Virginia Diabetes Medical Management Plan and Protocol
A Supplement to the National Diabetes Education Program's
Helping the Student with Diabetes Succeed: A Guide for School Personnel

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I. Purpose, Use and Acknowledgments

The Virginia Diabetes Medical Management Plan & Protocol: A Supplement to the National Diabetes Education Program's *Helping the Student with Diabetes Succeed: A Guide for School Personnel* is a guide to be used to educate and inform the school nurse, school administrators, and other school personnel about diabetes and how to best meet the needs of students with diabetes. This guide should be used to promote and ensure excellence, safety and support for children with diabetes in our schools. These materials are meant to be used in conjunction with more comprehensive materials referenced later in this document. This document should serve as a quick reference for those caring for children with diabetes in the school setting.

The Virginia Diabetes Council (VDC) is grateful to all the people who offered their expertise, dedication and assistance to develop this guide. The current version was formalized and reviewed by a multi-disciplinary group of leaders in the care of children with diabetes who are listed below.

In addition to the National Diabetes Education Program (NDEP) school guide referenced above, additional background information, guidance and direction for the initial development of this guide were provided by the Health Services Supervisors/Coordinators of the following Virginia school districts: Chesapeake, Hampton, Newport News, Portsmouth, Suffolk, Virginia Beach, and additional input was provided by: Norfolk, Poquoson, and Williamsburg/James City County. The VDC's Education and Empowerment Workgroup assisted with this initiative that meets the Virginia Diabetes Plan 2008-2017's goal to develop a standardized management plan for children with diabetes.

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II. Introduction and the Team Approach

Diabetes is one of the most common chronic diseases in school-aged children, affecting about 186,300 young people in the United States, or 0.2 percent of people under 20 years of age. According to recent estimates, about 18,700 youths are diagnosed with type 1 and type 2 diabetes each year. Approximately 1 in every 400-500 children and adolescents has diabetes.

In 2005, there were more than a half million adult Virginians with diabetes. Currently, there are no state-level data sources available to estimate the prevalence of diabetes in youth under the age of 18. However, based upon national data, there are approximately 4,500 children in Virginia with diabetes. Chances are you may already have or will have a student with diabetes in your care.

Diabetes is a serious chronic disease in which blood glucose (sugar) levels are above normal due to defects in insulin production, insulin action, or both. The sixth-leading cause of death by disease in the United States, long-term complications of diabetes include heart disease, stroke, blindness, kidney disease, and amputation of the foot or leg. Although there is no cure, diabetes can be managed and complications can be delayed or prevented.

Diabetes must be managed 24 hours a day, 7 days a week. For students with type1 diabetes, and for some with type 2 diabetes, that means careful monitoring of their blood glucose levels throughout the school day and administering multiple doses of insulin by injection or with an insulin pump to control their blood glucose and minimize complications. Communication and coordination are key components to successful diabetes care and management at school. As a result, the school health team, which includes the school nurse, office personnel, teachers, coaches, lunchroom staff, and other school staff members, plays an important role in helping students manage their diabetes. Proper diabetes care and management at school benefits everyone.

The school health team works together to provide care and supervision for each student with diabetes. The school health team accomplishes this through the implementation of the available forms and medical orders developed as a component of the Virginia Diabetes Medical Management Plan & Protocol (DMMPP). The medical orders are completed by the student's personal diabetes health care team which can include his or her physician, diabetes nurse educator, dietician, psychologist, and others. Then, using the strategies outlined by the school nurse, the medical component should be incorporated into the student's Individualized Health Care Plan (Section IX (I)). In addition, the school health team should be part of the group that develops and implements the student's Section 504 Plan, Individualized Education Program (IEP), or other education plan that addresses the student's health care-related aids, services, accommodations, and any special education services the student may need to manage diabetes safely and effectively in school.

III. Legal Considerations and Written Plans

Federal Laws

There are three federal laws that provide protection to students with disabilities, including diabetes:

- Americans with Disabilities Act of 1990 (ADA) (as amended by the Americans with Disabilities Act Amendments of 2008)
- Section 504 of the Rehabilitation Act of 1973 (Section 504)
- Individuals with Disabilities Education Act (IDEA)

ADA prohibits discrimination on the basis of disability by all public and private schools, day care centers, and camps, except those operated by religious institutions. To be protected by ADA, the students must have a disability that substantially limits a major life activity such as caring for oneself, eating, or performing manual tasks. A major life activity may also include certain bodily functions, such as the function of the endocrine system. Learning need not be impacted in order for a student to qualify under ADA. A school may not consider the use of insulin or other medications (mitigating measures) when determining whether a student is substantially limited in a major life activity.

Section 504 prohibits discrimination on the basis of disability by all public schools and private schools that receive federal financial assistance. The definition of disability is the same as the definition under ADA. Under Section 504, students with disabilities must be given an equal opportunity to participate in academic, nonacademic, and extracurricular activities. Section 504 regulations require school districts to identify all students with disabilities and to provide them with a free and appropriate education (FAPE). A student does not have to receive special education services in order to qualify for related aides and services under Section 504. It is a common practice to include these related aids and services in a written document called a "Section 504 Plan." Section 504 is enforced by the Office for Civil Rights (OCR) in the U.S. Department of Education.

IDEA requires states to provide free, appropriate education to children with disabilities that make it more difficult for the child to learn so they can be educated to the greatest extent possible will all other children. To qualify for services under IDEA, a student's diabetes must adversely affect educational performance. An example of a student with diabetes who may qualify under IDEA is a student who may have difficulty paying attention or concentrating in a learning environment because of recurring high or low blood glucose levels that adversely affect the student's academic performance. IDEA regulations require that parents and school personnel work together to develop and implement an Individualized Education Program (IEP). IDEA is administered by the Office of Special Education Programs (OSEP) in the U.S. Department of Education.

These federal laws provide a framework for planning and implementing effective diabetes management in the school setting and for preparing the student's written education plans. While the requirements of federal laws must always be met, school administrators and nursing

personnel also should determine whether applicable state and local laws need to be factored into helping the student with diabetes.

Virginia State Law
(Code of Virginia, Title 8.01, Chapter 3, Article 21, § 8.01-225(A)(9) (1999); (PDF). Code of Virginia , Title 22.1, Chapter 14, Art. 2, § 22.1-274(E) (1999); **Specific, applicable excerpts from these codes can be reviewed in the appendices section (M)**

The 1999 Virginia General Assembly passed legislation which amended and reenacted the *Code of Virginia* to:

1. Allow any employee of a school board with authorization by a prescriber and appropriately trained to be exempt from liability when assisting with the administration of insulin or administering glucagon in an emergency.

2. Allow school board employee to refuse to obtain training in the administration of insulin and glucagon without fear of being disciplined, placed on probation, or dismissed.

3. Ensure that in school buildings of 10 or more instructional and administrative employees there are at least two or more employees trained in administration of insulin and glucagon if there is a student with diabetes in attendance.

4. Encourage local school boards to request of school health advisory boards procedures relating to children with acute or chronic conditions.

5. Allow any employee of a school board authorized by a prescriber with written parental permission and trained in administration of insulin and glucagon to administer insulin **or** glucagon.

6. Required the Board of Nursing to develop and revise as necessary, in coordination with the Boards of Medicine and Education, guidelines for training school employees in the administration of insulin and glucagon. The Virginia Board of Nursing Guidance Document #90-36 can be read in the appendices section of this document and is also are available for downloading at http://www.dhp.virginia.gov/nursing/guidelines/90-36.doc A copy of the Virginia law can be found in Section IX(M).

Other Relevant Federal Laws

The Family Education Rights and Privacy Act (FERPA) and the Health Insurance Portability and Accountability Act (HIPAA) govern privacy issues.

FERPA protects a student's privacy by prohibiting schools, with certain exceptions, from disclosing personally identifiable information in a student's education record without parental consent. FERPA does allow disclosure – without obtain consent – to school officials who have legitimate educational interests in the information.

HIPAA governs medical information maintained by private health care clinicians and how this information is to be safeguarded by policy, accountability, and physical and electronic protections.

Written Health Care Plans
Written plans outlining each student's diabetes management help students, their families, school personnel, and the student's personal diabetes health care team know what is expected of each of them. These expectations should be laid out in writing in the following health care plans:

- Virginia Diabetes Medical Management Plan (DMMP)
- Quick Reference Diabetes Emergency Plans
- Individualized Health Care Plan (IHP)

Virginia Diabetes Medical Management Plan
The Virginia Diabetes Medical Management Plan (DMMP) contains the medical orders prepared by the student's personal diabetes health care team and should be signed by the student's health care provider (see Section VII for an explanation of the **Virginia Diabetes Medical Management Plan**). The DMMP is the basis for all of the health care and education plans designed to help the student manage diabetes effectively at school. Although the DMMP plan is not required by Section 504, the ADA, or the IDEA, the information it contains is critical in addressing the requirements of these federal laws for the student with diabetes and must be in place for the student's diabetes care regimen to be implemented in the school.

The school nurse uses the information in the DMMP to develop the student's Individualized Health Care Plan and the Quick Reference Diabetes Emergency Plans. This information also should be incorporated into the Section 504, IEP, or other education plan.

Quick Reference Diabetes Emergency Plans
The Quick Reference Diabetes Emergency Plans for hypoglycemia and hyperglycemia are based on the medical orders in the student's Diabetes Medical Management Plan (see Appendix E and F for sample emergency plans). The school nurse usually will coordinate developing these plans.

Individualized Health Care Plan
The Individualized Health Care Plan (IHP) is a written plan developed by the school nurse in collaboration with the student's personal diabetes health care team and the family to implement the student's DMMP. The IHP, sometimes called the nursing care plan, is based on the medical orders in the student's DMMP and incorporates an assessment of the school environment as well as student-specific information (e.g., familial, psychosocial, and developmental information).

Written Education Plans
The school health team should be part of the group that plans how the DMMP will be implemented and what health care-related aids, services, accommodations and any special education services the student may need. This information should be included in any Section 504 Plan, Individualized Education Program (IEP), or other education plan and should be distributed to all school personnel who will be involved with implementing these plans.

504 Plan
A "504 Plan" is the commonly used term for a plan of services developed under Section 504 of the Rehabilitation Act and is developed by the 504 team that may include the school nurse, 504/IEP coordinator/school administrator, teacher, guidance counselor, and parent/guardian. For a downloadable sample plan go to:
http://www.diabetes.org/advocacy-and-legalresources/discrimination/school/504plan.jsp.

Individualized Education Program
An Individualized Education Program (IEP) is required for students who receive special education and related services under the Individuals with Disabilities Education Act (IDEA) and is developed by the IEP team that may include the school nurse, 504/IDEA coordinator, teacher, guidance counselor, and parent/guardian. The information in the DMMP and/or IHP should be used in developing either a 504 Plan or an IEP, but it is not a substitute for these plans.

It is strongly recommended that the information in the education plans be agreed upon before each school year begins (or upon diagnosis of diabetes) and written down and signed by a representative of the school and the parents/guardian. Written plans help ensure that school personnel, the parents/guardian, and students know their responsibilities. Parents must be notified in a timely manner of any proposed changes in the provision of services and be included in related discussions.

IV. Training

Many students will be able to handle all or almost all of their non-emergency diabetes care tasks by themselves. Others, because of age, developmental level, or inexperience, will need help from school personnel. Virginia state law requires a minimum number of trained personnel who can administer insulin and glucagon at every public school in which a child with diabetes is enrolled (see Appendix M).

While the school nurse is the most appropriate person in the school setting to provide care for a student with diabetes, many schools do not have a full-time nurse. Sometimes a single nurse must cover more than one school. Moreover, even when a nurse is assigned to a school full time, she or he may not always be available during the school day, during extracurricular activities, or on field trips.

Diabetes management is needed 24 hours a day, 7 days a week. In addition to the routine care required to meet daily needs, diabetes emergencies can happen at any time. School personnel need to be prepared to provide diabetes care at school and at all school-sponsored activities in which a student with diabetes participates. The school nurse or another qualified health care professional and the school administrator play a major role in selecting and training appropriate staff and providing professional supervision and consultation regarding routine and emergency care of the student with diabetes.

All students with diabetes will need help with emergency medical care.

Care tasks performed by trained school personnel may include blood glucose monitoring, carbohydrate counting, insulin and glucagon administration, and urine or blood ketone testing. In addition to learning how to perform general diabetes care tasks, the trained school personnel should receive student-specific training and be supervised by the school nurse or another qualified health care professional.

Diabetes management training for school personnel is essential to ensure effective school-based diabetes management. Three levels of training are recommended.

Level 1. All school personnel should receive training that provides a basic understanding of diabetes, how to recognize the signs and symptoms of low blood glucose (hypoglycemia) and high blood glucose (hyperglycemia), and who to contact immediately in case of an emergency.

Level 2. Classroom teachers and all school personnel who have responsibility for students with diabetes throughout the school day should receive Level 1 training, plus training to carry out their individual roles and responsibilities and what to do in case of a diabetes emergency.

Level 3. To meet the requirements of Virginia state law (see Appendix M), a small group of school personnel should receive in-depth training about diabetes and routine and emergency care for each student with diabetes from a qualified health care professional, such as the school nurse, a physician, a certified diabetes educator, or a diabetes trained nurse. This training will help ensure that a school staff member is always available to help younger or less-

experienced students or those with additional physical or mental impairments perform diabetes care tasks (e.g., administering insulin, checking their blood glucose, or choosing an appropriate snack) and to help all students with diabetes in case of an emergency. (See Section III for Virginia Board of Nursing Training Guidelines and download Virginia's Insulin and Glucagon training manual at http://www.doe.virginia.gov/VDOE/Instruction/Health/insulin-glucagon.pdf.

V. What is Diabetes?

Diabetes is a chronic disease in which blood glucose (sugar) levels are above normal. People with diabetes have problems converting food to energy. After a meal, food is broken down into a sugar called glucose, which is carried by the blood to cells throughout the body. Insulin, a hormone made in the pancreas, allows glucose to enter the cells of the body where it is used for energy.

People develop diabetes because the pancreas produces little or no insulin or because the cells in the muscles, liver, and fat do not use insulin properly. As a result, the glucose builds up in the blood, overflows into the urine, and passes out of the body in the urine. Thus, the body loses its main source of fuel even though the blood contains large amounts of glucose. Over the years, high blood glucose, also called hyperglycemia, can lead to serious health problems.

