

Care of Children With Diabetes in the School and Day Care Setting

AMERICAN DIABETES ASSOCIATION

Diabetes is one of the most common chronic diseases of childhood, with a prevalence of ~1.7 affected individuals per 1,000 people aged <20 years (1–4). In the U.S., ~13,000 new cases are diagnosed annually in children (4–7). There are about 125,000 individuals <19 years of age with diabetes in the U.S. (8). 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 (9–12). 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.

DIABETES AND THE LAW

— Federal laws that protect children with diabetes include Section 504 of the Rehabilitation Act of 1973, the Individuals with Disabilities Education Act of 1991 (originally the Education for All Handicapped Children Act of 1975), and the Americans with Disabilities Act. 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.

Despite these protections, children in the school and day care setting still face discrimination. For example, some day care centers may refuse admission to children with diabetes, and children in the classroom may not be provided the assistance necessary to monitor blood glucose 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 (13–15).

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 understand-

ing of diabetes and must be trained in its management and in the treatment of diabetes emergencies. 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. Studies have shown that the majority of school personnel have an inadequate understanding of diabetes and that parents of children with diabetes lack confidence in their teachers’ ability to manage diabetes effectively (12,18,19). Consequently, 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.

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 Health Care Plan

An individualized Diabetes Health Care Plan should be developed by the parent/guardian, the student’s diabetes care team, and the school or day care provider. Inherent in this process are delineated responsibilities assumed by all parties, including the parent/guardian, the school personnel, and the student. These responsibilities are outlined in this position statement. The Diabetes Health Care 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 testing.

The recommendations in this paper are based on the evidence reviewed in the following publications: Diabetes Control and Complications Trial Research Group: The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* 329:977–986, 1993; and Diabetes Control and Complications Trial Research Group: The effect of intensive diabetes treatment on the development and progression of long-term complications in adolescents with insulin-dependent diabetes mellitus. *J Pediatr* 125:177–188, 1994.

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2. Insulin administration (if necessary), including doses/injection times prescribed for specific blood glucose values and the storage of insulin.
3. Meals and snacks, including food content, amounts, and timing.
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. Testing 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 Health Care Plan. For detailed information on the symptoms and treatment of hypoglycemia and hyperglycemia, refer to the *Medical Management of Type 1 Diabetes* (20). 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 Health Care Plan.

II. Responsibilities of the various care providers

- 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 testing, insulin administration (if needed), and urine or blood ketone testing. The parent/guardian is responsible for the maintenance of the blood glucose testing 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 test 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 Health Care Plan.

3. Information about diabetes and the performance of diabetes-related tasks.
4. Emergency phone numbers for the parent/guardian and the diabetes 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.

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 Health Care Plan; and 3) test the urine or blood for ketones, when necessary, and respond to the results of this test.
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 Health Care 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 Health Care Plan.
5. A location in the school to provide privacy during testing 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 any-where the student

is in conjunction with a school activity, if indicated in the student's Diabetes Health Care 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 school medical 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.

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. These school personnel need not be health care professionals.

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 care facility to enable full participation in school activities.

It is the school's legal responsibility to

Position Statement

Diabetes Care Plan for _____ (name of student) School _____ Effective Dates: _____

To be completed by parents/health care team and reviewed with necessary school staff. Copies should be kept in student's classrooms and school records.

Date of Birth: _____ Grade: _____ Homeroom Teacher: _____

Contact Information:

Parent/guardian #1: Address: _____
 Telephone - Home: _____ Work: _____ Cell Phone: _____
 Parent/guardian #2: Address: _____
 Telephone - Home: _____ Work: _____ Cell Phone: _____
 Student's Doctor/Health Care Provider: _____ Telephone: _____
 Nurse Educator: _____ Telephone: _____
 Other emergency contact: Relationship: _____
 Telephone - Home: _____ Work: _____ Cell Phone: _____

