers, secretaries, etc. (3,20). Current recommendations and up-to-date resources regarding appropriate care for children with diabetes in the school are universally available to all school personnel (3,23).

The purpose of this position statement is to provide recommendations for the management of children with diabetes in the school and day care setting.

GENERAL GUIDELINES FOR THE CARE OF THE CHILD IN THE SCHOOL AND DAY CARE SETTING

I. Diabetes Medical Management Plan

An individualized Diabetes Medical Management Plan should be developed by the parent/ guardian and the student’s diabetes health care team. Inherent in this process are delineated responsibilities assumed by all parties, including the parent/guardian, the school personnel, and the student (3,24,25). These responsibilities are outlined in this position statement. The Diabetes Medical Management Plan should address the specific needs of the child and provide specific instructions for each of the following:

1. Blood glucose monitoring, including the frequency and circumstances requiring blood glucose checks.
2. Insulin administration (if necessary), including doses/injection times prescribed for specific blood glucose values, the storage of insulin, and, when appropriate, physician authorization of parent/guardian adjustments to insulin dosage.
3. Meals and snacks, including food content, amounts, and timing.

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4. Symptoms and treatment of hypoglycemia (low blood glucose), including the administration of glucagon if recommended by the student's treating physician.
5. Symptoms and treatment of hyperglycemia (high blood glucose).
6. Checking for ketones and appropriate actions to take for abnormal ketone levels, if requested by the student's health care provider.

Figure 1 includes a sample Diabetes Medical Management Plan. For detailed information on the symptoms and treatment of hypoglycemia and hyperglycemia, refer to the *Medical Management of Type 1 Diabetes* (26). A brief description of diabetes targeted to school and day care personnel is included in the APPENDIX; it may be helpful to include this information as an introduction to the Diabetes Medical Management Plan.

II. Responsibilities of the various care providers (3)

- A. The parent/guardian should provide the school or day care provider with the following:
 1. All materials and equipment necessary for diabetes care tasks, including blood glucose monitoring, insulin administration (if needed), and urine or blood ketone monitoring. The parent/guardian is responsible for the maintenance of the blood glucose monitoring equipment (i.e., cleaning and performing controlled testing per the manufacturer's instructions) and must provide materials necessary to ensure proper disposal of materials. A separate logbook should be kept at school with the diabetes supplies for the staff or student to record blood glucose and ketone results; blood glucose values should be transmitted to the parent/guardian for review as often as requested.
 2. Supplies to treat hypoglycemia, including a source of glucose and a glucagon emergency kit, if indicated in the Diabetes Medical Management Plan.
 3. Information about diabetes and the performance of diabetes-related tasks.
 4. Emergency phone numbers for the parent/guardian and the diabetes health care team so that the school can contact these individuals with diabetes-related questions and/or during emergencies.
5. Information about the student's meal/snack schedule. The parent should work with the school to coordinate this schedule with that of the other students as closely as possible. For young children, instructions should be given for when food is provided during school parties and other activities.
6. In most locations and increasingly, a signed release of confidentiality from the legal guardian will be required so that the health care team can communicate with the school. Copies should be retained both at school and in the health care professionals' offices.
- B. The school or day care provider should provide the following:
 1. Training to all adults who provide education/care for the student on the symptoms and treatment of hypoglycemia and hyperglycemia and other emergency procedures. An adult and back-up adult(s) trained to 1) perform fingerstick blood glucose monitoring and record the results; 2) take appropriate actions for blood glucose levels outside of the target ranges as indicated in the student's Diabetes Medical Management Plan; and 3) test the urine or blood for ketones, when necessary, and respond to the results.
 2. Immediate accessibility to the treatment of hypoglycemia by a knowledgeable adult. The student should remain supervised until appropriate treatment has been administered, and the treatment should be available as close to where the student is as possible.
 3. If indicated by the child's developmental capabilities and the Diabetes Medical Management Plan, an adult and back-up adult(s) trained in insulin administration.
 4. An adult and back-up adult(s) trained to administer glucagon, in accordance with the student's Diabetes Medical Management Plan.
 5. A location in the school to provide privacy during blood glucose monitoring and insulin administration, if desired by the student and family, or permission for the student to check his or her blood glucose level and to take appropriate action to treat hypoglycemia in the classroom or anywhere the student is in conjunction with a school activity, if indicated in the student's Diabetes Medical Management Plan.
6. An adult and back-up adult(s) responsible for the student who will know the schedule of the student's meals and snacks and work with the parent/guardian to coordinate this schedule with that of the other students as closely as possible. This individual also will notify the parent/guardian in advance of any expected changes in the school schedule that affect the student's meal times or exercise routine. Young children should be reminded of snack times.
7. Permission for the student to see the school nurse and other trained school personnel upon request.
8. Permission for the student to eat a snack anywhere, including the classroom or the school bus, if necessary to prevent or treat hypoglycemia.
9. Permission to miss school without consequences for required medical appointments to monitor the student's diabetes management. This should be an excused absence with a doctor's note, if required by usual school policy.
10. Permission for the student to use the restroom and have access to fluids (i.e., water) as necessary.
11. An appropriate location for insulin and/or glucagon storage, if necessary.
12. Information on serving size and caloric, carbohydrate, and fat content of foods served in the school (27).