When insulin is no longer made, it must be obtained from another source—insulin injections or an insulin pump. When the body does not use insulin properly, people with diabetes may take glucose-lowering medications (which can be taken orally or by injection), instead of, or in addition to, insulin. Neither insulin nor other medications, however, are cures for diabetes; they only help to control the disease.

Taking care of diabetes is important. If not managed effectively, diabetes can affect the blood vessels, eyes, kidneys, nerves, gums, and teeth, making it the leading cause of adult blindness, lower limb amputations, and kidney failure. Diabetes also increases a person's risk for heart disease and stroke. Some of these problems can occur in teens and young adults who develop diabetes during childhood. The good news is that research shows these problems can be greatly reduced, delayed, or possibly prevented through intensive treatment that keeps blood glucose levels near normal.

What are the types of diabetes?
The three main types of diabetes are type 1, type 2, and gestational diabetes.

Type 1 Diabetes
Type 1 diabetes, formerly called juvenile diabetes, is a disease of the immune system, the body's system for fighting infection. In people with type 1 diabetes, the immune system attacks the beta cells (the insulin-producing cells of the pancreas) and destroys them. Because the pancreas can no longer produce insulin, people with type 1 diabetes must take insulin daily to live.

Type 1 diabetes can occur at any age, but it occurs most often in children and young adults. Most cases of diabetes in children under age 10 are type 1 diabetes. Type 1 diabetes affects 5 to 10 percent of all people with diabetes and has been reported to be increasing by about 3 percent per year.

Symptoms
The symptoms of type 1 diabetes are due to an increase in the level of glucose in the blood and include increased thirst and urination, unexplained weight loss, and blurred vision. Affected children also may feel very tired all the time. These symptoms may be mistaken for severe flu or

another rapid-onset illness. If not diagnosed and treated with insulin, the child with type 1 diabetes can lapse into a life-threatening condition known as diabetic ketoacidosis (KEY-toe-asi-DOE-sis) or DKA. DKA is characterized by vomiting, sleepiness, fruity breath, and if untreated, coma and death. (For more information about DKA, see page 18).

Risk factors

Although scientists have made much progress in predicting who is at risk for type 1 diabetes, they do not yet know what triggers the immune system's attack on the pancreas' beta cells. They believe that type 1 diabetes is due to a combination of genetic and environmental factors that are beyond the individual's control. Researchers are working to identify these factors and to stop the autoimmune process that leads to type 1 diabetes.

Type 2 Diabetes

Type 2 diabetes, formerly called adult-onset diabetes, is the most common form of the disease. People can develop it at any age, even during childhood. Type 2 diabetes usually begins with insulin resistance, a condition in which muscle, liver, and fat cells do not use insulin properly. At first, the pancreas keeps up with the added demand by producing more insulin. In time, however, it loses the ability to secrete enough insulin in response to meals. To control their diabetes, people with type 2 diabetes may need to take glucose-lowering medications, insulin, or both.

Type 2 diabetes used to be found mainly in overweight adults ages 40 or older. Now, as more children and adolescents in the United States become overweight and inactive, type 2 diabetes is occurring in young people at an increasingly alarming rate.

Symptoms

Symptoms of type 2 diabetes in children may be similar to those of type 1 diabetes. A child or teen may feel very tired or thirsty and have to urinate often. Other symptoms include unexplained weight loss, blurred vision, frequent infections, and slow-healing wounds. High blood pressure or elevated blood lipids (cholesterol) may be a sign of insulin resistance. In addition, physical signs of insulin resistance may appear, such as acanthosis nigricans (A-can-tho-sis NIG-reh-cans), a condition in which the skin around the neck, armpits, or groin looks dark, thick, and velvety. This is often mistaken for poor hygiene.

Some children or adolescents (and adults) with type 2 diabetes may have no recognized symptoms when they are diagnosed. For that reason, it is important for the parents/guardian to talk to their health care providers about screening children or teens that are at high risk for type 2 diabetes.

Risk factors

Being overweight and having a family member who has type 2 diabetes are the key risk factors for type 2 diabetes. In addition, type 2 diabetes is more common in certain racial and ethnic groups such as African Americans, Hispanic/Latino Americans, American Indians, Alaska Natives, Asian Americans and Pacific Islanders, including Native Hawaiians. Other risk factors include low physical activity level, having a mother who has had gestational diabetes, having high blood pressure, high cholesterol, abnormal lipid levels, and polycystic ovary syndrome.

Gestational Diabetes

Gestational diabetes can develop during pregnancy and is caused by the hormones of the pregnancy or by a shortage of insulin. Although gestational diabetes usually goes away after the baby is born, the woman and her child are more likely to develop type 2 diabetes later in life.

VI. Effective Diabetes Care at School

Diabetes management involves monitoring blood glucose levels multiple times throughout the day, following an individualized meal plan, participating in regular physical activity, and administering insulin and/or glucose-lowering medications in an attempt to maintain blood glucose levels in the target range and to prevent hypoglycemia or hyperglycemia. Students with diabetes must have access to supplies and equipment in the classroom for immediate treatment of high and low blood glucose levels in order to minimize the time a child is out of the classroom, reduce stress and encourage learning.
Additional elements of effective diabetes management in school include staff training in diabetes management, planning for appropriate disposal of materials that come in contact with blood, planning for disasters and emergencies, planning for school-sponsored events outside the usual school day, and dealing with the emotional and social aspects of living with diabetes.

A. Blood Glucose Monitoring

One of the most important diabetes management tasks is regular monitoring of blood glucose levels. (See Appendix A) This can be done with a blood glucose meter. Some students use a blood glucose meter in combination with a continuous glucose monitoring system (CGMS) (See Appendix H).

Blood Glucose Meter
To use the blood glucose meter, the skin is pricked with a lancet at the side of the fingertip (this is called a finger stick), forearm, or other test site to obtain a drop of blood. The drop of blood is placed on a special test strip that is inserted in a glucose meter. The meter then gives the current blood glucose level. The fingertip should always be used if hypoglycemia is suspected.

Continuous Glucose Monitoring System
Some students use a continuous glucose monitoring system (CGMS), a device that records glucose levels throughout the day. The CGMS works through a sensor inserted under the skin that measures interstitial glucose levels at regular intervals and sends the values to a monitor which converts these values to corresponding blood glucose level. The monitor is carried or worn by the student in a pocket, a backpack, or a purse (some systems incorporate the monitor into the individual's insulin pump). The CGMS sets off an alarm when glucose levels are too high or too low. **The CGMS is not a replacement for blood glucose monitoring with a blood glucose meter.** It is a useful tool for identifying trends and can enhance the ability of the student's personal diabetes health care team to make needed adjustments to the student's diabetes care regimen. Treatment decisions and diabetes care regimen adjustments should not be based solely on CGMS results. Sensor glucose levels must be confirmed with a blood glucose meter. Appropriate action should then be taken in accordance with the student's Diabetes Medical Management Plan.

Frequency of Monitoring
The student's personal diabetes health care team generally recommends that students monitor their blood glucose with a meter several times during the school day. This usually occurs before

and sometimes after eating snacks and meals, before and/or after physical activity, or when there are symptoms of hypoglycemia or hyperglycemia. In some children, symptoms may be subtle; blood glucose should be monitored whenever symptoms are suspected. If indicated in the student's DMMP, the student should be allowed to check his or her blood glucose level in the classroom or any other location on campus or at a school activity.

Many students can monitor their own blood glucose levels, others will need supervision, and others will need to have this task performed by a school nurse or trained diabetes personnel. All students, even those who are independent with blood glucose monitoring, may need assistance when experiencing a low blood glucose level.

Students must be able to monitor their blood glucose levels and respond to levels that are too high or too low as quickly as possible. If recommended by the student's personal diabetes health care team, it is medically preferable to permit students to monitor their blood glucose level and respond to the results in the classroom, at any other campus location, or at any school activity. Taking immediate action is important to prevent symptoms of severe hypoglycemia such as coma or seizures and to prevent the student from missing class time.

Planning for Disposal of Materials That Come Into Contact with Blood
Blood glucose monitoring does not present a danger to other students or staff members when there is a plan for proper disposal of lancets and other materials that come into contact with blood. The school health team should agree on the plan, which should be consistent with standard precautions and local waste-disposal laws. Disposal of sharps may be in a container kept at school or in the student's personal container—a heavy-duty plastic or metal container with a tight-fitting lid. Used blood glucose test strips and other materials may be discarded in the regular trash. Check with the student's personal diabetes health care team about health and safety requirements in your area.

B. Hypoglycemia

Hypoglycemia, also called "low blood glucose" or "low blood sugar," is a serious condition associated with diabetes that can happen very suddenly and requires immediate treatment. Hypoglycemia can impair cognitive abilities and adversely affect academic performance.

Symptoms

Signs of Hypoglycemia:

Hunger	Sweating	Shakiness	Paleness	Dizziness
Confusion	Loss of coordination	Fatigue	Fighting	Crying
Day-dreaming	Inability to concentrate	Anger	Passing-out	Seizure

Hypoglycemia occurs when a student's blood glucose level falls too low, usually as a result of administering too much insulin, skipping or delaying meals or snacks, not eating the amount of food recommended in the meal plan, or getting too much, too intense, or unplanned physical activity. It is more likely to occur before lunch, at the end of the school day, during or after

physical education classes, or in the event of unanticipated physical activities (such as on a field trip). Hypoglycemia also may occur due to illness, particularly gastrointestinal illness. It also may occur for no obvious reason.

Hypoglycemia, which is not always preventable, is the greatest immediate danger to students with diabetes.

Hypoglycemia usually can be treated easily and effectively. If it is not treated promptly, however, hypoglycemia can lead to loss of consciousness and seizures and can be life-threatening. Early recognition of hypoglycemia symptoms and prompt treatment, in accordance with the student's DMMP, are necessary for preventing severe symptoms that may place the student in danger. This information, contained in the student's Quick Reference Diabetes Emergency Plan for Hypoglycemia, should be provided to all school personnel who have responsibility for the student with diabetes (see sample plan in Appendix E).

Hypoglycemia is not always preventable and not all students, especially young children, will recognize its symptoms with every episode. Some older children and adolescents may have hypoglycemia unawareness, which means they do not experience early physical warning signs such as shaking or jitteriness, sweating, or sudden behavior changes. Even students who usually recognize when their blood glucose is low may sometimes have sudden low blood glucose without symptoms. Therefore, all school personnel should know how to recognize hypoglycemia and what to do if they observe its onset. Hypoglycemia symptoms vary from episode to episode and will be different for every child.

Hypoglycemia can impair the student's thinking abilities and sometimes can be mistaken for misbehavior. If a student has a sudden change in behavior, becomes lethargic, argumentative, combative, unconscious, or is having a seizure (or convulsion), presume that the student has hypoglycemia. Treat the situation as a hypoglycemic emergency, contact the school nurse or trained diabetes personnel, and monitor the student's blood glucose level right away. If a blood glucose meter is not available in the immediate area, or if the blood glucose level is otherwise unknown, treat the student for hypoglycemia. Symptoms will progress if not treated immediately.

The student should *NEVER* be left alone or sent anywhere alone when experiencing hypoglycemia.

Notify the school nurse or trained school personnel as soon as mild to moderate symptoms of hypoglycemia are observed**.** Check the student's blood glucose level and give the student a quick-acting glucose (sugar) product equivalent to 15 grams of carbohydrate **(**or the amount specified in the Diabetes Medical Management Plan), such as:

- 3 or 4 glucose tablets or
- 1 tube of glucose gel or
- 4 ounces of sugar-containing juice or
- 6 ounces (half a can) of sugar-containing soda

Wait 10 to 15 minutes and recheck the student's blood glucose level. Repeat treatment if the blood glucose level still falls below the blood glucose target indicated in the DMMP/Quick Reference Diabetes Emergency Plan for Hypoglycemia. Once the blood glucose level is in target range, give a protein snack if it is more than 30 minutes to the next snack or meal. Contact the student's parents/guardian/medical team as directed on the DMMP. Repeated episodes of hypoglycemia should always be reported to the student's healthcare provider so that therapy adjustments can be implemented to prevent further episodes. Repeated hypoglycemia is associated with potential negative physical and psychological health issues and should not be ignored despite resolution in response to treatment.

Symptoms of severe hypoglycemia may include inability to eat food or drink fluids, unconsciousness, unresponsiveness, seizure activity, convulsions, or jerking movements. At this point, never attempt to give the student food or a drink or to put anything in the mouth because it could cause choking.

Severe hypoglycemia is treated by administering glucagon by injection. Glucagon is a hormone that raises blood glucose levels by causing the release of glycogen (a form of stored carbohydrate) from the liver. If a student becomes unconscious or unresponsive, or experiences convulsions or seizures, position the student on his or her side to prevent choking. Immediately contact the school nurse or trained school personnel who will administer an injection of glucagon, as indicated in the student's DMMP/Quick Reference Diabetes Emergency Plan for Hypoglycemia (see Appendix E). While the glucagon is being administered, another school staff member should call for emergency medical assistance (911) and then notify the parents/guardian. If administration of glucagon is not authorized, staff should call 911 immediately.

The parents/guardian should supply the school with multiple selections for treatment of mild-moderate hypoglycemia and a glucagon emergency kit. The school nurse and trained school personnel must know where the kit is stored and have access to it at all times. Supplies should be checked periodically to assure availability and to inspect expiration dates; caregivers should be notified whenever additional supplies are needed.

C. Hyperglycemia

Hyperglycemia means glucose levels above the target range. It may be caused by too little insulin or glucose-lowering medication, illness, infection, injury, emotional stress, ingestion of food that has not been balanced (or matched) by the appropriate amount of insulin, or decreased physical activity. Onset of hyperglycemia may occur over several hours or days.

Adjusting for High Blood Glucose Levels

Extra insulin might be needed if the student's blood glucose is above the target range before a meal or snack. The amount of extra insulin is calculated based upon an individual student's blood glucose correction factor, which is added to the carb dosage (see nutrition). The blood glucose correction **factor** is the amount of insulin the student needs to lower blood glucose to target level.

Signs of hyperglycemia:

Extreme thirst	Frequent urination	Blurry Vision	Hunger	Headache
Nausea	Hyperactivity	Dry Skin	Dizziness	Stomach ache

Hyperglycemia symptoms include increased thirst, frequent urination, nausea, blurry vision, and fatigue. In the short term, hyperglycemia can impair cognitive abilities and adversely affect academic performance. In the long term, even moderately high blood glucose levels can increase risk for serious complications such as heart disease, stroke, blindness, kidney failure, and amputations.

