Diabetes Care in the School and Day Care Setting

Diabetes is one of the most common chronic diseases of childhood (1). There are \( \sim 215,000 \) individuals \(<20\) years of age with diabetes in the U.S. (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 (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 documented in a written plan developed under the applicable federal law such as a Section 504 Plan or Individualized Education Program (IEP). The needs of a student with diabetes should be provided for 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 children 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 later development of diabetes complications, with improved glycemic control decreasing the risk of these complications (16,17). To achieve glycemic control, a child must check blood glucose frequently, monitor food intake, take medications, and engage in regular physical activity. 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, the school nurse as well as other 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 (3,18,19,20,34,36). 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). Consequently,
diabetes education must be targeted toward day care providers, teachers, and other school personnel who interact with the child, including school administrators, school nurses, coaches, 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 (DMMP) should be developed by the student’s personal diabetes health care team with input from the parent/guardian. 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. In addition, the DMMP should be used as the basis for the development of written education plans such as the Section 504 Plan or the IEP. The DMMP 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, and use of continuous glucose monitoring if utilized.
2. Insulin administration (if necessary), including doses/injection times prescribed for specific blood glucose values and for carbohydrate intake, 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.
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.
7. Participation in physical activity.
8. Emergency evacuation/school lockdown instructions.

A sample DMMP (http://professional.diabetes.org/DMMP) may be accessed online and customized for each individual student. For detailed information on the symptoms and treatment of hypoglycemia and hyperglycemia, refer to 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 DMMP.

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, equipment, insulin, and other medication 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. Some students maintain a record of blood glucose results in meter memory rather than recording in a logbook, especially if the same meter is used at home and at school.
2. The DMMP completed and signed by the student’s personal diabetes health care team.
3. Supplies to treat hypoglycemia, including a source of glucose and a glucagon emergency kit, if indicated in the DMMP.
5. 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.
6. Information about the student’s meal/snack schedule. The parent should work with the school during the teacher preparation period before the beginning of the school year or before the student returns to school after diagnosis 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.
7. 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 the school and in the health care professionals’ offices.

B. The school or day care provider should provide the following:

1. Opportunities for the appropriate level of ongoing training and diabetes education for the school nurse.
2. Training for school personnel as follows: level 1 training for all school staff members, which includes a basic overview of diabetes, typical needs of a student with diabetes, recognition of hypoglycemia and hyperglycemia, and who to contact for help; level 2 training for school staff members who have responsibility for a student or students with diabetes, which includes all content from level 1 plus recognition and treatment of hypoglycemia and
7. School nurse and back-up trained
5. A location in the school that
4. Accessibility to scheduled insulin at
3. Immediate accessibility to the
2. A plan for the disposal of sharps
1. Toddlers and preschool-aged
children: unable to perform diabetes
tasks independently and will need an
adult to provide all aspects of
diabetes care. Many of these
younger children will have difficulty
in recognizing hypoglycemia, so it is
important that school personnel are
able to recognize and provide
prompt treatment. However,
children in this age range can usually
determine which finger to prick, can
choose an injection site, and are
generally cooperative.

2. Elementary school–aged children:
depending on the length of diagnosis
and level of maturity, may be able to
perform their own blood glucose
checks, but usually will require
supervision. Older elementary
school–aged children are generally
beginning to self-administer insulin
with supervision and understand the
effect of insulin, physical activity, and
nutrition on blood glucose levels.

hyperglycemia and required
accommodations for those
students; and level 3 training for
a small group of school staff
members who will perform
student-specific routine and
emergency care tasks such as blood
glucose monitoring, insulin
administration, and glucagon
administration when a school nurse
is not available to perform these
tasks and which will include level 1
and 2 training as well.

3. 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.

4. Accessibility to scheduled insulin at
times set out in the student’s
DMMP as well as immediate
accessibility to treatment for
hyperglycemia including insulin
administration as set out by the
student’s DMMP.

5. A location in the school that
provides 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 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 DMMP.

6. School nurse and back-up trained
school personnel who can check
blood glucose and ketones and
administer insulin, glucagon, and
other medications as indicated by
the student’s DMMP.

7. School nurse and back-up trained
school personnel 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 will also notify the
parent/guardian in advance of any
expected changes in the school
schedule that affect the student’s
meal times or exercise routine and
will remind young children of snack
times.

8. Permission for self-sufficient and
capable students to carry
equipment, supplies, medication,
and snacks; to perform diabetes
management tasks; and to have cell
phone access to reach parent/
guardian and health care provider.