An adequate number of school personnel should be trained in the necessary diabetes procedures (e.g., blood glucose monitoring, insulin and glucagon administration) and in the appropriate response to high and low blood glucose levels to ensure that at least one adult is present to perform these procedures in a timely manner while the student is at school, on field trips, and during extracurricular activities or other school-sponsored events (3,18,20). These school personnel need not be health care professionals (3,9,20,28,33,35).

The student with diabetes should have immediate access to diabetes supplies at all times, with supervision as needed. Provisions similar to those described above must be available for field trips, extracurricular activities, other school-sponsored events, and on transportation provided by the school or day

Date of Plan _____ **Diabetes Medical Management Plan** Effective Dates _____

This plan should be completed by the student's personal health care team and parents/guardian. It should be reviewed with relevant school staff and copies should be kept in a place that is easily accessed by the school nurse, trained diabetes personnel, and other authorized personnel.

Student's Name _____ DOB _____ Date of Diabetes Diagnosis _____

Grade _____ Homeroom Teacher _____ Physical Condition: Diabetes Type 1 Diabetes Type 2

Contact Information

Parent/Guardian #1 _____ Address _____

Phone: Work _____ Home _____ Cell _____

Parent/Guardian #2 _____ Address _____

Work _____ Home _____ Cell _____

Student's Doctor/Health Care Provider:

Name _____ Address _____

Phone: _____ Emergency Number: _____

Other Emergency Contacts:

Name _____ Relationship _____

Phone: Work _____ Home _____ Cell _____

Notify parents/guardian or emergency contact in the following situations: _____

Blood Glucose Monitoring

Target range for blood glucose is 70-150 70-180 Other

Usual times to check blood glucose: _____

Times to do extra blood glucose checks (circle all that apply)

Before exercise	After exercise
Student exhibits symptoms of hyperglycemia	Student exhibits symptoms of hypoglycemia
Other (explain) _____	

Can student perform own blood glucose? Yes No

Exceptions: _____

Type of blood glucose meter student uses: _____

Insulin

Usual lunchtime dose: _____

Base does of Humalog/Novolog/Regular Insulin at lunch (circle type of rapid-/short-acting insulin used) is _____ units or does flexible dosing using _____ units/ _____ grams carbohydrate.

Use of other insulin at lunch (circle type of insulin used): intermediate/NPH/lente _____ units or basal/Lantus/Ultralente _____ units.

Insulin Correction Doses

Parental authorization should be obtained before administering a correction dose for high blood glucose levels: Yes No

_____ units if blood glucose is _____ to _____ mg/dl	_____ units if blood glucose is _____ to _____ mg/dl
_____ units if blood glucose is _____ to _____ mg/dl	_____ units if blood glucose is _____ to _____ mg/dl
_____ units if blood glucose is _____ to _____ mg/dl	

Figure 1—Diabetes Medical Management Plan.

