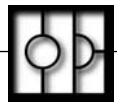

Feature Article

Providing a Safe Environment for Students with Diabetes

Janet H. Silverstein, Crystal C. Jackson, Nichole Bobo, Francine R. Kaufman, Sarah Butler, and Katie Marschilok

ABSTRACT

Current diabetes regimens require more effort than ever before. The level of diabetes control students are able to maintain is affected greatly by their ability to care for their diabetes during the school day. This article reviews use of School Health Plans and Diabetes Medical Management Plans in schools. Students with diabetes, their families, health care providers and school personnel all have responsibilities that should be outlined in these plans. School nurses coordinate school-based diabetes care, provide training to school staff members, advocate for students and monitor implementation of students' school plans. Normal growth and development, prevention of complications and full participation in academic and social opportunities should be possible for students with diabetes. A variety of resources that support students with diabetes are described and referenced.

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INTRODUCTION

After the child's home, school represents the second most influential environment in a child's life.[1] Children with diabetes and their families are taught that optimal diabetes care involves frequent blood glucose monitoring, timing and monitoring of meals for carbohydrate content, and daily physical activity. All children with type 1 diabetes and some children with type 2 diabetes also require multiple daily injections of insulin by syringe, pen, insulin pump, or pod. It is essential that children with diabetes receive the needed support and assistance required to perform these tasks in the school setting with minimal disruption of their education. The goals of diabetes management in school are to optimize the educational experience of the student; promote normal growth, development and socialization; and prevent hypoglycemia, hyperglycemia and long-term complications.

Each child with diabetes is unique, and each child requires a Diabetes Medical Management Plan (DMMP) that is designed for his or her specific needs.[1] Whereas diabetes management for adults may be somewhat uniform, children are constantly changing and as they grow and enter puberty, the DMMP must be altered to address changes in blood glucose levels and pubertal insulin resistance. Responsibilities of the school are dependent upon the child's ability to perform diabetes self-management tasks. Insulin administration and blood glucose monitoring require certain psychomotor skills that may not be present in younger children. Understanding what to do with blood glucose levels requires cognitive skills, and young children or those with de-

Janet H. Silverstein is a professor and chief in the Pediatric Endocrinology Department, University of Florida, Gainesville, FL 32608; E-mail: silvejh@peds.ufl.edu. Crystal C. Jackson is the associate director Government Relations & Advocacy, American Diabetes Association, Alexandria, VA 22311; E-mail: cjackson@diabetes.org. Nichole Bobo is a Nursing Education director, National Association of School Nurses, Silver Spring, MD 20910; E-mail: nbobo@nasn.org. Francine R. Kaufman is the chief medical officer and Emeritus professor of Pediatrics, Keck School of Medicine, University of Southern California, Los Angeles, CA 90027; E-mail: fkaufman@chla.usc.edu. Sarah Butler is the Diabetes Education director, National Association of School Nurses, Silver Spring, MD 20910; E-mail: sbutler@nasn.org. Katie Marschilok is a clinical manager, Medtronic Diabetes, 4 Fairlawn Lane, Troy, NY 12180; E-mail: katie.k.marschilok@medtronic.com.

velopmental disabilities may not be able to determine appropriate treatment responses to blood glucose results. Varied levels of assistance are needed to ensure effective diabetes management for these children at school. These variables notwithstanding, all students with diabetes require assistance when they are experiencing moderate to severe hypoglycemia. Assistance may include the administration of glucagon. The needs of students with diabetes must be met in the school setting to meet federal law requirements and to ensure the safety of the student with diabetes.[2]

The child's personal diabetes health care team (physician, diabetes educator, dietitian and social worker, or psychologist) with input from the parent or guardian, develops the DMMP.[3] Implementation of the child's DMMP at school requires communication among a number of key individuals who collectively comprise the school health care team (the student, student's family, school nurse and other health personnel, trained non-medical personnel, school administrator or principal, the student's teacher(s), the guidance counselor and other relevant staff). To provide a supportive school environment, it is important that team members understand their roles in managing the child with diabetes. A safe school environment requires participation of all school personnel, with special training given to those with whom the child has contact.