The school nurse or trained school personnel should be notified as soon as symptoms of hyperglycemia are recognized. Treatment of hyperglycemia may involve monitoring the student's blood glucose level, giving the student extra water or non-sugar-containing drinks (not fruit juices) slowly, but steadily, and administering supplemental insulin in accordance with the Quick Reference Diabetes Emergency Plan for Hyperglycemia (see Appendix F). Free and unrestricted access to the restroom and to liquids must be provided, as high blood glucose levels can cause increased urination and may lead to dehydration if the student cannot replace the fluids. Hyperglycemia can often be treated effectively at school and will not necessarily require that the student be restricted from attending classes or sent home.

Hyperglycemia Emergency: Progression to Diabetic Ketoacidosis (DKA)
Hyperglycemia does not usually result in a medical emergency. If, however, the student fails to take insulin, if a pump malfunctions and causes an interruption in insulin delivery, or if either physical or emotional stress causes the insulin not to work effectively, if untreated this condition may result in diabetic ketoacidosis.

DKA is the number one reason for hospitalization in children with known diabetes (85%) and usually is a result of not monitoring for ketones when blood glucoses are elevated or the child is sick and not contacting the child's medical provider at the onset of ketone production. Pediatric endocrinologists believe that these hospitalizations are 98% preventable. To accomplish this, ketone testing, immediate communication with the diabetes care provider and extra insulin are required. If the person is sick or nauseated, ketones can be present even when the blood glucose is not high and medical intervention will still be required. It should also be noted that management of ketones is the most common knowledge deficit among families of children with diabetes.

Ketones are the chemicals produced by the body makes when there insufficient insulin. The body then breaks down fat for energy. This may occur when blood glucose levels are very high and also when the student is ill. At first, ketones will be cleared by the kidneys into the urine but as their production increases, they may build up in the bloodstream causing a condition known as diabetic ketoacidosis (DKA), a medical emergency.

Symptoms
The symptoms of DKA can include nausea, vomiting, and stomach pain, dry mouth, extreme thirst, fruity breath. If untreated, DKA may cause deep breathing or breathing difficulties and increasing sleepiness or lethargy and a depressed level of consciousness and the physician and parent should be called (911 should be called if the physician cannot be reached immediately). DKA is a life-threatening medical condition. Any child with very large urine ketones or a blood ketone reading of > 3.0 should go directly to the emergency room. It is imperative that a child suffering from DKA be cared for in a facility experienced in treating pediatric patients or that care is coordinated with the physician caring for the child's diabetes.

Ketone Testing
Usually ketones are checked when blood glucose levels are greater than 250. Guidelines for testing ketones are written in the DMMP.

Treatment for Presence of Ketones
Generally, treatment for low level ketones will include supplemental insulin and extra water or non-sugar containing drinks. The student's physician and parent should be notified when ketones are moderate or greater so that the appropriate treatment can be determined.

It is generally recommended that physical activity be avoided if ketone levels are moderate or greater. In most cases, the child will need to go home, but only if the primary caregiver will be able to continue to monitor the child's condition and is competent in this area of diabetes management or the healthcare provider makes this determination. The student's DMMP will designate who should be called for ketone management.

D. Insulin

The DMMP, which will be different for each student, specifies the dosage, delivery system, and schedule for insulin administration. The Individualized Health Care Plan and the student's education plan, based on the DMMP, should specify who will administer prescribed insulin and under what circumstances.

Students with type 1 diabetes, and some students with type 2 diabetes, need to administer, or to be given insulin to cover the carbohydrate in a meal or snack. Students may need additional or corrective dosages of insulin to treat hyperglycemia or to cover a rise in blood glucose levels. If indicated in the student's DMMP, the student should be allowed to self-administer insulin in the classroom or any other location on campus or at a school activity.

Today, new types of insulin and new delivery systems help keep blood glucose levels within accepted ranges. These options, however, may require more frequent blood glucose monitoring and more assistance for the student with diabetes.

Insulin has three characteristics:
- Onset is the length of time before insulin reaches the bloodstream and begins lowering blood glucose levels.

- Peak is the time at which insulin is at its maximum strength in terms of lowering blood glucose levels.
- Duration is the number of hours insulin continues to lower blood glucose levels.

Most students with type 1 diabetes require multiple injections during the school day or they receive their insulin through a programmable insulin pump. For students using injections, there are several types of insulin that may be used in combination. The different types of insulin have been formulated to have immediate (rapid-acting or short-acting insulin), intermediate, or long (basal insulin); onset and duration of action. A coordinated combination of different types of insulin is used to allow for adequate treatment of diabetes at meals, snacks, during periods of physical activity, and through the night.

The shelf life of insulin after opening varies according to the type of insulin, the type of container (vial or cartridge), and how insulin is administered (through a syringe, a pen, or a pump). Review the product storage instructions on the manufacturer's package insert, investigate at the manufacturer's website or check with the healthcare provider for specific products. No insulin products should be used past the expiration dates on the package.

In general, most opened vials of insulin may be left at room temperature (below 86 degrees Fahrenheit) for 30 days and then discarded. Opened disposable pens or pen cartridges should not be refrigerated but left at room temperature for *less than* 30 days, depending on the type of insulin and the type of pen or cartridge. Unopened vials should be stored in a refrigerator. They may be used until their expiration date and then must be discarded. However, once the vial is opened, the insulin is usable for 30 days. Levemir and Novolog are usable for 42 days.

The three most common ways to administer insulin are with a syringe, an insulin pen, or an insulin pump. The manufacturers of insulin, insulin syringes, insulin pens, and insulin pumps have websites where school personnel can learn more about these products.
Insulin pens: http://www.childrenwithdiabetes.com/d_06_390.htm or
Insulin Pumps: http://www.childrenwithdiabetes.com/pumps/

Insulin syringes, available in several sizes, make it easier to draw up the proper dosage. Shorter, smaller needles make injections easier and relatively painless.

An insulin pen holds a "cartridge" of insulin. Insulin pens may be refillable for re-use or disposable. Pens which are refillable are typically not refrigerated and may actually incur damage to the LED components if refrigerated. A needle is screwed onto its tip just before use. When using a insulin pen it must be primed to rid the needle of air prior to every dose to assure accurate dosing. Review the product instructions for storage and priming instructions. The user dials the pen to the prescribed dose and injects the insulin. Ideally, a new needle tip should be used for every dose administered. Insulin pens are convenient and appropriate when children need a single type of insulin. They are used most often during the school day with rapid-acting insulin to cover a meal and/or to treat a high blood glucose level. It is important to read storage information and how long insulin pens may be used once opened. Insulin may lose its potency if used passed the recommended use date.

An insulin pump is a computerized device that is programmed to deliver small, steady doses of insulin throughout the day; additional doses are given to balance food intake or to lower high blood glucose levels. Pump users must test their blood glucose frequently to determine the doses they need.

Rapid-acting insulin usually is used in the insulin pump. The parents/guardian should provide the school with a back-up supply of syringes and rapid-acting insulin or insulin pens, and pen needles in the event of a pump failure. Supplies should be kept in a secured location.

There are two types of insulin pumps:

- The first type of pump looks like a pager and usually is worn on the student's waistband or belt. The pump holds a reservoir of insulin that is attached to an infusion set that leaves a very small needle or cannula under the skin. Some infusion sets are started with a guide needle, then the plastic cannula (a tiny, flexible plastic tube) is left in place, taped with dressing, and the needle is removed. The cannula usually is changed every 2 or 3 days or when blood glucose levels remain above the target range or ketones are present.

- The second type of pump, the pod or patch**,** is attached directly to the skin and a guide needle inserts the cannula under the skin automatically. The pod contains the insulin and there is no tubing. The pod type pump is controlled by a small hand-held computer device that is kept nearby.

Some students who need insulin during the school day are able to administer it on their own, others will need supervision, and others will need someone to administer the insulin for them. The school nurse and/or trained school personnel should assist with insulin administration in accordance with the student's health care and education plans.

School personnel responsible for assisting with the student's diabetes care tasks should be knowledgeable about and trained in using and operating each student's insulin delivery system in the event that a school nurse is not available to administer insulin. A nurse or another qualified health care professional should teach, monitor, and supervise trained diabetes personnel to administer insulin.

E. Physical Activity

Exercise and physical activity are beneficial for all children. Everyone can benefit from regular physical activity, but it is even more important for students with diabetes. In addition to maintaining cardiovascular fitness and controlling weight, physical activity can help to lower blood glucose levels.

All children with diabetes can participate fully in physical education classes and team sports. In order to maintain blood glucose levels in target ranges, adjustments may need to be made to insulin and food intake. It is also important to check blood glucose levels more frequently while being active to prevent hypoglycemia. The student's DMMP should specify when physical activity should be restricted because the blood glucose level is either too high or too low or if ketones are present.

Students using page type pumps may disconnect from the pump for sports activities; the pod type pump remains attached. If students keep the pump on, they may set a temporary, reduced insulin delivery rate or suspend use of insulin while they are playing. The student's DMMP should contain instructions.

Important Things to Know About Exercise and Diabetes

- Students **SHOULD NOT** exercise if child is experiencing hypoglycemia or if they have moderate or large ketones.
- Exercise and physical activity may cause low blood glucose.
- The effects of exercise on blood glucose lowering can last for up to 24 hours as glycogen stores are replenished in the muscles.
- Physical activity may cause high blood glucose due to adrenaline output.
- All children should aim for at least 30 minutes of daily activity at least 5 days per week.
- Blood glucose should be checked before, during, and after activity as needed.

Suggestions for Safe Exercise in the Child with Diabetes

- Check blood glucose before exercise.
- Check ketones prior to exercise if blood glucose is >300.
- Remember that everyone reacts differently to exercise. The only way to learn how the child reacts is to check blood glucose more frequently during activity.
- Eat a snack before exercise if needed. A good rule of thumb is 15 grams of carbohydrate for every 30 minutes of vigorous activity. Protein may be needed if the activity will be continued over a longer period of time. (See Appendix L).
- Always have extra snacks on hand.
- Carry a fast acting sugar to treat hypoglycemia.
- Be sure there is a current glucagon kit handy in case of emergency.
- Do not correct a high blood glucose level immediately after exercise.
- Drink extra water or sugar-free fluids before exercising. A good rule of thumb is 8 oz for every 30 minutes of vigorous activity.
- Do not exercise alone.
- Wear a diabetes ID bracelet or necklace.
- Consider the injection site and type of activity. Insulin will be absorbed more quickly if given in a spot that will be used during the activity. For example, avoid the leg if child will be running or avoid the arm if child will be playing tennis. The stomach is usually a good site for pre-exercise injections.
- Think about peak action times of insulin and adjust insulin doses as needed to prevent hypoglycemia in accordance with the DMMP.

(See Section IX Appendix (L) for suggested carbohydrate coverage for physical activity).

F. Nutrition

In the past, meal planning for diabetes was much less flexible and often students were prescribed a rigid meal plan using "exchange lists" to match insulin dosing. Current nutrition recommendations for children with diabetes are designed to provide maximum flexibility to meet each child's nutritional needs, appetite, eating habits and schedules to match their insulin intake.

The student's diabetes care regimen, as set out in the written health care plans, must be followed to avoid hypoglycemia or hyperglycemia.

The nutritional needs of students with diabetes do not differ from the needs of students without diabetes. All students need a *variety of healthy* foods to maintain normal growth and development. The meal plan recommended for students with diabetes is usually good for everyone. The major difference is that the timing, amount, and content of the food that students with diabetes eat, especially the carbohydrates (carbs), are carefully matched to balance the action of the insulin and other medications that they take.

While there usually are no forbidden foods for people with diabetes, students are advised to avoid "liquid carbs," including sugar-containing drinks such as soda pop, fruit juices (including 100 percent fruit juice), sweet tea, and sports/energy drinks when making beverage and snack choices. These "liquid carbs" raise blood glucose rapidly, contain large amounts of carbs in small volumes, are hard to balance with insulin, and provide little or no nutrition. For the majority of individuals, these items are to be reserved for the treatment of hypoglycemia.

Many children with type 2 diabetes follow a meal plan designed to help them achieve a healthy weight. These students may be prescribed a calorie level target for the day as well as consistent carb amounts to aim for at each meal and snack to help control their weight and blood glucose. Assuring that healthy foods such as whole grains, low-fat protein and dairy, fruits, and vegetables are available is critical to their diabetes management.

Carbohydrate Counting

Most students with diabetes have an individualized meal plan using a method of carbohydrate counting. The meal plan takes into account the student's nutritional needs, insulin regimen, oral medications, and physical activity level.

Carb counting involves calculating the number of grams of carbohydrate, or choices of carbohydrate, the student eats. One carb choice equals 15 grams of carbohydrate. Sources of carbs include starches (grains, starchy vegetables, and beans), fruits, milk, yogurt, and sweets.

The carb content of foods served in the school cafeteria should be provided to the parents/guardian and the student by the food service staff. If the food service manager or the school district does not have this information, the school can identify a registered dietitian through the local chapter of the American Dietetic Association who can work with the food service staff to make this information available.

There are two methods of meal planning using carb counting: following a consistent carb meal plan and adjusting insulin for changing carb intake. This information will be provided in the student's DMMP.

- **Following a Consistent Carb Meal Plan** – Students who follow a consistent carb meal plan aim for a set amount of carb grams at each meal and snack and do not adjust their mealtime insulin for the amount of carb intake (e.g., 45 to 60 grams of carb at each meal, as shown in

the table on the following page). The student's personal diabetes health care team helps determine the amount of carbs that is right for each child at each meal. This method of meal planning is often used by students who take intermediate-acting insulin in the morning to balance with their lunch.

For students who follow a consistent carb meal plan, it is important to maintain consistency in the timing and content of meals and snacks. The student should eat lunch at the same time each day. Snacks often are necessary and must be eaten to balance with the peak times of insulin action and with physical activity.

Meal Carb Amounts by Age*		
	Children (ages 5- to12-years-old)	Teens
Boys	45 to 60 grams of carb at each meal	60 to 75+ grams of carb at each meal
Girls	45 to 60 grams of carb at each meal	45 to 75 grams of carb at each meal
Snacks, if needed, are usually 15 to 30 grams of carb.		
* Source: Evert, A. and Gerken S. Children with diabetes: Birth to adolescence. *On The Cutting Edge,* Summer 2006 Vol. 27:4, 4-8.		