Can student give own injections? Yes No
 Can student determine correct amount of insulin? Yes No
 Can student draw correct dose of insulin? Yes No

_____ Parents are authorized to adjust the insulin dosage under the following circumstances _____

For Students With Insulin Pumps:

Type of pump: _____ Basal rates: _____ 12 a.m. to _____
 _____ to _____ _____ to _____

Type of insulin in pump: _____

Type of infusion set: _____

Insulin/carbohydrate ratio: _____ Correction factor: _____

Student pump abilities/skills _____ Needs assistance: _____

Count carbohydrates:	Yes	No
Bolus correct amount for carbohydrates consumed	Yes	No
Calculate and administer corrective bolus	Yes	No
Calculate and set basal profiles	Yes	No
Calculate and set temporary basal rate	Yes	No
Disconnect pump	Yes	No
Reconnect pump at infusion set	Yes	No
Prepare reservoir and tubing	Yes	No
Insert infusion set	Yes	No
Troubleshoot alarms and malfunctions	Yes	No

For Students Taking Oral Diabetes Medication:

Type of medication: _____ Timing: _____

Other medications: _____ Timing: _____

Meals and Snacks Eaten at School

Is student independent in carbohydrate calculations and management? Yes No

Meal/snack _____ Time: _____ Food content/amount _____

Breakfast _____

Mid-A.M. snack _____

Lunch _____

Mid-P.M. snack _____

Dinner _____

Snack before exercise? Yes No

Snack after exercise? Yes No

Other times to give snacks and content/amount: _____

Preferred snack foods: _____

Foods to avoid, if any: _____

FIG. 1—Continued

Instructions for when food is provided to the class (e.g., as part of a class party or food sampling event): _____

Exercise and Sports

A fast-acting carbohydrate such as _____ should be available at the site of exercise or sports.

Restrictions on activity if any _____

Student should not exercise if blood glucose level is below _____ mg/dl or above _____ mg/dl or if a moderate to large urine ketones are present.

Hypoglycemia (Low Blood Sugar)

Usual symptoms of hypoglycemia: _____

Treatment of hypoglycemia: _____

Glucagon should be given if the student is unconscious, having a seizure (convulsion), or unable to swallow.

Route _____, Dosage _____, site for glucagon injection: _____ arm, _____ thigh, _____ other.

If Glucagon is required, administer it promptly, then call 911 or other emergency assistance and the parents/guardian.

Hyperglycemia (High Blood Sugar)

Usual symptoms of hyperglycemia: _____

Treatment of hyperglycemia: _____

Urine should be checked for ketones when blood glucose level are above _____ mg/dl.

Treatment for Ketones: _____

Supplies to Be Kept at School:

- _____ Blood glucose meter, blood glucose test strips, batteries for meter
- _____ Lancet device, lancets, gloves, etc.
- _____ Urine ketone strips
- _____ Insulin vials and syringes
- _____ Insulin pump and supplies
- _____ Insulin pen, pen needles, insulin cartridges
- _____ Fast-acting source of glucose
- _____ Carbohydrate containing snack
- _____ Glucagon emergency kit

Signatures

This Diabetes Medical Management Plan has been approved by:

Student's Physician / Health Care Provider	Date
Acknowledged and received by:	
Student's Parent / Guardian	Date
Student's Parent / Guardian	Date
Student's Parent / Guardian	Date

FIG. 1—Continued

Table 1—Resources for teachers, child care providers, parents, and health professionals

Helping the Student with Diabetes Succeed: A Guide for School Personnel, National Diabetes Education Program, 2003; available online at http://www.ndep.nih.gov/diabetes/pubs/Youth_SchoolGuide.