This paper is based on the National Diabetes Education Program (NDEP) publication "Helping the Child with Diabetes Succeed: A Guide for School Personnel." It can be accessed at: http://ndep.nih.gov/media/Youth_NDEPSchoolGuide.pdf

TREATMENT

Multiple advances over the past decade have revolutionized treatment of diabetes in youth. Evidence suggests that frequent blood glucose monitoring and insulin administration three or more times a day can result in improved blood glucose control and decreased rate of complications of diabetes.[4,5] As a result, there is a proliferation of new insulins, blood glucose monitoring technologies and insulin delivery systems that enable diabetes management to be optimized and intensified. Thus, the main goal of treatment is to achieve and maintain blood glucose levels as close to normal as is safely possible. To achieve this goal, insulin therapy must be customized to fit the child's preferred lifestyle. Most diabetes care providers now instruct patients to follow flexible eating patterns and activity and to adjust their insulin doses accordingly, rather than asking patients to adhere to a rigid meal plan and insulin dose, as had previously been prescribed.

As diabetes management technology has progressed, enabling new tools for improved diabetes management, schools are being asked now to perform more diabetes related tasks than in the past. For example, only a decade ago, most children were not on a basal-bolus regimen. With the current widespread use of basal-bolus regimens supervision of insulin administration, and sometimes the actual performance of the care task by the school nurse or another trained school staff member, is needed. Based on the student's level of skill and maturity, a child may need help with checking blood glucose levels, giving insulin and determining the insulin dose based on the child's carbohydrate ratio in order to determine food eaten and the correction factor to cover high blood glucose concentrations. School personnel must have the information they need to recognize signs of hypoglycemia and hyperglycemia and to be knowledgeable about how to manage blood glucose levels outside the child's target range, including how to give an injection of glucagon if the child is hypoglycemic and unable to take glucose by mouth.

The school nurse is responsible for coordinating school-based diabetes care. The school nurse has the skills, knowledge base and statutory authority to meet the health care needs of the student. However, not every school has a full time nurse, and, even for those schools with nurses, the nurses may be sick, on vacation, or attending to another emergency. Their work day rarely includes after-school hours, when the student participates in extra-curricular activities. There needs to be trained and knowledgeable individuals who can meet the child's diabetes health care needs during the entire school day and all school-sponsored activities, including before and after school events. Non-medical personnel should be trained to perform diabetes care tasks when a school nurse is not present.

SCHOOL HEALTH PLANS

Written plans that outline each student's diabetes health care needs are essential to facilitate a safe environment in school for the student with diabetes. Written plans become the communication tool used among students, their families, the school health care team and the student's personal diabetes health care team so that each individual knows what is expected. These expectations should be outlined in writing in several documents as outlined below.

The *Diabetes Medical Management Plan* (DMMP), developed by the student's personal diabetes health care team, contains the prescribed diabetes care regimen, tailored for each student. The DMMP contains medical orders developed by the student's personal diabetes health care team and should be signed by the student's health care provider. Information in the DMMP may include the following:

- Date of diagnosis
- Specific medical orders
- Emergency contact information
- 72-hour disaster or emergency plan
- Student's willingness and ability to perform self-management tasks at school
- List of diabetes equipment and supplies
- Frequency of blood glucose monitoring
- Insulin, glucagons and other medications to be given at school
- Meal and snack plan
- Exercise requirements
- Specific signs, symptoms and prescribed treatment for hypoglycemia
- Specific signs, symptoms and prescribed treatment for hyperglycemia

The *Quick Reference Diabetes Emergency Plan* is based on the medical orders in the student's DMMP and developed by the school nurse. This plan describes how to recognize and treat hypoglycemia and hyperglycemia and should be distributed to all school personnel who have responsibility for students with diabetes.