Notify parent/guardian in the following situations: _____

Blood Glucose Monitoring

Target range for blood glucose: _____ mg/dl to _____ mg/dl Type of blood glucose meter student uses: _____

Usual times to test blood glucose: _____

Times to do extra tests (check all that apply):
 _____ Before exercise _____ When student exhibits symptoms of hyperglycemia
 _____ After exercise _____ When student exhibits symptoms of hypoglycemia
 _____ Other (explain): _____

Can student perform own blood glucose tests? Yes No Exceptions: _____

School personnel trained to monitor blood glucose level and dates of training: _____

Insulin

Times, types, and dosages of insulin injections to be given during school:

Time	Type(s)	Dosage
_____	_____	_____
_____	_____	_____

School personnel trained to assist with insulin injection and dates of training: _____

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

For Students with Insulin Pumps:

Type of pump: _____

Insulin/carbohydrate ratio: _____

Correction factor: _____

Is student competent regarding pump? Yes No

Can student effectively troubleshoot problems (e.g., ketosis, pump malfunction)? Yes No

Comments: _____

Meals and Snacks Eaten at School (The carbohydrate content of the food is important in maintaining a stable blood glucose level.)

Time	Food content/amount
Breakfast _____	_____
A.M. snack _____	_____
Lunch _____	_____
P.M. snack _____	_____
Dinner _____	_____
Snack before exercise? Yes No _____	_____
Snack after exercise? Yes No _____	_____

Other times to give snacks and content/amount: _____

A source of glucose, such as _____, should be readily available at all times.

Preferred snack foods: _____

Foods to avoid, if any: _____

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

Hypoglycemia (Low Blood Sugar)

Usual symptoms of hypoglycemia: _____

Treatment of hypoglycemia: _____

School personnel trained to administer glucagon and dates of training: _____

Glucagon should be given if the student is unconscious, having a seizure (convulsion), or unable to swallow. If required, glucagon should be administered promptly and then 911 (or other emergency assistance) and parents should be called.

Exercise and Sports

A snack such as _____ should be readily available at the site of exercise or sports.

Restrictions on activity, if any: _____

Student should not exercise if blood glucose is below _____ mg/dl.

Supplies and Personnel

Location of supplies: Blood glucose monitoring equipment: _____ Insulin administration supplies: _____

Glucagon emergency kit: _____ Ketone testing supplies: _____

Snack foods: _____

Personnel trained in the symptoms and treatment of low and high blood sugar and dates of training: _____

Signatures

Reviewed by: [student's health provider/ date] Acknowledged/received by: [guardian/date] Acknowledged/received by: [school representative/date]

Figure 1—Diabetes Health Care Plan.

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

- Children with Diabetes: Information for Teachers & Child-Care Providers*, Alexandria, VA, American Diabetes Association, 1999 (brochure); available online at www.diabetes.org/ada/teacher.asp.
- Your School & Your Rights: Protecting Children with Diabetes Against Discrimination in Schools and Day Care Centers*, Alexandria, VA, American Diabetes Association, 2000 (brochure); available online at www.diabetes.org/ada/scrights.asp.*
- Your Child Has Type 1 Diabetes: What You Should Know*, Alexandria, VA, American Diabetes Association, 1999 (brochure); available online at www.diabetes.org/advocacy/type1.asp.*
- Treating Diabetes Emergencies: What You Need to Know*, Alexandria, VA, American Diabetes Association, 1995 (video); 1-800-232-6733.
- Complete Guide to Diabetes*, Alexandria, VA, American Diabetes Association, 1999; 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, 2000.*
- Wizdom: 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/wizdom.
- The Care of Children with Diabetes in Child Care and School Setting* (video); available from, Managed Design, Inc., P.O. Box 3067, Lawrence, KS 66046, (785) 842-9088.
- 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*. 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.

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

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 develop-

ment 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.

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 test 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 obtain 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 testing/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 Health Care Plan. However, some students desire privacy during testing 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

— 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 schooled 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 (21). 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.

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 symp-

toms 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.

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