Manual for Training Public School Employees

in the

Administration of Insulin and Glucagon

Office of Student Services
Division of Special Education and Student Services
Virginia Department of Education
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Edited by:
Suzanne Renegar, MSN, RN
For the Virginia Department of Education

Tia Campbell, MSN, RN, NCSN
School Health Specialist
Virginia Department of Education

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Frances Gray, MSN, RN
School Nurse Coordinator
Portsmouth City Public School

Deborah Gleason, MSN, RN, CPNP
Bon Secours Virginia
Crossridge Pediatrics and Internal Medicine

Sandy VanDyke, RN, CPNP
School Nurse Coordinator
Tazewell County Public Schools

Linda Pearce
Diabetes Educator, Retired

Suzanne Renegar, MSN, RN
Public Health Nurse Supervisor
Roanoke City/ Alleghany
Health District

Kathy Miller, ARNP, PhD
Clinical Faculty
Division of Pediatric Endocrinology,
Metabolism and Diabetes
Georgetown University

Michele Holskey, DNP, RN, CDE
Magnet Program Director/
Nursing Project Manager
Carilion Clinic

Katie Conschafter, MS, RD, LDN, CDE
Senior Clinical Manager, Mid-South
Animas Corporation

Kathy Whitby, MSN, RN
School Nurse Coordinator
Stafford County Schools

Tia Campbell, MSN, RN, NCSN
School Health Specialist
Virginia Department of Education

Cathy Sturgeon, BSN, RN
School Nurse Coordinator, Retired
Loudoun County Schools

Gwen Smith, MSN, RN
School Health Specialist, Retired
Virginia Department of Education

Mary Claire Ikenberry, MS, RN
Clinical Coordinator IV
Ambulatory Care

Crystal Jackson
Associate Director, Legal Advocacy
American Diabetes Association

VCU Sports Medicine Center

National Office

Debbie Sauve King, MSN, RN, CNS, CDE
Program Coordinator
Carilion Clinic
Diabetes Management Program

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INTRODUCTION

One of the most common chronic diseases of childhood is diabetes. According to 2010 statistics from the National Institutes of Health (NIH) (2011), "about 215,000 people younger than 20 years had diabetes – type 1 or type 2 – in the United States." During the years 2002-2005, the NIH noted that "15,600 youth were newly diagnosed with type 1 diabetes annually, and 3,600 youth were newly diagnosed with type 2 diabetes annually." The American Diabetes Association (ADA) stated in their position statement, *Diabetes Care in the School and Day Care Setting*, "The majority of these young people attend school and/or some type of day care and need knowledgeable staff to provide a safe school environment" (2011a). The ADA advocates for parents and the health care team to collaborate with school personnel to allow children with diabetes to participate fully and safely in the school experience.

In 1999, the Virginia General Assembly passed legislation, *Code of Virginia (COV)* § 22.1-274. E, to ensure that trained personnel are in each public school where students diagnosed with diabetes are present. As directed by the Virginia General Assembly, guidelines were adopted by the Virginia Board of Nursing (VBON) on July 20, 1999, accepted by the Virginia Board of Medicine in July 1999, and adopted by the Virginia Board of Education in July 1999 (1999) (Appendix A). This manual is a revision of the 1999 document.

The purpose of this manual is to provide the registered nurse or licensed physician with the tools to equip school personnel to confidently and safely provide care to the student with diabetes, in the absence of professional health care providers in the school. This manual provides a blueprint of information that must be included in training programs for school staff, resources for further information, and sample documents. Basic information regarding diabetes, a glossary (Appendix B), diabetes management in school, guidance in selecting appropriate training personnel, setting up the training session, and diabetes resources for teachers and parents are included. This manual provides the trainer with a comprehensive teaching tool. The overarching goal of the training program is to provide students with a safe school environment where they can fully participate in the school experience.

The school nurse has multiple functions in the care of the student with diabetes. The role of the school nurse includes:

- case management;
- direct care;
- development of the Individualized Health Care Plan (IHP)
- training and supervision of unlicensed staff administering insulin and/or glucagon; and
- evaluation of care provided to the student.