The *Individualized Health Care Plan* (IHP), based on the medical orders found within the DMMP and developed by the school nurse, outlines individualized diabetes management strategies for implementing the student's DMMP in the school setting. The IHP incorporates an assessment of the school environment as well as student-specific information (familial, psychosocial and developmental information). School nurses use the information from the DMMP and additional assessment findings to outline diabetes management strategies and personnel needed at school to meet the student's health goals as outlined in the DMMP. The IHP is reviewed with the student and family before it is implemented. Establishing a timeline to revisit the plan periodically to evaluate progress toward desired health goals throughout the school year is essential for ensuring the student's safety, well-being and academic success. Information in the IHP may include:

- Plan to maintain blood glucose within the range ordered by the healthcare provider
- Guidelines for communicating with the family and healthcare provider
- List of trained diabetes personnel and the diabetes care tasks they will perform
- Timeline for supervision of trained diabetes personnel
- Routine for monitoring blood glucose (where to check, how often, where supplies should be kept)
- Time frame for ongoing review of student outcomes
- Strategies to ensure that the student avoids inappropriate penalties for health appointments and illness, and receives accommodations during the school day
- Plans to educate school personnel (substitute teachers, bus drivers, physical education instructors, cafeteria personnel)
- Plan for the student who independently manages at school

Education plans, such as the Section 504 Plan (504 Plan) developed pursuant to Section 504 of the Rehabilitation Act of 1973 or the Individualized Education Program (IEP), developed under the Individuals with Disabilities Education Act protect students with disabilities. These plans are developed in collaboration with the school health care team and lay out the health care-related aids, services and accommodations as well as any special education services the student may need as the school year unfolds. The 504 Plan, IEP, or other written education plan, should include at least:

- Where and when blood glucose monitoring and treatment will take place
- When and where insulin will be administered
- Identification of school personnel who are trained to monitor blood glucose, administer insulin and glucagon, and treat hypoglycemia and hyperglycemia
- Who has primary responsibility for the student's diabetes care during the school day and during school sponsored events that take place before, after school, or on weekends
- Location of the student's diabetes management supplies
- Free access to the restroom and water
- Nutritional needs, including provisions for meals and snacks
- Full participation in all school-sponsored activities and field trips, with coverage provided by trained diabetes personnel
- Alternative times and arrangements for academic exams if the student is experiencing hypoglycemia or hyperglycemia
- Permission for absences, without penalty, for health care appointments and prolonged illness
- Maintenance of confidentiality and the student's right to privacy

RESPONSIBILITIES OF THE CHILD, FAMILY, SCHOOL PERSONNEL AND PRINCIPAL

Child

Responsibilities of the student depend on the age of the child. The child in elementary school may not be able to check blood glucose levels independently and will always need to be supervised. Many students in middle school and high school, on the other hand, may be responsible and knowledgeable about their diabetes care and may be able to perform blood glucose checks independently. In general, older students, because of their greater maturity and skill, may be fully in charge of their own insulin administration at school. Older students should know when to check blood glucose levels and when to eat meals and administer insulin at appropriately scheduled times. All students who are self-managing their insulin injections and blood glucose monitoring should be responsible for discarding lancets, needles and other supplies used for insulin administration and blood glucose monitoring appropriately.

Family

The parent or guardian of the child with diabetes is responsible for providing the DMMP to the school nurse and for meeting with the school health care team to participate in development and implementation of the IHP. Family participation in an annual 504 or IEP meeting will clarify both family and school expectations with regard to the student's diabetes management, including a thorough discussion about scheduled insulin administration, indications for giving additional insulin, and glucose monitoring.

The family is responsible for providing and maintaining all diabetes supplies at school for the child and should make sure that all needs are met during school-related activities. The storage location for all necessary diabetes supplies should be clearly stated. Other parent or guardian responsibilities include: providing signed permission for school personnel and the child's personal diabetes health care team in order to share information regarding the student's diabe-

tes; providing and maintaining all diabetes supplies; and informing the school of any changes in the child's DMMP.

Food service personnel should provide the parent or guardian with the carbohydrate content of the foods served in the cafeteria, and the parent or guardian should discuss with the school nurse the importance of correct insulin dosing as directed by the DMMP. If children bring their lunch to school, the parent or guardian should provide the carbohydrate content for these foods to the school nurse to allow accurate insulin dosing.