- **Following a Changing Carb Intake Plan -** Students who use multiple daily injections or an insulin pump usually use this method of meal planning. This method requires adjusting insulin doses to cover the amount of carbs consumed using an **insulin-to-carb ratio. The insulin-to-carb ratio is the number of units of insulin needed to cover the number of grams of carb in the food the student plans to eat.**

  The insulin-to-carb ratio and the blood glucose correction factor are individualized and determined by the student's personal diabetes health care team. This information should be included in the student's DMMP.

Other Dietary-Related Medical Conditions

A small percentage of children with diabetes may have other medical conditions that require additional dietary restrictions. For example, about eight percent of children with type 1 diabetes have a condition called Celiac Disease. They should not eat any food products that contain gluten or that have been prepared in a gluten-contaminated environment. Gluten is found in many grains, including wheat, rye, and barley, which are found in many pastas, cereals, and processed foods. These dietary restrictions should be outlined in the student's DMMP.

G. Field Trips, Sports, and Special Event Planning

A student may not be excluded from field trips and other school-sponsored activities due to his/her diabetes. The same care provided at school should travel with them on field trips. Students often view field trips among the most interesting and exciting activities of the school

year. Students with diabetes must be allowed to have these school-related experiences. Although it is not unusual to invite the parents/guardian to chaperone field trips, parental attendance should never be a prerequisite for participation by students with diabetes.

Meeting the needs of students with diabetes requires advance planning for special events such as classroom parties, field trips, and school-sponsored extracurricular activities held before or after school. With proper planning for coverage by the school nurse or trained school personnel and possible adjustments to insulin dosage and meal plans, students with diabetes can participate fully in all school-related activities.

While there usually are no forbidden foods in a meal plan for students with diabetes, school parties often include foods high in carbohydrates and fats. Serving more nutritious snacks will be healthier for all students and will encourage good eating habits. The parents/guardian should decide whether the student with diabetes should be served the same food as other students or food provided by the parents/guardian. If possible, the parents/guardian should be given advance notice about parties to incorporate special foods in the student's meal plan or to adjust the insulin dosage.

The school nurse or trained school personnel should accompany the student with diabetes on field trips. They should ensure that all of the student's snacks and supplies for blood glucose monitoring, insulin administration, and treating hypoglycemia are packed and taken on the trip. Diabetes management strategies for school-sponsored field trips should be included in the student's written health care and education plans. If the student's parent/guardian chooses to participate in the field trip/event, discussions should occur with those attending as to whether the school nurse's or trained personnel's participation will be necessary.

The plan for coverage and care during school-sponsored extracurricular activities and field trips that take place outside of school hours and where the student with diabetes is a participant also should be carefully noted in the student's health care and education plans. As with field trips, the school nurse or trained diabetes personnel must be available at these activities. The school nurse, teachers, and parents should work together so that appropriate coverage is planned well in advance of the event.

The written documents that need to be consulted when preparing a student with diabetes for a field trip are:

A. Diabetes Medical Management Plan (DMMP)
B. Individualized Health Care Plan (IHP)
C. Section 504 Plan
D. Individualized Education Program (IEP)

It is important to make provisions for field trips in one of the above documents. All students should have a DMMP and IHP, many may also have a 504 Plan and/or an IEP. This would ensure a smooth and safe transition from classroom to an off-site learning environment. The provisions should include who will assist the student on the field trip

with his/her diabetes care. Field trip schedule and information should be provided to the parent and school nurse well in advance of the activity.

Supply Checklist for Field Trip (What should school personnel bring as a minimum):

- Copy of the DMMP
- Quick Reference Emergency Plan (plan for treatment of hypoglycemia/hyperglycemia, see Appendix E & F for example)
- Fast-acting carbohydrate
- Water
- Snacks
- Blood glucose testing equipment & supplies
- Insulin & insulin delivery system (pens & pen needles, syringes, etc)
- Ketone Strips
- Glucagon Kit
- Pump supplies, if applicable
- Extra batteries for meter, pump, etc., if applicable
- Additional supplies and insulin in case of delay in returning to school
- Cell phone to call for help if needed
- Emergency contact information

H. Self-Management and Age-Appropriate Skills

Diabetes care depends upon self-management. The students' competence and capability for performing diabetes-related care tasks should be specified in the DMMP and then applied to the school setting by the school health care team, as outlined in the student's Individualized Health Care Plan and education plan.

While students must receive assistance with and supervision of their diabetes care when needed, it is equally important to enable students to take on the responsibility of diabetes self-management with ongoing guidance and support from the parents/guardian, the student's personal diabetes care team, and the school health team. The age for transfer of responsibility from caregiver to child varies from student to student and from task to task because children develop and mature at different rates. Students' abilities to participate in self-care also depend upon their willingness to do so.

Ultimately, each person with diabetes becomes responsible for all aspects of self-care, including blood glucose monitoring and insulin administration in a progressive manner. Regardless of their level of self-management, however, all students with diabetes may require assistance when blood glucose levels are out of the target range. Regardless of their age, there are times when all children who have diabetes need someone else to share in their diabetes care tasks.

VII. Roles and Responsibilities of School Personnel, Parent/Guardian and Student

Pediatric diabetes management requires the involvement of a multi-disciplinary team of individuals which include healthcare professionals, school staff, and parents/guardians, and of course, the student with diabetes. Roles and responsibilities vary tremendously by age and from student to student. Several of the references contain helpful lists of age appropriate skills. The following lists are included to be used for clarification of roles and responsibilities of some of the team members. It is recommended that these pages be copied and distributed to the appropriate school diabetes team members.

A. Parent/Guardian Responsibilities

1. Inform the school nurse/school administrator that your child has diabetes when the student enrolls in school or is newly diagnosed.
2. Provide accurate emergency contact information and update as necessary.
3. Provide the Diabetes Medical Management Plan (DMMP), signed by your child's medical provider and yourself to the school nurse. **This plan must be <u>renewed</u> prior to the beginning of each school year.**
4. Inform school nurse/school administrator of any changes in the student's health status and/or DMMP.
5. Provide all supplies and equipment necessary for implementing your child's DMMP. Replenish supplies as needed (within 48 hours of notification).
6. Inform the school nurse and other appropriate school staff when the student plans to participate in school-sponsored activities (field trips, events, extra-curricular activities, sporting teams, etc.).
7. Authorize trained unlicensed school personnel to administer insulin and glucagon in the absence of a registered nurse.
8. Teach your child to:
    a. Understand age-appropriate diabetic care (refer to Student Responsibilities- see below.
    b. Communicate clearly to adults in authority that he/she has diabetes and is not feeling well.
    c. Inform you about his/her diabetes management during the school day.
    d. Wear a medical alert ID at all times.
9. Review Checklist for Parents (Appendix C).

B. Student Responsibilities (for students with diabetes who are able to take responsibility for their self-management)

1. Learn age-appropriate diabetes care.
2. Know the following:
    a. Who to contact and what to do when you feel symptoms of low or high blood glucose.
    b. What the written school plan says to help manage your diabetes.

c. When you should check blood glucose levels, give insulin, have a snack, and eat breakfast/ lunch.
d. Where the diabetes supplies are stored, if you do not carry them, and who to contact when you need to use them.

3. Take charge of your diabetes care at school as the DMMP allows. This **may** include:
   a. Monitoring and recording blood glucose levels.
   b. Calculating accurate insulin doses, if applicable.
   c. Self-administration of insulin/medications.
   d. Proper disposal of needles, lancets, and other supplies .
   e. Eating meals and snacks as prescribed and reporting intake as necessary for insulin dosing.
   f. Treating hypoglycemia and hyperglycemia (low & high blood glucose).
   g. Carrying and using diabetes equipment and supplies as directed.
4. Cooperate with school and healthcare personnel who are assisting you with & supervising your diabetes care.
5. Always wear medical alert ID.
6. Always carry a quick-acting source of glucose as recommended by your health care team.

C. Health Care Provider Responsibilities

1. Complete and sign a Diabetes Medical Management Plan (DMMP) for the student prior to the beginning of each school year or anytime an update is needed.
2. Authorize trained unlicensed school personnel to administer insulin and glucagon in the absence of a registered nurse in accordance with Virginia state law.
3. Assess student's ability to self-carry, then complete and sign the *Self Carry Authorization Form,* if appropriate (Part 4 of the DMMP).
4. Respond to requests for assistance with medical management in a timely manner or assign appropriate staff from your practice to address school diabetes management as required.
5. Serve as the medical treatment experts when questions concerning care arise and when staff training is necessary.

D. School Nurse Responsibilities

1. Obtain and review the student's current DMMP from the medical provider and review pertinent information with the family.
2. Conduct a nursing assessment of the student and develop an Individualized Health Care Plan (IHP) as indicated (Appendix B&I).
3. Participate in the development and implementation of the student's 504, Individualized Educational Program (IEP), or other education plan as indicated. (See Appendix O)
4. Conduct ongoing, periodic assessments of students with diabetes and update the nursing care plan.

5. Provide a Quick Reference Emergency Plan and other relevant diabetes information to staff members who have responsibility for the student throughout the school day (Appendix D, E, F, J).
6. Obtain materials and medical supplies necessary for diabetes care tasks from the parent/guardian and notify the student or parent/guardian when supplies need to be replenished (Appendix C & G).
7. Plan and implement diabetes training for trained school personnel/unlicensed assistive personnel (Appendix D & J).
8. Attend annual diabetes training.
9. Perform routine and emergency diabetes care tasks including documentation as necessary (see Appendix K)
10. Promote and encourage independence and self-care consistent with the student's ability, skill, maturity, and developmental level.
11. Act as liaison between the school and student's health care provider/team regarding the student's diabetes management at school with parental permission. Resources at each health care provider may differ, but you would expect the following resources to be available:
    a. Physicians, Nurse Practitioner and or Physician Assistant
    b. Nurse
    c. Dietitian
    d. Certified Diabetes Educator
    e. Social Worker
    f. Education Consultant
12. Communicate to parent/guardian concerns about the student's diabetes management or health.
13. Respect the student's confidentiality and right to privacy.
14. Act as an advocate for students to help them meet their diabetes health care needs and facilitate care to minimize the amount of class time missed.
15. Maintain current knowledge about federal, state, and local laws and regulations that pertain to managing diabetes at school.
16. Review the Nurse's Standard File for Students with Diabetes.

E. Teacher/School Staff Responsibilities

1. Meet with the parent/guardian, to gather information related to the child's diabetes.
2. Communicate with the school nurse regarding any concerns about the student.
3. Recognize that a change in the student's behavior could be a symptom of blood glucose changes; be prepared to respond to the signs and symptoms of hypoglycemia and hyperglycemia.
4. Provide support and allow the student to provide self-care anywhere, anytime if authorized by student's health care provider, parent/guardian and if the appropriate documentation (DMMP) is in place.
5. If a student displays symptoms of hypoglycemia, it would be preferred to provide treatment in the classroom and then notify school nurse. **Adult accompaniment is required if symptoms are present and child must leave the classroom for treatment.** Adult accompaniment is required if symptoms are present and a child

must leave the classroom for treatment. If possible, school nurse/clinic should be notified that student is coming to clinic.

6. Respect the student's confidentiality and right to privacy.
7. Provide a supportive environment for the student to manage diabetes effectively and safely at school, which may include:
   a. Eating snacks for routine diabetes management
   b. Having bathroom privileges and access to drinking water
   c. Monitoring blood glucose
   d. Administering insulin and other medications
8. Provide accommodations for the student with diabetes, as indicated in the student's IHP, 504 plan, IEP, or other education plan (Appendix -O).
9. Learn about diabetes from your school nurse.
10. Notify the parents/guardians and school nurse **in advance** of changes in school schedule, including class parties, field trips, and other special events.
11. Provide information for substitute teachers/nurses that communicate the needs of the student.

F. Principal Responsibilities

a. Understand federal and state laws that impact the provision of diabetes care at school.
b. Learn about diabetes and know who has diabetes in your building. Be able to recognize and respond to signs and symptoms of hypoglycemia and hyperglycemia.
c. Promote a supportive learning environment.
d. Work with school nurse or another designated health staff member to arrange for diabetes management training.
e. Ensure that trained diabetes personnel (designees are available during school hours as well as field trips, extracurricular activities, and other school-sponsored events.
f. Work with the school health team to coordinate and implement the student's health and educational plans as they relate to their diabetes. Understand and oversee implementation of needed health care and academic accommodations, educational aids and related services.

G. Food Services (manager, cafeteria works, monitors)

a. Learn about diabetes and how to identify the symptoms of hypoglycemia and hyperglycemia.
b. Obtain and follow the student's Quick Reference Emergency Plan from the school nurse.
c. Provide nutrition information and carbohydrate content for breakfast and lunch menus that include ala carte items.
d. Communicate with the school nurse and/or trained school personnel.

H. Bus Driver

1. Know which students on your bus have diabetes.
2. Learn how to recognize hypoglycemia and know who to contact for help.

3. Keep supplies to treat low blood glucose on the bus and be aware of where student normally keeps supplies.
4. Keep a copy and be familiar with the student's quick reference emergency plans.
5. Allow students with diabetes to eat snacks and drink beverages on the bus.

VIII. Virginia Diabetes Medical Management Plan Information

Pediatric Endocrinology practices from across the state of Virginia have collaborated to develop trial, evaluate and revise four forms for statewide use in assisting with the care of children with diabetes in the schools. These forms are intended to be used in conjunction with the Virginia Diabetes Medical Management Plan and Protocol and do not include instructions related to basic accommodations and care which is to be expected for any child with diabetes. A separate document has been created which makes these forms available for use by any school, or healthcare provider in the state of Virginia. The forms have been developed to be used as electronic forms which can be completed in Microsoft Word and then printed, scanned and/or saved; making them simple to archive and to alter when changes are required. A separate set of the forms has also been created for use in instances where computer access is limited or not feasible.

The majority of children will need Part 1, which is completed at school and Part 2, which is completed by their healthcare provider. Part 3 and Part 4 will only be used as necessary for those wearing insulin pumps and those who are competent & accountable for self-carry privileges. Individual providers are encouraged to customize the forms to include their contact information, phone numbers, etc. It is requested that the format remain consistent so that the purpose of standardizing completeness and placement of information can be kept in place.

The Virginia Diabetes Council has endorsed these forms and the Virginia Department of Education, School Health Division supports their use in all school systems in Virginia.