According to the National Association of School Nurses, "An Individualized Health Plan (IHP) developed by the school nurse documents and communicates the student's needs and the school's management strategies for that student in the school setting." (2006) The school nurse develops the IHP based upon the Diabetes Medical Management Plan (DMMP), input from the parent, and a nursing assessment.

BACKGROUND

The 1999 Virginia General Assembly passed legislation that amended and reenacted the *COV* with respect to the management of diabetes in the school setting. The following references outline the provisions in the *COV*.

- *COV* § 8.01-225(A)(9) – Persons rendering emergency care exempt from liability;
- *COV* § 22.1-274(D) – Ability of school board employees to refuse training in the administration of insulin and glucagon;
- *COV* § 22.1-274(E) - Ensures 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;
- *COV* § 22.1-275.1 – Outlines participation of school health advisory boards in developing procedures relating to children with acute or chronic conditions;
- *COV* § 54.1-2901(A)(13)(20)(26) - Allows employees 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;
- *COV* § 54.1-3001(9) – Exemptions;
- *COV* § 54.1-3005(13) - Requires 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.

Specific code references may be accessed online, utilizing the Virginia General Assembly Legislative Information System at: http://leg1.state.va.us/lis.htm.

The approved guidelines provide a framework for local school divisions to implement the policy established in the *COV*. In order to ensure that local school divisions are adequately prepared to administer insulin and glucagon, and to provide continuity in training school personnel, the Virginia Board of Education directed the Office of Special Education and Student Services to develop a manual to accompany the approved guidelines.

Manual for Training Public School Employees in the Administration of Insulin and Glucagon

Authorization

The *Code of Virginia* establishes the legal basis for providing diabetes training for unlicensed personnel in the school setting.

Code of Virginia. Chapter 570 of the 1999 Acts of the Assembly, An Act to amend and reenact §§ 8.01-225, 22.1-274, 22.1-275.1, 54.1-2904, 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**.** Excerpts of Chapter 570 may be found in Appendix C.

I. Parameters of Training

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

1. A registered nurse (RN) or licensed physician with training or experience within the past two years in the management of diabetes in children and adolescence**.**

2. Trained in relevant sections of laws and regulations, such as Individuals with Disabilities Education Act (IDEA); Rehabilitation Act of 1973, Section 504; and Occupational Safety and Health Act (OSHA).

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

C. Skills shall be maintained with an annual training session lasting no less than one hour or until competency is demonstrated.

D. Training shall be documented and shall include the instructor's name, trainee's name, date of training, a skills checklist, and documentation of competency of the trainee to administer insulin and/or glucagon. Samples of forms for training skills checklists and other appropriate documentation are included in Appendix D.

E. All training materials will be updated annually.

II. Content of the Training Curriculum

The content of the training curriculum has been organized into modules. Each module covers required training components as outlined by the Boards of Education, Nursing, and Medicine in 1999. Medical management of diabetes has changed dramatically since the original training

guidelines were issued. The scope of the training material has expanded to reflect current practice. The modules contained in this program include:

A. Rights and Responsibilities
B. Overview of Diabetes
C. Authorization for Treatment
D. Principles of Medication Administration
E. Individualized Healthcare Plan
F. Therapeutic Management of Diabetes
G. Monitoring the Student with Diabetes
H. Insulin Administration
I. Hyperglycemia
J. Hypoglycemia
K. Storage and Disposal of Medical Supplies
L. Documentation
M. Emergency Plans
N. Resources and References

MODULE A: RIGHTS AND RESPONSIBILITIES

The rights and responsibilities of the student, physician, parent or guardian, administrator, and the trainee shall be consistent with relevant state and federal laws and local school board policy.

Federal laws that may apply to children with diabetes include the Rehabilitation Act of 1973, Section 504; Title II of the Americans with Disabilities Act (ADA) of 1990; the Individuals with Disabilities Education Act (IDEA) of 1990, amended 1997 and 2004; and federal regulations 34 C.F.R. 300.7 (9)(i), Child with a Disability.