Diabetes Care Tasks at School: What Key Personnel Need to Know, Alexandria, VA, American Diabetes Association, 2005; available online at www.diabetes.org/schooltraining.

Health in Action: Diabetes and the School Community, American School Health Association, American Diabetes Association, Aug./Sept. 2002, Vol. 1, No. 1, 330-678-1601.

Your School & Your Rights: Protecting Children with Diabetes Against Discrimination in Schools and Day Care Centers, Alexandria, VA, American Diabetes Association, 2005 (brochure); available online at <http://www.diabetes.org/advocacy-and-legalresources/discrimination/schools/scripts.jsp>.*

Children with Diabetes: Information for School and Child Care Providers, Alexandria, VA, American Diabetes Association, 2004 (brochure); available online at <http://www.diabetes.org/uedocuments/c-ren-wdiabetes-brochure-caregivers.pdf>.*

Treating Diabetes Emergencies: What You Need to Know, Alexandria, VA, American Diabetes Association, 1995 (video); 1-800-232-6733.

American Diabetes Association: *Complete Guide to Diabetes*, Alexandria, VA, American Diabetes Association, 2005; 1-800-232-6733.

Raising a Child with Diabetes: A Guide for Parents, Alexandria, VA, American Diabetes Association, 2000; 1-800-232-6733.

Clarke W: Advocating for the child with diabetes. *Diabetes Spectrum* 12:230–236, 1999.

Education Discrimination Resources List, Alexandria VA, American Diabetes Association, 2006; available online at <http://www.diabetes.org/advocacy-and-legalresources/discrimination/school/resources.jsp>.*

Wisdom: A Kit of Wit and Wisdom for Kids with Diabetes (and their parents), Alexandria, VA, American Diabetes Association, 2000. Order information and select resources available at www.diabetes.org/wisdom.

Animas Corporation, *What to Teach the Teacher*, 2006; 1-877-937-7867; available online at http://animascorp.com/futuretechnologies/learningcenter/ar_teach.shtml.

Fredrickson L, Griff M: *Pumper in the School, Insulin Pump Guide for School Nurses, School Personnel and Parents. MiniMed Professional Education, Your Clinical Coach. First Edition, May 2000*. Medtronic, MiniMed, Inc., 1-800-440-7867.

Tappon D, Parker M, Bailey W: *Easy As ABC, What You Need to Know About Children Using Insulin Pumps in School*. Disetronic Medical Systems, Inc., 1-800-280-7801.

American Diabetes Association: <http://www.diabetes.org/schooldiscrimination>; <http://www.diabetes.org/safeatschool>.

Children with Diabetes: http://www.childrenwithdiabetes.com/d_0q_000.htm.

*These documents are available in the American Diabetes Association's Education Discrimination Packet by calling 1-800-DIABETES.

care facility to enable full participation in school activities.

It is the school's legal responsibility to provide appropriate training to school staff on diabetes-related tasks and in the treatment of diabetes emergencies. This training should be provided by health care professionals with expertise in diabetes unless the student's health care provider determines that the parent/guardian is able to provide the school personnel with sufficient oral and written information to allow the school to have a safe and appropriate environment for the child. If appropriate, members of the health care team should provide instruction and materials to the parent/guardian to facilitate the education of school staff. Educational materials from the American Diabetes Association and other sources targeted to

school personnel and/or parents are available. Table 1 includes a listing of appropriate resources.

III. Expectations of the student in diabetes care

Children and youths should be able to implement their diabetes care at school with parental consent to the extent that is appropriate for the student's development and his or her experience with diabetes. The extent of the student's ability to participate in diabetes care should be agreed upon by the school personnel, the parent/guardian, and the health care team, as necessary. The ages at which children are able to perform self-care tasks are very individual and variable, and a child's capabilities and willingness to provide self-care should be respected (18).