9. Permission for the student to see
the school nurse and other trained
school personnel upon request.

10. Permission for the student to eat a
snack anywhere, including the
classroom or the school bus, if
necessary to prevent or treat
hypoglycemia.

11. Permission to miss school without
consequences for illness and
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.

12. Permission for the student to use
the restroom and have access to
fluids (i.e., water) as necessary.

13. An appropriate location for insulin
and/or glucagon storage, if
necessary.

14. A plan for the disposal of sharps
based upon an agreement with the
student’s family, local ordinances,
and Universal Precaution
Standards.

15. Information on serving size and
caloric, carbohydrate, and fat
content of foods served in the
school (27).

The school nurse should be the key
coordinator and provider of care and
should coordinate the training of an
adequate number of school personnel
as specified above and ensure that if the
school nurse is not present at least one
adult is present who is trained to
perform these procedures in a timely
manner while the student is at school,
on field trips, participating in school-
sponsored extracurricular activities,
and on transportation provided by the
school or day care facility. This is
needed in order to enable full
participation in school activities
(3,18,20). These school personnel need
not be health care professionals
(3,9,20,28,33,35).

It is the school’s responsibility to provide
appropriate training of an adequate
number of school staff on diabetes-
related tasks and in the treatment of
diabetes emergencies. This training
should be provided by the school nurse or
another qualified health care professional
with expertise in diabetes. Members of
the student’s diabetes health care team
should provide school personnel and
parents/guardians with educational
materials from the American Diabetes
Association and other sources targeted to
school personnel and/or parents. Table 1
includes a listing of appropriate resources.

III. Expectations of the Student in
Diabetes Care

Children and youth should be allowed to
provide their own diabetes care at
school to the extent that is appropriate
based on 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 variable and depend on
the individual, and a child’s capabilities
and willingness to provide self-care
should be respected (18).

1. Toddlers and preschool-aged
children: unable to perform diabetes
tasks independently and will need an
adult to provide all aspects of
diabetes care. Many of these
younger children will have difficulty
in recognizing hypoglycemia, so it is
important that school personnel are
able to recognize and provide
prompt treatment. However,
children in this age range can usually
determine which finger to prick, can
choose an injection site, and are
generally cooperative.

2. Elementary school–aged children:
depending on the length of diagnosis
and level of maturity, may be able to
perform their own blood glucose
checks, but usually will require
supervision. Older elementary
school–aged children are generally
beginning to self-administer insulin
with supervision and understand the
effect of insulin, physical activity, and
nutrition on blood glucose levels.
Table 1—Resources for teachers, child care providers, parents, and health professionals

<table>
<thead>
<tr>
<th>Resource</th>
<th>Source</th>
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*Available in the American Diabetes Association’s Education Discrimination Packet by calling 1-800-DIABETES.

Unless the child has hypoglycemic unawareness, he or she should usually be able to let an adult know when experiencing hypoglycemia.

3. Middle school– and high school–aged children: usually able to provide self-care depending on the length of diagnosis and level of maturity but will always need help when experiencing severe hypoglycemia. Independence in older children should be encouraged to enable the child to make his or her decisions about his or her own care.

Students’ competence and capability for performing diabetes-related tasks are set out in the DMMP and then adapted to the school setting by the school health team and the parent/guardian. 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. Ultimately, each person with diabetes becomes responsible for all aspects of routine care, and it is important for school personnel to facilitate a student in reaching this goal. However, regardless of a student’s ability to provide self-care, help will always be needed in the event of a diabetes emergency.

MONITORING BLOOD GLUCOSE IN THE CLASSROOM

It is best for a student with diabetes to monitor blood glucose levels and 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 and hyperglycemia 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 DMMP (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

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 affecting 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 monitor their blood glucose levels.
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, light-headedness, irritability, confusion, and drowsiness. In younger children other symptoms may include inattention, falling asleep at inappropriate times, unexplained behavior, and temper tantrums. 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 with glucagon as per the student’s DMMMP (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 and insufficient insulin can lead to 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).

Acknowledgments. The American Diabetes Association thanks the members of the Health Care Professional Volunteer Writing Group for this updated statement: William Clarke, MD; Larry C. Deeb, MD; Paula Jameson, MSN, ARNP, CDE; Francine Kaufman, MD; Georgeanna Klingensmith, MD; Desmond Schatz, MD; Janet H. Silverstein, MD; and Linda M. Siminerio, RN, PhD, CDE.

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