Part 1 Parent/Guardian includes Parent Authorizations for Trained School Designees

This form is distributed by the school nurse/clinic and is to be completed by the parent or guardian. The information in this form provides helpful information for completing the Individualized Health Plan. This form is required by the State of Virginia Board of Education as required by law to determine parent/guardian permission or denial of permission for administration of insulin and/or glucagon by trained unlicensed personnel. This form does not require any involvement from the healthcare provider's office.

Part 2 Physician Orders and Authorizations

Children with diabetes receiving care at most of the pediatric endocrinology healthcare providers' clinics/offices in Virginia have agreed to use the forms included in this document. They may complete the forms electronically, in writing or a combination of both. Parents/guardians should request or obtain these completed forms from their physician and are required to sign these forms to authorize communication between the healthcare provider's office and the school. School forms will not automatically be sent to the school without the parent/guardian's request. The forms should then be brought to the school by the child's parent/guardian. If another physician's office prefers to use his/her own *Diabetes Medical Management Plan* it must include all of the elements in this form. Copies of these forms may be shared electronically or by printing with any healthcare

provider or family. These materials can also be accessed at the Virginia Diabetes Council website www.virginiadiabetes.org. or the Virginia Department of Education's website http://www.doe.virginia.gov/VDOE/Instruction/Health/home.html. Forms may be individualized to a specific institution and may be adjusted to reflect practice patterns of specific providers. Please note that physician authorization for treatment by trained school designees must be included in the DMMP or a separate form must be provided. Healthcare providers are aware that children may be restricted from attending school if these forms are not provided to the school, but cannot be held responsible if the forms are not delivered to the school by the parent/guardian. Providers may make changes to these orders during the school year and are required to send only the applicable page requiring changes (the entire order set is not required). A new DMMP should be completed at the beginning of each school year.

Part 3 Plan Supplement for Student Wearing Insulin Pump

If the child wears an insulin pump, this supplemental form should be completed by the physician and parent/guardian. Portions of this form will be completed by the parent/guardian after the healthcare provider initiates the sections requiring orders. This form has been developed to help provide information regarding the child's proficiency in operating their insulin pump and to provide information on areas of operation where they will require assistance or supervision. Parents/guardians are required to provide adequate instruction, manuals and supplies to support pump therapy use in the school.

Part 4 Permission to Self-Carry

If a child is going to carry and self administer insulin and perform blood glucose checks in the classroom; an "Authorization to Carry and Self-Administer Medication Form" should be completed by the physician, school nurse and the parent/guardian. As explained on the form, the school has the option to revoke this privilege if adherence to school rules or guidelines is not demonstrated by the student.

IX. Appendices

A. Target Blood Glucose Goals by Age (ADA)

Table 15—*Plasma blood glucose and A1C goals for type 1 diabetes by age-group*

Values by age (years)	Plasma blood glucose goal range (mg/dl) Before Meals	Bedtime/ overnight	A1C	Rationale
Toddlers and preschoolers (0–6)	100–180	110–200	<8.5% (but >7.5%)	High risk and vulnerability to hypoglycemia
School age (6–12)	90–180	100–180	<8%	Risks of hypoglycemia and relatively low risk of complications prior to puberty
Adolescents and young adults (13–19)	90–130	90–150	<7.5%	● Risk of severe hypoglycemia ● Developmental and psychological issues ● A lower goal (<7.0%) is reasonable if it can be achieved without excessive hypo-glycemia

B. Examples of Accommodations to Consider for Students with Diabetes

Each student with diabetes has different needs, but education-related plans such as the Section 504 Plan or Individualized Education Program (IEP) are likely to include the following accommodations:

- Free access to water bottle and restroom
- Identity of trained diabetes personnel who are trained to conduct blood glucose checks, insulin and glucagon administration, and treatment of hypoglycemia and hyperglycemia
- Permission to eat snacks and meals at the same time each day, if applicable, and to eat snacks in the classroom
- Notification of parent/guardian, should there be any change in this routine
- Will have access to the school nurse or other trained school personnel
- Permission to leave the classroom, if desired, for diabetes related issues
- Will be accompanied when leaving the classroom, as needed
- Permission to provide self-care anywhere, anytime without adult supervision except to meet diabetes emergencies as authorized by health care team and parent/guardian
- Permission to have access to all diabetes related supplies
- Supervised by a staff member when administering insulin to verify that the correct dosage has been given, as needed
- Provide staff to determine and monitor amount of food consumed and to make sure that no food is shared with other children
- Full participation in physical education classes, field trips and other school-sponsored activities , with coverage provided by the school nurse or trained school personnel
- Alternative times for academic exams and completion of classroom assignments if experiencing hypoglycemia or hyperglycemia
- Permission for absences, without penalty, for doctors' appointments and diabetes-related illness

C. *Checklist for Parents*

Read "Parental Responsibilities" from this guide

- Read and discuss "Student with Diabetes Responsibilities" from this guide with student
- Have the student's family & healthcare provider complete the "Diabetes Medical Management Plan", Parts I, II, and if necessary Part III (Pump Management) and Part IV
- Discuss specific care of your child with the teachers, school nurse, bus driver, coaches and other staff who will be involved
- Provide input to the school nurse for the development of your child's Individualized Health Care Plan (IHP) with the help of the school staff and your diabetes care team. (Completed by the school nurse – not the parent)
- Make sure your child knows who will help him/her with blood glucose monitoring, insulin administration, and treatment of high or low blood glucose at school and where supplies will be kept. Supplies should be kept in a place where they are always available if needed
- Make arrangements for the school to send home blood glucose records weekly (or fax to MD office with parental permission), if desired
- Keep current phone numbers where you can be reached
- Provide equipment / supplies for school including the following:

  - Box with the child's name to store these items (you may need one for meds and one for food).
  - Medical Identification
  - Meter
  - Strips
  - Lancets & Device
  - Insulin
  - Syringes or pens & pen needles
  - Alcohol wipes
  - Glucagon Kit with instructions
  - Ketone testing strips
  - Sharps container
  - Log sheets for blood sugars
  - Pump supplies (See Supply List for Insulin Pumps)
  - Batteries for meter &/or pump
  - Food/Drinks for treating low blood glucose such as:
  - 15 gm CHO Juice cans or boxes
  - Glucose tabs
  - Instant glucose or cake decorating gel
  - Fruit-Roll Ups
  - Dried Fruit, raisins or other snacks
  - Crackers (± peanut butter and/or cheese

* Check regularly to make sure school has all necessary supplies (suggest monthly as minimum).

D. Checklist for School Nurse

School Nurse Checklist for Students with Diabetes

___ Contact parent/guardian

___ Have parent/guardian complete and sign Part 1 of DMMP

___ Obtain and review the remainder of the DMMP

___ Train staff

___ Obtain supplies

___ Develop IHP

___ Develop individual student file that may contain the following:

____ Current Diabetes Medical Management Plan

____ Current IHP, 504 and/or IEP

____ Permission to Self Carry, if applicable

____ Quick Reference Emergency Plan

____ Emergency Contact Information

____ Copy of Student's Schedule

____ Diabetes Treatment Log, if indicated

Other resources to have on hand in the clinic:

- Quick reference chart on hyper/hypoglycemia (to share with teachers, etc.)
- CHO Counting Reference Book
- Website for determining CHO content
- Information on CHO counts in cafeteria foods from Food Services
- Copy of menu for the month
- Pump Reference/Manual if applicable
- Continuous Glucose Monitor Manual
- Blood Glucose Meter Manual

E. Quick Reference Emergency Plan for Hypoglycemia

http://www.ndep.nih.gov/diabetes/pubs/Youth_NDEPSchoolGuide.pdf (pages 53-54)

Quick Reference Emergency Plan

for a Student with Diabetes

Hypoglycemia (Low Blood Sugar)

Photo

Student's Name

Grade/Teacher Date of Plan

Emergency Contact Information:

Mother/Guardian			**Father/Guardian**		
Home phone	Work phone	Cell	Home phone	Work phone	Cell

School Nurse/Trained Diabetes Personnel **Contact Number(s)**

Never send a child with suspected low blood sugar anywhere alone.

Causes of Hypoglycemia
- Too much insulin
- Missed food
- Delayed food
- Too much or too intense exercise
- Unscheduled exercise

Onset
- Sudden

Symptoms

Mild
- Hunger
- Shakiness
- Weakness
- Paleness
- Anxiety
- Irritability
- Dizziness
- Sweating
- Drowsiness
- Personality change
- Inability to concentrate
- Other: _____

Circle student's usual symptoms.

Moderate
- Headache
- Behavior change
- Poor coordination
- Blurry vision
- Weakness
- Slurred Speech
- Confusion
- Other _____

Circle student's usual symptoms.

Severe
- Loss of consciousness
- Seizure
- Inability to swallow

Circle student's usual symptoms.

Actions Needed

Notify School Nurse or Trained Diabetes Personnel. If possible, check blood sugar, per Diabetes Medical Management Plan. When in doubt, always TREAT FOR HYPOGLYCEMIA.

Mild
- Student may/may not treat self.
- Provide quick-sugar source.
  3-4 glucose tablets
  or
  4 oz. juice
  or
  6 oz. regular soda
  or
  3 teaspoons of glucose gel
- Wait 10 to 15 minutes.
- Recheck blood glucose.
- Repeat food if symptoms persist or blood glucose is less than _____.
- Follow with a snack of carbohydrate and protein (e.g., cheese and crackers).

Moderate
- Someone assists.
- Give student quick-sugar source per MILD guidelines.
- Wait 10 to 15 minutes.
- Recheck blood glucose.
- Repeat food if symptoms persist or blood glucose is less than _____.
- Follow with a snack of carbohydrate and protein (e.g., cheese and crackers).

Severe
- Don't attempt to give anything by mouth.
- Position on side, if possible.
- Contact school nurse or trained diabetes personnel.
- Administer glucagon, as prescribed.
- Call 911.
- Contact parents/guardian.
- Stay with student.

F. Quick Reference Emergency Plan for Hyperglycemia
http://www.ndep.nih.gov/diabetes/pubs/Youth_NDEPSchoolGuide.pdf (page 53-54).

Quick Reference Emergency Plan

for a Student with Diabetes

Hyperglycemia (High Blood Sugar)

Photo

Student's Name

Grade/Teacher Date of Plan

Emergency Contact Information:

Mother/Guardian			**Father/Guardian**		
Home phone	Work phone	Cell	Home phone	Work phone	Cell

School Nurse/Trained Diabetes Personnel

Contact Number(s)

Causes of Hyperglycemia
- Too much food
- Too little insulin
- Decreased activity
- Illness
- Infection
- Stress

Onset
- Over time—several hours or days

Symptoms

Mild
- Thirst
- Frequent urination
- Fatigue/sleepiness
- Increased hunger
- Blurred vision
- Weight loss
- Stomach pains
- Flushing of skin
- Lack of concentration
- Sweet, fruity breath
- Other: _____

Circle student's usual symptoms.

Moderate
- Mild symptoms plus:
- Dry mouth
- Nausea
- Stomach cramps
- Vomiting
- Other:_____

Circle student's usual symptoms.

Severe
- Mild and moderate symptoms plus:
- Labored breathing
- Very weak
- Confused
- Unconscious

Circle student's usual symptoms.

Actions Needed
- Allow free use of the bathroom.
- Encourage student to drink water or sugar-free drinks.
- Contact the school nurse or trained diabetes personnel to check urine or administer insulin, per student's Diabetes Medical Management Plan.
- If student is nauseous, vomiting, or lethargic, ____ call the parents/guardian or ____ call for medical assistance if parent cannot be reached.

G. Supply List for Insulin Pumps

Insulin Pump Supplies for School

_____ Blood glucose monitoring device, test strips, lancets

_____ Sharps Container

_____ Extra meter battery

_____ Extra pump battery

_____ Insulin and syringes

_____ Extra infusion sets, reservoirs/cartridges and insertion device (or extra Pods)

_____ Alcohol pads

_____ Dressing and tape or other adhesive

_____ Glucose tablets/instant glucose

_____ Glucagon emergency kit

_____ Ketone test strips

H. Continuous Glucose Monitors

Continuous Glucose Monitoring (CGM) In The School:
A continuous glucose monitor reads glucose levels from a sensor in the interstitial fluid (under the skin/subcutaneous). It usually reads within 15-20% of a finger stick blood glucose value. The monitor can be programmed to alert (vibrate or alarm audibly) for predetermined high and low glucose levels. CGM is meant to provide additional glucose information and does not take the place of finger stick blood glucose values. It is not FDA approved for use in making diabetes treatment decisions.

Always make sure that hands are clean and check blood glucose via finger stick before performing treatment.

Alert Settings
CGM will alarm if interstitial glucose is less than _____mg/dl or above _____ (this range will be individualized for each student). If CGM alarms for low or high blood glucose levels check finger stick blood glucose and treat according to the DMMP.

Arrows
Some continuous monitors show arrows on the screen to indicate the speed at which the glucose levels are changing. Arrows on the face of the monitor may point straight down, indicating a rapidly falling glucose level. Treatment should then be as in A. 2. below. The arrows may also point straight up, which means a rapid increase in glucose level. Treatment should be as in C below. A horizontal or 45 degree arrow (or one arrow in contrast to two arrows) may mean that the glucose level is not changing as rapidly.

When to Use CGM Information

A. Lows or Pending Lows

1. **CGM screen shows <70 mg/dl with or without arrow(s):**
   Check finger stick blood glucose and if low proceed with physician's care plan for treatment and food. Repeat blood glucose every 15 minutes until level is above 70 mg/dl.
2. **CGM Screen shows <100 mg/dl with downward arrow(s):**
   Check finger stick blood glucose. If blood glucose is between 70 and 100 mg/dl give 5-10 grams of carbohydrate (to prevent blood glucose from going lower). If <70 mg/dl proceed with DMMP for treatment and food as above.

B. Glucose Levels in Target Range

1. **CGM screen shows 80-200 mg/dl with or without arrow(s):**
   Check finger stick blood glucose as usual per DMMP or if symptomatic.

C. Highs or Pending Highs

1. **CGM screen shows >200 mg/dl with upward arrow(s) or >250 mg/dl:**
   Check finger stick blood glucose and follow physician's DMMP for treatment of high glucose including instructions for checking ketones, calling physician or parents and providing correction insulin.