1. *Preschool and day care.* The preschool child is usually unable to perform diabetes tasks independently. By 4 years of age, children may be expected to generally cooperate in diabetes tasks.
2. *Elementary school.* The child should be expected to cooperate in all diabetes tasks at school. By age 8 years, most children are able to perform their own fingerstick blood glucose tests with supervision. By age 10, some children can administer insulin with supervision.
3. *Middle school or junior high school.* The student should be able to administer insulin with supervision and perform self-monitoring of blood glucose under usual circumstances when not experiencing a low blood glucose level.
4. *High school.* The student should be able to perform self-monitoring of blood glucose under usual circumstances when not experiencing low blood glucose levels. In high school, adolescents should be able to administer insulin without supervision.

At all ages, individuals with diabetes may require help to perform a blood glucose check when the blood glucose is low. In addition, many individuals require a reminder to eat or drink during hypoglycemia and should not be left unsupervised until such treatment has taken place and the blood glucose value has returned to the normal range.

MONITORING BLOOD GLUCOSE IN THE CLASSROOM

It is best for a student with diabetes to monitor a blood glucose level and to respond to the results as quickly and conveniently as possible. This is important to avoid medical problems being worsened by a delay in monitoring and treatment and to minimize educational problems caused by missing instruction in the classroom. Accordingly, as stated earlier, a student should be permitted to monitor his or her blood glucose level and take appropriate action to treat hypoglycemia in the classroom or anywhere the student is in conjunction with a school activity, if preferred by the student and indicated in the student's Diabetes Medical Management Plan (3,24). However, some students desire privacy for blood glucose monitoring and other diabetes care tasks and this preference should also be accommodated.

In summary, with proper planning and the education and training of school personnel, children and youth with diabetes

can fully participate in the school experience. To this end, the family, the health care team, and the school should work together to ensure a safe learning environment.

APPENDIX: BACKGROUND INFORMATION ON DIABETES FOR SCHOOL PERSONNEL (3)

Diabetes is a serious, chronic disease that impairs the body's ability to use food. Insulin, a hormone produced by the pancreas, helps the body convert food into energy. In people with diabetes, either the pancreas does not make insulin or the body cannot use insulin properly. Without insulin, the body's main energy source—glucose—cannot be used as fuel. Rather, glucose builds up in the blood. Over many years, high blood glucose levels can cause damage to the eyes, kidneys, nerves, heart, and blood vessels.

The majority of school-aged youth with diabetes have type 1 diabetes. People with type 1 diabetes do not produce insulin and must receive insulin through either injections or an insulin pump. Insulin taken in this manner does not cure diabetes and may cause the student's blood glucose level to become dangerously low. Type 2 diabetes, the most common form of the disease typically afflicting obese adults, has been shown to be increasing in youth. This may be due to the increase in obesity and decrease in physical activity in young people. Students with type 2 diabetes may be able to control their disease through diet and exercise alone or may require oral medications and/or insulin injections. All people with type 1 and type 2 diabetes must carefully balance food, medications, and activity level to keep blood glucose levels as close to normal as possible.

Low blood glucose (hypoglycemia) is the most common immediate health problem for students with diabetes. It occurs when the body gets too much insulin, too little food, a delayed meal, or more than the usual amount of exercise. Symptoms of mild to moderate hypoglycemia include tremors, sweating, lightheadedness, irritability, confusion, and drowsiness. A student with this degree of hypoglycemia will need to ingest carbohydrates promptly and may require assistance. Severe hypoglycemia, which is rare, may lead to unconsciousness and convulsions and can be life-threatening if not treated promptly (18,24,29,30,31).

High blood glucose (hyperglycemia) occurs when the body gets too little insulin,

too much food, or too little exercise; it may also be caused by stress or an illness such as a cold. The most common symptoms of hyperglycemia are thirst, frequent urination, and blurry vision. If untreated over a period of days, hyperglycemia can cause a serious condition called diabetic ketoacidosis (DKA), which is characterized by nausea, vomiting, and a high level of ketones in the blood and urine. For students using insulin infusion pumps, lack of insulin supply may lead to DKA more rapidly. DKA can be life-threatening and thus requires immediate medical attention (32).

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