SCHOOL PERSONNEL

Three levels of training are needed to keep students with diabetes safe at school. *Level 1* training is for all school staff members and teaches everyone how to recognize hypoglycemia and hyperglycemia and who to contact for help. *Level 2* training builds on *Level 1* and is designed for all school staff members who have responsibility for the student with diabetes throughout the school day, providing them with additional understanding about diabetes and its impact upon the student. Specific instruction on the student's Quick Reference Diabetes Emergency Plan must be included. Finally, *Level 3* training is for any school staff members designated as trained diabetes personnel by the school nurse, or other qualified health care professional, who will perform or assist a student with diabetes care tasks, that often include blood glucose monitoring and insulin and glucagon administration.

Principal

The school principal is responsible for making certain that school personnel understand and comply with federal and state laws that may apply to students with diabetes, including Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act and the Individuals with Disabilities Education Act.

ROLE OF THE SCHOOL NURSE

The school nurse is the health professional who has responsibility for assuring that children with diabetes receive diabetes care according to the DMMP formulated by the student's personal diabetes health care team. To perform the DMMP successfully, the nurse must obtain and review the student's current DMMP and pertinent information from the family. Based on this information and other information gathered by the school nurse, the IHP is developed. Once approved and implemented, the IHP must be reviewed and updated throughout the school year. The school nurse also is responsible for coordinating development of a *Quick Reference Diabetes Emergency Plan* based on the DMMP and for providing copies of this plan to staff members who have responsibility for the student throughout the school day (e.g., teachers, coach, physical education teacher, lunchroom staff and bus driver). For those students with diabetes who also qualify for a 504 plan or IEP, it is critical that the school nurse participate in development and ongoing supervision of these plans.

All diabetes care tasks outlined in the student's DMMP must be provided at school. The amount of direct care provided by the school nurse in implementing these tasks will vary depending on individual needs of the child and availability of the school nurse. In addition, accurate and confidential documentation is required, as well as ongoing supervision and evaluation of the student.

When available, the school nurse is the most appropriate person to implement the student's written plans. When a school nurse is not readily available, the diabetes medical community has found that under supervision non-medical personnel, sometimes called "trained diabetes personnel," can be available to perform diabetes care tasks safely in the school setting. This position is trained and supervised by the school nurse and can be held by any school staff member, including teachers, health aides and school office personnel.

Diabetes care tasks may include blood glucose monitoring, insulin and glucagon administration, and urine or blood testing for ketones. Whereas requirements of federal laws must be met, assignment of diabetes care tasks by the school nurse or other health care professional must take into account state laws that may be relevant in determining which tasks are performed by trained diabetes personnel.

As the student's advocate, and with permission of the student's personal health care team and parent or guardian, the school nurse is expected to encourage independence with all diabetes care tasks at school, consistent with the student's level of maturity and skill. The school nurse role is imperative in reaching the goals of providing a student with an optimal educational experience, promoting normal growth and development, and preventing hypoglycemia, hyperglycemia, and long term complications of diabetes.

SUMMARY

Goals for effective diabetes management at school are shared by many individuals. These goals include providing a positive school experience, promoting full participation at school, supporting normal growth and development, reducing risk of diabetes related emergencies and the long-term risks of diabetes, and ensuring that students are safe and ready to learn.[2,6,7] Many resources exist to assist in meeting these goals. The National Diabetes Education Program's School Guide, *Helping the Student with Diabetes Succeed,*[8] provides tools and guidance to help schools ensure the child with diabetes is medically safe and ready to learn. The American Diabetes Association has multiple resources available from their website, including a sample DMMP and 504 plan, and training materials for school personnel titled *Diabetes Care Tasks at School: What Key Personnel Need to Know.* The National Association of School Nurses offers a live continuing education program for school nurses called H.A.N.D.S.[SM], (Helping Administer to the Needs of the Student with Diabetes in School) where school nurses receive current diabetes management information as well as forms and tools to develop and implement diabetes plans in the school setting. A collaborative relationship between the family, the school health care team and

the child's personal diabetes team is the key to a safe and successful educational experience for the child.

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