I. Individualized Healthcare Plan

Below are suggested resources that can be used to develop an Individualized Health Care Plan (IHP). It is best practice to develop an IHP that includes specifics of care and addresses particulars that are not included in the DMMP, such as field trip accommodations, training of staff in diabetes, specific times to test blood glucoses, etc. It is a plan that should be provided to teachers and other staff members that are directly involved with the diabetic student.

- Arnold, Martha and Cynthia Silkworth: **The School Nurse's Source Book of Individualized Healthcare Plans,** Volume I & II, 1999.

- Brennan, Clara and Mary Clark: **Computerized Classroom Health Care Plans for School Nurses,** Fourth Edition, 2007.

J. Documentation of Communication

Documentation Checklist for Information Shared with Staff Members

Name of Student: **DOB:**

This form is to be completed whenever confidential health information regarding a student is shared with unlicensed personnel within the school system in order to provide necessary care or to insure safety.

Receiving Staff Name/Title (Print)	**Receiving Staff Signature**	**Information Provided**	**Information Provider Signature**	**Date**

K. Diabetes Treatment Log

DIABETES TREATMENT LOG

STUDENT: _____ SCHOOL: _____ GRADE: ____ TEACHER: _____ ROOM#: _____

PARENT/GUARDIAN TELEPHONE #: HOME: _____ WORK/CELL: _____

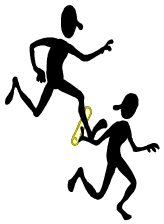
Target Glucose: _____

SIGNATURE/TITLE/INITIALS _____ SIGNATURE/TITLE/INITIALS _____

SIGNATURE/TITLE/INITIALS _____ SIGNATURE/TITLE/INITIALS _____

DATE	**TIME**	**SYMPTOMS**	**BLOOD GLUCOSE** (mg/dl)	**KETONES** (Negative, Trace, small, moderate or large)	**Carbs** (grams)	**INSULIN DOSE** (type & units)	**ACTION**	**INITIALS**

L. Carbohydrate Coverage for Physical Activity



General guidelines for extra food to cover exercise

Expected length of exercise	Blood glucose before exercise	Extra carbohydrate	Example of foods
Short (15-30 minutes) Examples: walking, stretching	Less than 80	15-20 grams	1 cup Gatorade *or* 1 cup milk *or* ½ cup juice
	80-150	15 grams	Small piece fresh fruit
	Greater than 150	None	None
Moderate (30-120 minutes) Examples: swimming, jogging, dancing, baseball	Less than 80	25-30 grams (include source of protein/fat)	1 cup Gatorade *or* 1 cup milk *or* ½ cup juice plus ½ sandwich
	80-150	25-30 grams (include source of protein/fat)	1 cup Gatorade *or* 1 cup milk *or* ½ cup juice plus small piece of fruit
	Greater than 150	15 grams (include source of protein /fat)	½ sandwich
Long (2 hours or more) Examples: football, basketball, soccer, hockey	Less than 80	30-40 grams initially, then 15 grams every hour (include source of protein/fat initially)	4-8 oz Gatorade plus whole sandwich then 8 oz Gatorade or 4 oz juice every hour
	80-150	20-30 grams initially, then 15 grams every hour (include source of protein/fat initially)	4-8 oz Gatorade plus ½ sandwich then 8 oz Gatorade or 4 oz juice every hour
	Greater than 150	15-20 grams initially then 15 grams every hour (include source of protein/fat initially)	Whole sandwich then 8 oz Gatorade every hour

Adapted from: Understanding Diabetes, 11th Edition

M. Virginia State Laws

Excerpts from Code of Virginia Pertaining to the Administration of Insulin and Glucagon in the School Setting

§ 8.01-225. Persons rendering emergency care, obstetrical services exempt from liability.

A. Any person who:

9. Is an employee of a school board, authorized by a prescriber and trained in the administration of insulin and glucagon, who, upon the written request of the parents as defined in § 22.1-1, assists with the administration of insulin or administers glucagon to a student diagnosed as having diabetes who requires insulin injections during the school day or for whom glucagon has been prescribed for the emergency treatment of hypoglycemia shall not be liable for any civil damages for ordinary negligence in acts or omissions resulting from the rendering of such treatment if the insulin is administered according to the child's medication schedule or such employee has reason to believe that the individual receiving the glucagon is suffering or is about to suffer life-threatening hypoglycemia. Whenever any employee of a school board is covered by the immunity granted herein, the school board employing him shall not be liable for any civil damages for ordinary negligence in acts or omissions resulting from the rendering of such insulin or glucagon treatment.

§ 22.1-274. School health services.

D. With the exception of school administrative personnel and persons employed by school boards who have the specific duty to deliver health-related services, no licensed instructional employee, instructional aide, or clerical employee shall be disciplined, placed on probation or dismissed on the basis of such employee's refusal to (i) perform non-emergency health-related services for students or (ii) obtain training in the administration of insulin and glucagon. However, instructional aides and clerical employees may not refuse to dispense oral medications.

For the purposes of this subsection, "health-related services" means those activities which, when performed in a health care facility, must be delivered by or under the supervision of a licensed or certified professional.

E. Each school board shall ensure that, in school buildings with an instructional and administrative staff of ten or more, (i) at least two employees have current certification in cardiopulmonary resuscitation or have received training, within the last two years, in emergency first aid and cardiopulmonary resuscitation and (ii) if one or more students diagnosed as having diabetes attend such school, at least two employees have been trained in the administration of insulin and glucagon. In school buildings with an instructional and administrative staff of fewer than ten, school boards shall ensure that (i) at least one employee has current certification in cardiopulmonary resuscitation or has received training, within the last two years, in emergency first aid and cardiopulmonary resuscitation and (ii) if one or more students diagnosed as having diabetes attend such school, at least one employee has been trained in the administration of insulin and glucagon. "Employee" shall include any person employed by a local health

department who is assigned to the public school pursuant to an agreement between the local health department and the school board. When a registered nurse, nurse practitioner, physician or physician assistant is present, no employee who is not a registered nurse, nurse practitioner, physician or physician assistant shall assist with the administration of insulin or administer glucagon. Prescriber authorization and parental consent shall be obtained for any employee who is not a registered nurse, nurse practitioner, physician or physician assistant to assist with the administration of insulin and administer glucagon.

§ 22.1-275.1. School health advisory board.

Each school board shall establish a school health advisory board of no more than twenty members which shall consist of broad-based community representation including, but not limited to, parents, students, health professionals, educators, and others. The school health advisory board shall assist with the development of health policy in the school division and the evaluation of the status of school health, health education, the school environment, and health services.

The school health advisory board shall hold meetings at least semi-annually and shall annually report on the status and needs of student health in the school division to any relevant school, the school board, the Virginia Department of Health, and the Virginia Department of Education.

The local school board may request that the school health advisory board recommend to the local school board procedures relating to children with acute or chronic illnesses or conditions, including, but not limited to, appropriate emergency procedures for any life-threatening conditions and designation of school personnel to implement the appropriate emergency procedures. The procedures relating to children with acute or chronic illnesses or conditions shall be developed with due consideration of the size and staffing of the schools within the jurisdiction.

§ 54.1-2901. Exceptions and exemptions generally.

A. The provisions of this chapter shall not prevent or prohibit:

13. Any person from the rendering of first aid or medical assistance in an emergency in the absence of a person licensed to practice medicine or osteopathy under the provisions of this chapter;

20. Any person from rendering emergency care pursuant to the provisions of § 8.01-225;

26. Any employee of a school board, authorized by a prescriber and trained in the administration of insulin and glucagon, when, upon the authorization of a prescriber and the written request of the parents as defined in § 22.1-1, assisting with the administration of insulin or administrating glucagon to a student diagnosed as having diabetes and who requires insulin injections during the school day or for whom glucagon has been prescribed for the emergency treatment of hypoglycemia;

§ 54.1-3001. Exemptions.

This chapter shall not apply to the following:

9. Any employee of a school board, authorized by a prescriber and trained in the administration of insulin and glucagon, when, upon the authorization of a prescriber and the written request of the parents as defined in § 22.1-1, assisting with the administration of insulin or administrating glucagon to a student diagnosed as having diabetes and who requires insulin injections during the school day or for whom glucagon has been prescribed for the emergency treatment of hypoglycemia;

§ 54.1-3005. Specific powers and duties of Board of Nursing.

In addition to the general powers and duties conferred in this title, the Board shall have the following specific powers and duties:

13. To develop and revise as may be necessary, in coordination with the Boards of Medicine and Education, guidelines for the training of employees of a school board in the administration of insulin and glucagon for the purpose of assisting with routine insulin injections and providing emergency treatment for life-threatening hypoglycemia. The first set of such guidelines shall be finalized by September 1, 1999, and shall be made available to local school boards for a fee not to exceed the costs of publication;

§ 54.1-3408. Professional use by practitioners.

H. Pursuant to a written order or standing protocol issued by the prescriber within the course of his professional practice, such prescriber may authorize, with the consent of the parents as defined in § 22.1-1, an employee of a school board who is trained in the administration of insulin and glucagon to assist with the administration of insulin or administer glucagon to a student diagnosed as having diabetes and who requires insulin injections during the school day or for whom glucagon has been prescribed for the emergency treatment of hypoglycemia. Such authorization shall only be effective when a licensed nurse, nurse practitioner, physician or physician assistant is not present to perform the administration of the medication.

M. In addition, this section shall not prevent the administration of drugs by a person who administers such drugs in accordance with a physician's instructions pertaining to dosage, frequency, and manner of administration and with written authorization of a parent, and in accordance with school board regulations relating to training, security and record keeping, when the drugs administered would be normally self-administered by a student of a Virginia public school. Training for such persons shall be accomplished through a program approved by the local school boards, in consultation with the local departments of health.

N. VIRGINIA BOARD OF NURSING GUIDANCE DOCUMENT # 90-36

VIRGINIA BOARD OF NURSING

GUIDANCE DOCUMENT # 90-36

TITLE: Guidelines for Training of Public School Employees in the Administration of Insulin and Glucagon

Authorization: Code of Virginia. Chapter- 570 of the 1999 Acts of the Assembly, An Act to amend and reenact § 22.1-274, 22.1-275.1, 54.1-2901, 54.1-3001, 54.1-3005, and 54.1-3408 of the Code of Virginia relating to care of public school students diagnosed with diabetes. See copy of Chapter 570 attached.

Training Guidelines

I. Parameters of Training

A. Qualifications of instructional personnel. The trainer must be:

1. A registered nurse or licensed physician with recent training or experience in the management of diabetes mellitus in children.

2. Trained in relevant sections of law and regulations, such as Individuals with Disabilities Educational Act (IDEA) and Occupational Safety and Health Act

(OSHA).

B. The course shall continue until competency is demonstrated, but shall not be less than four hours.

C. Retraining shall be completed at least yearly and last not less than one hour.

D. Training shall be documented and shall include skills checklist, instructor's name, trainee's name, date of training, and documentation of competency of trainee to administer.

II. Content of the Training Curriculum

A. The need to have authorization for treatment initially received and updated annually from the following:

1. The student parent or guardian.

2. The treating physician, who may further authorize the parent or guardian to alter dosages as necessary.

B. The requirements for an individualized health care plan for each student to be initially prepared and updated annually.

C. Rights and responsibilities of the student, the physician, the parent or guardian, tile administrator, and the trainee which are consistent with existing laws and policies of the local school board and with relevant state and federal laws to include, but not be limited to the following:

1. Individuals with Disabilities Educational Act (IDEA)
2. Section 504 of the Rehabilitation Act
3. Occupational Safety and Health Act (OSHA); and.
4. The Drug Control Act (Chapter 34 of Title 54.1 of the Code of Virginia)

D. Overview of diabetes mellitus
1. Definition
2. Types of diabetes

E. Principles of medication administration
1. Right student
2. Right medication
3. Right dose
4. Right route
5. Right time

F. Therapeutic management of diabetes
1. Nutrition
2. Exercise
3. Medication
4. Support of independence
a. Support the student's developing independence through assisting with self- care.
b. Support the student's healthy response to diabetes.

G. Monitoring of student
1. Using insulin pump
2. Testing blood glucose
3. Testing of urine

H. Insulin administration
I. Proper storage of drug
2. Administration only from a properly labeled prescription vial from a pharmacy
3. Essential techniques of administration

I. Hyperglycemia

1. Prevention

2. Recognition

3. Treatment

J. Hypoglycemia

1. Prevention

2. Recognition

3. Treatment, including administration of glucagon.

K. Storage and disposal of medical supplies

1. Standard precautions

2. Security of medication and syringes

3. Expiration date of medication

L. Necessity for documentation to be maintained and to include:

1. Signed authorizations, updated annually, from the student's parent or guardian and from the physician.

2. The individualized healthcare plan, updated annually, for each student.

3. Medication administration that is signed and consistent with required procedures.

4. Description of any complications.

M. Emergency plan

N. Existing resources in community, such as organizations and written materials adopted: July 20, 1999 (Virginia Board of Nursing)

July, 1999 (Virginia Board of Medicine)

July 22, 1999 (Virginia Board of Education)

Reviewed: November 18, 2003

O. Sample 504 Plan

American Diabetes Association®
Cure • Care • Commitment®

DREDF Advocating for disability civil rights since 1979
DISABILITY RIGHTS EDUCATION & DEFENSE FUND

MODEL 504 PLAN FOR A STUDENT WITH DIABETES

[NOTE: This model 504 Plan lists a broad range of services and accommodations that might be needed by a child with diabetes in school. The plan should be individualized to meet the needs, abilities, and medical condition of each student and should *include only those items in the model that are relevant to that student*. Some students will need additional services and accommodations that have not been included in this model plan.]

Section 504 Plan for _____

School _____

School Year: _____

_____	_____	_____	type __ diabetes
Student's Name	Birth Date	Grade	Disability

Homeroom Teacher: _____ Bus Number: _____

OBJECTIVES/GOALS OF THIS PLAN

Diabetes can cause blood glucose (sugar) levels to be too high or too low, both of which affect the student's ability to learn as well as seriously endangering the student's health both immediately and in the long term. The goal of this plan is to provide the special education and/or related aids and services needed to maintain blood glucose within this student's target range, and to respond appropriately to levels outside of this range in accordance with the instructions provided by the student's personal health care team.

REFERENCES

- School accommodations, diabetes care, and other services set out by this Plan will be consistent with the information and protocols contained in the National Diabetes Education Program *Helping the Student with Diabetes Succeed: A Guide for School Personnel*, June 2003.

DEFINITIONS USED IN THIS PLAN

1. ***Diabetes Medical Management Plan (DMMP)*:** A plan that describes the diabetes care regimen and identifies the health care needs of a student with diabetes. This plan is developed and approved by the student's personal health care team and family. Schools must do outreach to the parents and child's health care provider if a DMMP is not submitted by the family **[Note: School districts may have other names for the plan. If so, substitute the appropriate terminology throughout.]**

2. ***Quick Reference Emergency Plan:*** A plan that provides school personnel with essential information on how to recognize and treat hypoglycemia and hyperglycemia.

3. ***Trained Diabetes Personnel (TDP)*:** Non-medical school personnel who have been identified by the school nurse, school administrator, and parent who are willing to be trained in basic diabetes knowledge and have received training coordinated by the school nurse in diabetes care, including the performance of blood glucose monitoring, insulin and glucagon administration, recognition and treatment of hypoglycemia and hyperglycemia, and performance of ketone checks, and who will perform these diabetes care tasks in the absence of a school nurse.

1. PROVISION OF DIABETES CARE

1.1 At least _____ staff members will receive training to be Trained Diabetes Personnel (TDP), and either a school nurse or TDP will be available at the site where the student is **at all times** during school hours, during extracurricular activities, and on school sponsored field trips to provide diabetes care in accordance with this Plan and as directed in the DMMP, including performing or overseeing administration of insulin or other diabetes medications (which, for pump users includes programming and troubleshooting the student's insulin pump), blood glucose monitoring, ketone checks, and responding to hyperglycemia and hypoglycemia including administering glucagon.

1.2 Any staff member who is not a TDP and who has primary care for the student at any time during school hours, extracurricular activities, or during field trips shall receive training that will include a general overview of diabetes and typical health care needs of a student with diabetes, recognition of high and low blood glucose levels, and how and when to immediately contact either a school nurse or a TDP.

1.3 Any bus driver who transports the student must be informed of symptoms of high or low blood glucose levels and provided with a copy the student's Quick Reference Emergency Plan and be prepared to act in accordance with that Plan.

2. TRAINED DIABETES PERSONNEL

The following school staff members will be trained to become TDPs by _____(date):

_____

_____

3. STUDENT'S LEVEL OF SELF-CARE AND LOCATION OF SUPPLIES AND EQUIPMENT

3.1 As stated in the attached DMMP:

(a)The student is able to perform the following diabetes care tasks without help or supervision:

_____

_____

_____

and the student will be permitted to provide this self-care at any time and in any location at the school, at field trips, at sites of extracurricular activities, and on school buses.

(b) The student needs assistance or supervision with the following diabetes health care tasks:

_____

_____

_____

(c) The student needs a school nurse or TDP to perform the following diabetes care tasks:

_____

_____

_____

3.2 The student will be permitted to carry the following diabetes supplies and equipment with him/her at all times and in all locations:

_____

_____

3.3 Diabetes supplies and equipment that are not kept on the student and additional supplies and will be kept at:

_____

3.4 Parent is responsible for providing diabetes supplies and food to meet the needs of the student as prescribed in the DMMP.

4. SNACKS AND MEALS

4.1 The school nurse or TDP, if school nurse is not available, will work with the student and his/her parents/guardians to coordinate a meal and snack schedule in accordance with the

attached DMMP that will coincide with the schedule of classmates to the closest extent possible. The student shall eat lunch at the same time each day, or earlier if experiencing hypoglycemia. The student shall have enough time to finish lunch. A snack and quick-acting source of glucose must always be immediately available to the student.

4.2 The attached DMMP sets out the regular time(s) for snacks, what constitutes a snack, and when the student should have additional snacks. The student will be permitted to eat a snack no matter where the student is.

4.3 The parent/guardian will supply snacks needed in addition to or instead of any snacks supplied to all students.

4.4 The parent/guardian will provide carbohydrate content information for snacks and meals brought from home.

4.5 The school nurse or TDP will ensure that the student takes snacks and meals at the specified time(s) each day.

4.6 Adjustments to snack and meal times will be permitted in response to changes in schedule upon request of parent/guardian.

5. EXERCISE AND PHYSICAL ACTIVITY

5.1 The student shall be permitted to participate fully in physical education classes and team sports except as set out in the student's DMMP.

5.2 Physical education instructors and sports coaches must have a copy of the emergency action plan and be able to recognize and assist with the treatment of low blood glucose levels.

5.3 Responsible school staff members will make sure that the student's blood glucose meter, a quick-acting source of glucose, and water is always available at the site of physical education class and team sports practices and games.

6. WATER AND BATHROOM ACCESS

6.1 The student shall be permitted to have immediate access to water by keeping a water bottle in the student's possession and at the student's desk, and by permitting the student to use the drinking fountain without restriction.

6.2 The student shall be permitted to use the bathroom without restriction.

7. CHECKING BLOOD GLUCOSE LEVELS, INSULIN AND MEDICATION ADMININSTRATION, AND TREATING HIGH OR LOW BLOOD GLUCOSE LEVELS

7.1 The student's level of self care is set out in section 3 above including which tasks the student can do by himself/herself and which must be done with the assistance of, or wholly by, either a school nurse or a TDP.

7.2 Blood glucose monitoring will be done at the times designated in the student's DMMP, whenever the student feels her/his blood glucose level may be high or low, or when symptoms of high or low blood glucose levels are observed.

7.3 Insulin and/or other diabetes medication will be administered at the times and through the means (e.g., syringe, pen or pump) designated in the student's DMMP for both scheduled doses and doses needed to correct for high blood glucose levels.

7.4 The student shall be provided with privacy for blood glucose monitoring and insulin administration if the student desires.

7.5 The student's usual symptoms of high and low blood glucose levels and how to respond to these levels are set out in the attached DMMP.

7.6 When the student asks for assistance or any staff member believes the student is showing signs of high or low blood glucose levels, the staff member will immediately seek assistance from the school nurse or TDP while making sure an adult stays with the student at all times. Never send a student with actual -- or suspected -- high or low blood glucose levels anywhere alone.

7.7 Any staff member who finds the student unconscious will immediately contact the school office. The office will immediately do the following in the order listed:

1. Contact the school nurse or a TDP (if the school nurse is not on site and immediately available) who will confirm the blood glucose level with a monitor and immediately administer glucagon (glucagon should be administered if no monitor is available);

2. Call 911 (office staff will do this without waiting for the school nurse or TDP to administer glucagon); and

3. Contact the student's parent/guardian and physician at the emergency numbers provided below.

7.8 School staff including physical education instructors and coaches will provide a safe location for the storage of the student's insulin pump if the student chooses not to wear it during physical activity or any other activity.

8. FIELD TRIPS AND EXTRACURRICULAR ACTIVITIES

8.1 The student will be permitted to participate in all school-sponsored field trips and extracurricular activities (such as sports, clubs, and enrichment programs) without restriction and with all of the accommodations and modifications, including necessary supervision by identified school personnel, set out in this Plan. The student's parent/guardian will not be required to accompany the student on field trips or any other school activity.

8.2 The school nurse or TDP will be available on site at all school-sponsored field trips and extracurricular activities, will provide all usual aspects of diabetes care (including, but not limited to, blood glucose monitoring, responding to hyperglycemia and hypoglycemia, providing snacks and access to water and the bathroom, and administering insulin and glucagon), and will make sure that the student's diabetes supplies travel with the student.

9. TESTS AND CLASSROOM WORK

9.1 If the student is affected by high or low blood glucose levels at the time of regular testing, the student will be permitted to take the test at another time without penalty.

9.2 If the student needs to take breaks to use the water fountain or bathroom, check blood glucose, or to treat hypoglycemia or hyperglycemia during a test or other activity, the student will be given extra time to finish the test or other activity without penalty.

9.3 The student shall be given instruction to help him/her make up any classroom instruction missed due to diabetes care without penalty.

9.4 The student shall not be penalized for absences required for medical appointments and/or for illness. The parent will provide documentation from the treating health care professional if otherwise required by school policy.

10. COMMUNICATION

10.1 The school nurse, TDP, and other staff will keep the student's diabetes confidential, except to the extent that the student decides to openly communicate about it with others.

10.2 Encouragement is essential. The student be treated in a way that encourages the student to eat snacks on time, and to progress toward self-care with his/her diabetes management skills.

10.3 The teacher, school nurse or TDP will provide reasonable notice to parent/guardian when there will be a change in planned activities such as exercise, playground time, field trips, parties, or lunch schedule, so that the lunch, snack plan, and insulin dosage can be adjusted accordingly.

10.4 Each substitute teacher and substitute school nurse will be provided with written instructions regarding the student's diabetes care and a list of all school nurses and TDP at the school.

11. EMERGENCY EVACUATION AND SHELTER-IN-PLACE

11.1 In the event of emergency evacuation or shelter-in-place situation, the student's 504 Plan and DMMP will remain in full force and effect.

11.2 The school nurse or TDP will provide diabetes care to the student as outlined by this Plan and the student's DMMP, will be responsible for transporting the student's diabetes supplies, and equipment, will attempt to establish contact with the student's parents/guardians and provide updates, and will and receive information from parents/guardians regarding the student's diabetes care.

13. PARENTAL NOTIFICATION

13.1 ***NOTIFY PARENTS/GUARDIANS IMMEDIATELY IN THE FOLLOWING SITUATIONS:***

- Symptoms of severe low blood sugar such as continuous crying, extreme tiredness, seizure, or loss of consciousness.
- The student's blood glucose test results are below _____ or are below _____15 minutes after consuming juice or glucose tablets.
- Symptoms of severe high blood sugar such as frequent urination, presence of ketones, vomiting or blood glucose level above _____.
- The student refuses to eat or take insulin injection or bolus.
- Any injury.
- Insulin pump malfunctions cannot be remedied.
- Other: _____

  _____

13.2 **EMERGENCY CONTACT INSTRUCTIONS**

Call parent/guardian at numbers listed below. If unable to reach parent/guardian, call the other emergency contacts or student's health care providers listed below.

EMERGENCY CONTACTS:

_____	_____	_____	_____
Parent's/Guardian's Name	Home Phone Number	Work Phone Number	Cell Phone Number

_____	_____	_____	_____
Parent's/Guardian's Name	Home Phone Number	Work Phone Number	Cell Phone Number

Other emergency contacts:

_____	_____	_____	_____
Name	Home Phone Number	Work Phone Number	Cell Phone Number

_____	_____	_____	_____
Name	Home Phone Number	Work Phone Number	Cell Phone Number

Student's Health Care Provider(s):

_____	_____
Name	Phone Number

_____	_____
Name	Phone Number

This Plan shall be reviewed and amended at the beginning of each school year or more often if necessary.

Approved and received:

_____	_____
Parent/Guardian	Date

Approved and received:

_____	_____
School Administrator and Title	Date

_____	_____
School Nurse	Date

X. References and Resources

American Academy of Pediatrics – medication administration position statement
http://aappolicy.aappublications.org/cgi/content/full/pediatrics;112/3/697?fulltext=school+medication&searchid=QID_NOT_SET

American Association of Diabetes Educators – Management of Children with Diabetes in the School Setting Position Statement
http://www.diabeteseducator.org/export/sites/aade/_resources/pdf/PositionStatement_xChildren.Diabetesx_2008.pdf

American Diabetes Association, Clinical Practice Recommendations, 2009. Position Statement: Diabetes Care in the School and Day Care Setting.
http://care.diabetesjournals.org/content/32/Supplement_1/S68.full.pdf+html
www.diabetes.org; 1-800-DIABETES

American Diabetes Association Safe at School **"Diabetes Care Tasks at School: What Key Personnel Need to Know School Training Modules, 2008**". PowerPoint Modules may be accessed by going to http://www.diabetes.org/advocacy-and-legalresources/discrimination/school/schooltraining.jsp

American Medical Association – School Policy Statement
http://www.ama-assn.org/ama/no-index/about-ama/18642.shtml

Betschart, Jean: **It's Time to Learn About Diabetes**. A Workbook on Diabetes for Children. 1995.

Brennan, Clara and Mary Clark: **Computerized Classroom Health Care Plans for School Nurses,** Fourth Edition, 2007.

Calorie King, www.calorieking.com

Chase, Peter: **A First Book for Understanding Diabetes,** Companion to the 11th Edition of "Understanding Diabetes". Children's Diabetes Foundation, 2007.*

Chase, Peter: **Understanding Diabetes**, 11th Edition. Children's Diabetes Foundation, 2006.*

Chase, Peter: **Understanding Insulin Pumps & Continuous Glucose Monitors,** First Edition, Children's Diabetes Foundation, 2007.*

Children's Diabetes Foundation at Denver: www.childrensdiabetesfdn.com

Children with Diabetes: www.childrenwithdiabetes.com
Types of Insulin - www.childrenwithdiabetes.com/d_0n_110.htm
Insulin Pens and Cartridges - www.childrenwithdiabetes.com/d_06_390.htm

Eli Lilly Glucagon Training DVD "Be Prepared"
http://www.humalog.com/include/glucagon_video.jsp

Gosselin, Kim, **Taking Diabetes to School**: 3rd Edition 1998.

Helping the Student with Diabetes Succeed: A Guide for School Personnel. A Joint program of the National Institutes of Health and the Centers for Disease Control and Prevention, the National Diabetes Education program, American Diabetes Association, June 2003. www.ndep.nih.gov

Hendel, Elisa**: A Child in Your Care Has Diabetes:** A collection of Information, 3rd Edition.

Juvenile Diabetes Research Foundation International, School Advisory Toolkit for Families, 2008. http://www.jdrf.org/index.cfm?fuseaction=home.viewPage&page_id=B0D6F669-1321-C844-13D72F4759F3826F

Manual for Training Public School Employees In the Administration of Insulin and Glucagon, September 1999, Virginia Department of Education, division of Instruction, Office of Special Education and Student Services.

National Association of School Nurses: HANDS and diabetes care position statement. www.nasn.org

Partners for Success: School Nurses and the Care of Children with Diabetes at School. School of Public Health, State University of New York at Albany. DVD available from the American Diabetes Association.

Parent-Teacher Association – school diabetes care resolution http://www.pta.org/2018.htm

Successful Pumping in the School. Animas Corporation 2007-2008. May be accessed by going to http://www.animascorp.com/nursetraining/

*These references can be accessed online in view only format at: www.barbaradaviscenter.org (click on Online Books & Teaching Slides).

XI Glossary

A

Acanthosis nigricans (A-can-tho-sis NIG-reh-cans). A physical sign of insulin resistance in which the skin around the neck, armpits, or groin looks dark, thick, and velvety. This is often mistaken for poor hygiene.

Americans with Disabilities Act. A federal law enacted in 1990 to protect people with disabilities from discrimination. Under this law, diabetes can be considered a disability.

Autoimmune disease. A disorder in which the immune system mistakenly attacks and destroys body tissue that it believes to be foreign. In type 1 diabetes, an autoimmune disease, the immune system attacks and destroys the insulin-producing beta cells in the pancreas.

B

Basal insulin (Basal Profile). Also known as background insulin that is absorbed slowly and gives the body a steady low level of insulin to manage blood glucose levels between meals. It also describes the low level steady background release of insulin by the insulin pump.

Blood glucose level. The amount of glucose in the blood. The recommended blood glucose levels for most people with diabetes are from about 90 to 130 before a meal and 90-150 at bedtime.

Blood glucose meter. A device that measures how much glucose is in the blood. A fresh sample of blood (obtained by pricking the skin, usually the finger, with a lancet) is placed on a specially coated test strip, that is read by the meter. The meter calculates and displays the blood glucose result.

Blood ketone test. The blood ketone test is done with a finger stick test using a special meter and strip, similar to blood glucose monitoring with a blood glucose meter.

Bolus insulin dose. The amount of insulin delivered at one time, usually before a meal to match the amount of carbohydrate to be eaten and/or when blood glucose is high or above the prescribed target. A bolus may be given by syringe or via an insulin pump. Some insulin pumps are capable of giving a customized bolus in several different ways (terminology will differ depending on the pump manufacturer):

C

Carbohydrates (carb, CHO). One of the three main classes of foods and a source of energy for the body. Carbohydrates are mainly sugars and starches that the body breaks down into glucose. Foods high in carbohydrates raise blood glucose levels. Carbohydrate foods include: breads, crackers, and cereals; pasta, rice, and grains; vegetables; milk and yogurt; fruit, juice, and sweetened sodas; and table sugar, honey, syrup, and molasses.

Celiac Disease. A medical condition that requires dietary restrictions of any food products that contain gluten. Gluten is found in many grains, including wheat, rye, and barley, which are found in many pastas, cereals, and processed foods.

Carb ratio. The number of grams of carbohydrates that 1 unit of insulin covers for an individual. This is individualized and determined by the student's personal diabetes health care team.

Changing Carb Intake. This method requires adjusting insulin doses to cover the amount of carbs consumed using an insulin-to-carb ratio. Students who use multiple daily injections or an insulin pump usually use this method of meal planning. See insulin to carb ratio.

Consistent Carb Meal Plan. Students who follow a consistent carb meal plan aim for a set amount of carb grams at each meal and snack and do not adjust their mealtime insulin for the amount of carb intake. It is important to maintain consistency in the timing and content of meals and snacks.
Continuous glucose monitoring system (CGMS). The CGMS works through a sensor inserted under the skin that measures blood glucose levels at regular intervals and sends the current glucose level to a monitor that is carried or worn by the student in a pocket, a backpack, or a purse. The CGMS sets off an alarm when 5/19/2009glucose levels are too high or too low. The CSMS is not a replacement for blood glucose monitoring with a blood glucose meter. It is a useful tool for identifying trends and can enhance the ability of the student's personal diabetes health care team to make needed adjustments to the student's diabetes care regimen.
Correction factor (Insulin sensitivity). The glucose correction factor is the amount of insulin the student needs to lower blood glucose to target level. This is individualized and determined by the student's personal diabetes health care team.
Combo bolus feature see dual wave.

D
Diabetes Medical Management Plan. Describes the medical orders or diabetes regimen developed by the student's health care provider and family for a student with diabetes. Schools must do outreach to the parents and child's health care provider if a DMMP is not submitted by the family
Diabetic Coma. A severe emergency in which a person is not conscious because his or her blood glucose is too low or too high. See also hyperglycemia; hypoglycemia; and diabetic ketoacidosis.
Diabetic ketoacidosis (DKA). A condition that occurs due to insufficient insulin in the body. This can be due to illness, incorrect doses of insulin, or omitting insulin injections. The acidic state that follows causes fruity smelling breath, deep and rapid breathing, stomach pain, nausea, vomiting, and sleepiness. DKA can lead to coma and death if not treated promptly.
Dual wave / combination bolus. combines a "normal bolus" with a square wave/extended bolus. Some of the insulin will be delivered immediately, and some will be programmed to be delivered over a period of 30 minutes to several hours. This feature is helpful when eating foods that are absorbed quickly along with other foods that take longer to absorb (such as a fruit salad and pizza). Example: 2.0 units delivered now and 3 units delivered over 3 hours.
Duration. Duration is the number of hours insulin continues to lower blood glucose levels.

E
Exercise / PE CHO ratio. The number of grams of carbohydrates that 1 unit of insulin covers for an individual prior to exercise. Many individuals are more sensitive to their insulin when it is taken prior to exercise (i.e. require less insulin). A child who participates in PE immediately following their lunch period may need less insulin to cover their lunch carbohydrate and prevent hypoglycemia during or after exercise. This approach is sometimes used instead of providing additional carbohydrate prior to PE and is preferred to discourage overeating/intake of excessive calories for some children. This is particularly important when PE does not occur everyday or the student has an alternating class schedule. This ratio may also be used for field trips when increased activity is anticipated.
Extended bolus/ Square wave. Allows you to evenly spread a bolus dose over a specified time period (usually 30 minutes to several hours). It is used whenever the food being eaten will not

be absorbed in a short period of time. This delayed absorption may occur when eating foods high in fat or protein. Absorption can also be delayed when eating over a longer period of time, such as at a banquet or multi-course dinner. Example: a 5.0 unit bolus could be delivered evenly over 3 hours.

F

Fast-acting glucose. Foods containing simple sugar that are used to raise blood glucose levels quickly during a hypoglycemic episode. (ie:15 gm carbohydrate juice cans or boxes, Glucose tabs, Instant glucose or cake decorating gel, Fruit-Roll Ups, Dried Fruit, raisins or other snacks)
504 Plan. A plan of services developed under Section 504 of the Rehabilitation Act and is developed by the 504 team that may include the school nurse, 504/IEP coordinator/school administrator, teacher, guidance counselor, and parent/guardian.

G

Glucagon. A hormone that raises the level of glucose in the blood. Glucagon, given by injection, is used to treat severe hypoglycemia.
Glucagon Emergency Kit. The kit contains a glucagon and a special glucagon syringe filled with a diluent. This should be replaced yearly and requires a prescription.
Glucose. A simple sugar found in the blood. It is the body's main source of energy.
Glucose tablets or gel. Special products that deliver a pre-measured amount of pure glucose. They are a fast-acting form of glucose used to counteract hypoglycemia.
Glucose lowering medications. Oral medications that lower blood glucose levels, usually used with type 2 diabetes.

H

Hyperglycemia. A high level of glucose in the blood. High blood glucose can be due to a mismatch in insulin, food, and exercise. Symptoms include thirst, frequent urination, blurred vision, and fatigue.
Hypoglycemia. A low level of glucose in the blood. Low blood glucose is most likely to occur during or after exercise, if too much insulin is present, or not enough food is consumed. Symptoms include feeling shaky, having a headache, or being sweaty, pale, hungry, or tired.

I

Individualized Education Program (IEP). A program designed for students covered by the Individuals with Disabilities Education Act (IDEA).
Individuals with Disabilities Education Act (IDEA). A federal law that provides funds to states to support special education and related services for children with disabilities, administered by the Office of Special Education Programs in the U.S. Department of Education. To be eligible for services under IDEA, a student's diabetes must impair his or her educational performance so that he or she requires special education and related services.
Individualized Health Care Plan. A plan developed by the school nurse used to implement the student's diabetes medical management plan. The plan describes functional problem areas, sets goals for overcoming problems, and lists tasks/interventions to meet the goals.
Infusion set. The hub, catheter and insertion set used to transfer insulin from the insulin pump through an infusion line. The catheter is inserted under the skin and taped in place. See insulin pump.

Insulin. A hormone produced by the pancreas that helps the body use glucose for growth and energy. There are several types of insulin that are used in combination to treat people with diabetes. These different types of insulin have been manufactured either to have immediate (rapid-acting or short-acting insulin), intermediate, or long (basal insulin) onset of action and duration of action in the body. A coordinated combination of insulins is used to allow for adequate treatment of diabetes at meals, snacks, during periods of physical activity, and through the night. See rapid acting, intermediate, and long acting insulin.
Insulin to Carb Ratio (Carb ratio). The insulin-to-carb ratio is the number of units of insulin needed to cover the number of grams of carb in the food the student plans to eat. This is individualized and determined by the student's personal diabetes health care team.
Insulin injections. The process of putting insulin into the body with a needle and syringe or an insulin pen.
Insulin pen. An insulin pen holds a cartridge of insulin. A needle is screwed onto its tip just before use. The user dials the pen to the prescribed dose and injects the insulin.
Insulin pump. A device that delivers a continuous supply of insulin. The insulin is delivered in a steady, measured dose through a system of plastic tubing (infusion set). Most infusion sets are started with a guide needle, then the plastic cannula (a tiny, flexible plastic tube - cannula) is left in place, taped with dressing, and the needle is removed.
The first type of pump looks like a pager and usually is worn on the student's waistband or belt. The pump holds a reservoir of insulin that is attached to an infusion set. The cannula usually is changed every 2 or 3 days or when blood glucose levels remain above the target range or ketones are present.
The second type of pump, the pod or patch**,** is attached directly to the skin and a guide needle inserts the cannula under the skin automatically. The pod contains the insulin and there is no tubing. The pod type pump is controlled by a small hand-held computer device that is kept nearby.
Insulin resistance. A condition in which the body does not respond normally to the action of insulin. Many people with type 2 diabetes have insulin resistance.
Insulin sensitivity. Is the measurement of how efficiently your body uses insulin. Using formulas health care professionals can estimate how many mg/dl one unit of insulin will drop blood glucose levels. This is used to calculate the correction factor.
Intermediate acting insulin. An intermediate acting insulin is NPH, it has an onset of action starting about 2 hours following injection. It has a peak effect 4-12 hours after injection, and duration of action of 18-26 hours. See Insulin

K
Ketoacidosis. See Diabetic ketoacidosis.
Ketones (ketone bodies). Ketones are chemicals that the body makes when there is not enough insulin in the blood and the body must break down fat for energy. The ketones may result from untreated high blood glucose, but also can occur when a student is ill. At first, ketones will be cleared by the kidneys into the urine, but if more ketones are produced than the kidneys can handle, they will build up in the blood and may result in diabetic ketoacidosis (DKA), a condition that may lead to a medical emergency.
Ketone Test. The blood ketone test is done with a finger stick test using a special meter and strip, similar to blood glucose monitoring with a blood glucose meter or by testing of urine**.** The urine

ketone test involves dipping a special strip into the urine and comparing the resulting color to a color chart.

L

Lancet. A fine, sharp-pointed needle used by people with diabetes for pricking their skin to obtain a sample of blood for blood glucose monitoring.
Lancing Device. The device has adjustable controls allowing the smallest prick possible to obtain a sample of blood for blood glucose monitoring.
Long acting Insulin. (Lantus and Levemir) Is used as the background insulin that is absorbed slowly and gives the body a steady low level of insulin to manage blood glucose levels between meals.

M

Medical alert identification. An identification card and necklace or bracelet indicating the student has diabetes and giving an emergency number to call.
Mg/dL. Milligrams per deciliter. This term is used in blood glucose monitoring to describe how much glucose is in a specific amount of blood.

O

Onset of insulin. Onset is the length of time before insulin reaches the bloodstream and begins lowering
blood glucose levels. See also Insulin.

P

Pallor. Abnormal paleness of the skin.
Palpitations. Abnormally rapid or violent beating of the heart.
Pancreas. The organ behind the lower part of the stomach that makes insulin.
Peak effect time. Time at which insulin is at its maximum strength in terms of lowering blood glucose levels. See also Insulin.
Pre-meal. Refers to the time before a meal.

Q

Quick Reference Emergency Plan. This plan provides school personnel with essential information on how to recognize and treat hypoglycemia or hyperglycemia.

R

Rapid Acting Insulin Novolog, Humalog, Aprida begin to work within 15 minutes of administration peaks at 1-2 hours and may last for 3- 4 hours. These insulins are used in insulin pumps.
Reservoir. The container that stores the fast acting insulin in a pump.

S

Section 504 of the Rehabilitation Act. A federal law that prohibits recipients of federal funds from discriminating against people on the basis of disability.
Sharps Container.

Short Acting Insulin. Regular Insulin onset of action is 30-60 minutes, peak at 2-3 hours and duration of 3-6 hours
Square wave/ Extended bolus/ Allows you to evenly spread a bolus dose over a specified time period (usually 30 minutes to several hours). It is used whenever the food being eaten will not be absorbed in a short period of time. This delayed absorption may occur when eating foods high in fat or protein. Absorption can also be delayed when eating over a longer period of time, such as at a banquet or multi-course dinner. Example: a 5.0 unit bolus could be delivered evenly over 3 hours.
Syringe. A device used to inject medications such as insulin into body tissue.
Self-Carry. A student is allowed to carry and self administer insulin and perform blood glucose checks in the classroom if permitted and adheres to school rules and guidelines. Self-Management. A person with diabetes becomes responsible for all aspects of self-care, including blood glucose monitoring and insulin administration.

T
Target range. A selected level for blood glucose values that the person with diabetes tries to maintain. The target range is usually determined by the physician in consultation with the patient (or parents, if the patient is a child). See also blood glucose levels.
Test strips. Specially designed strips used in blood glucose meters or in urine testing of ketones.
Trained Diabetes Personnel (TDP). Non-medical school personnel who have been identified by the school nurse, school administrator, and parent who are willing to be trained in basic diabetes knowledge and have received training coordinated by the school nurse in diabetes care, including the performance of blood glucose monitoring, insulin and glucagon administration, recognition and treatment of hypoglycemia and hyperglycemia, and performance of ketone checks, and who will perform these diabetes care tasks in the absence of a school nurse.

U
Unit. The measure in which insulin is prescribed.
Urine ketone testing. The urine ketone test involves dipping a special strip into the urine and comparing the resulting color to a color chart. See ketones.