State laws include Chapters 30 and 34 of the *Code of Virginia*. (Appendix C)

1. Individuals with Disabilities Educational Act (IDEA);

The United States Congress, in 1975, passed Public Law 94-142, The Education for All Handicapped Children Act. This legislation is now referred to as Individuals with Disabilities Education Act or IDEA. It is an educational bill of rights for children ages 5 to 18 years of age. The basic rights guaranteed to students with disabilities include the following:

- A free appropriate education for all children.
- An education in the least restrictive environment based on the child's needs.
- An assessment of needs that is racially and culturally unbiased and is given in the child's native language or mode of communication.
- An individualized education program (IEP) prepared by a team of professionals that includes parents.
- Due process and a procedure for complaints to ensure the rights of the individual.

In 1986, 1990, 1991, 1997, and 2004, Public Law 94-142 was amended: however, the basic rights of children with disabilities did not change. These rights continue to provide protection against discrimination for children with disabilities, including those with diabetes.

IDEA Regulations define "disability." The definition includes a category for chronic or acute health problems that limit the individual's "alertness with respect to the educational environment" (U.S. Department of Education, n.d.). This category is called "other health impairment" (OHI). Diabetes, as well as other health conditions such as asthma and epilepsy, is included in the examples. IDEA information may be accessed online at: http://idea.ed.gov/explore/view/p/%2Croot%2Cregs%2C300%2CA%2C300%252E8%2C

2. Section 504 of the Rehabilitation Act of 1973:

Section 504 of the Rehabilitation Act of 1973 protects individuals with disabilities against discrimination because of their disability, in any program or activity receiving federal financial assistance, including public schools (U. S. Department of Education, 2010). Students with disabilities have the right to "a free and appropriate public education" (FAPE), regardless of the nature or severity of the person's disability. FAPE includes the provision of educational services to the disabled student as adequately as the nondisabled students' needs are met. This protection includes the right to the opportunity to participate fully in school activities: academic, nonacademic, and extracurricular.

In order to provide for the needs of a student with disabilities while at school, parents and school officials may develop a Section 504 Plan. In the case of a student whose disability is diabetes, a Section 504 Plan would outline the diabetes care and/or assistance the student needs in order to access the program of learning. Samples of accommodations might include such things as providing for the administration of insulin or glucagon, allowing the student free access to food or drink, or assisting the student with blood glucose checks. Information on Section 504 may be accessed online at: http://www2.ed.gov/about/offices/list/ocr/docs/edlite-FAPE504.html

School districts may have their own form for developing a Section 504 Plan. The American Diabetes Association webpage has a sample Section 504 Plan available online at: http://www.diabetes.org/living-with-diabetes/parents-and-kids/diabetes-care-at-school/written-care-plans/section-504-plan.html

3. The Americans with Disabilities Act

The Americans with Disabilities Act, Title II "requires that State and local governments give people with disabilities an equal opportunity to benefit from all of their programs, services, and activities (e.g. public education, employment, transportation, recreation, health care, social services, courts, voting, and town meetings) (U. S. Department of Justice, 2005). This law prohibits all schools, except those run by religious institutions, from discriminating against students with disabilities.

This law states that all students should have equal opportunity to participate in school sponsored activities, including field trips and after school events. It states that public schools should make reasonable accommodations for a student with diabetes. Accommodations are to be specified in the education plan and services may include:

- Assuring that there are staff members trained in checking blood glucose levels, recognizing and treating hypoglycemia and hyperglycemia, and administering insulin and/or glucagon

- Allowing students to monitor blood glucose levels in the classroom and other locations and to treat hypoglycemia and hyperglycemia promptly

- Providing appropriate supervision to ensure student participation in sports, extra-

curricular activities, and field trips

- Accessing restroom facilities and drinking water as needed

- Permitting absences for medical appointments and extra sick days when necessary

More information on the Americans with Disabilities Act may be accessed online at: http://www.ada.gov/regs2010/titleII_2010/titleII_2010_regulations.htm

4. Occupational Safety and Health Administration (OSHA)

The OSHA/VOSH 1910.1030 Bloodborne Pathogens Standard final rule was issued in December 1991 to reduce the occupational transmission of infections caused by microorganisms sometimes found in human blood and certain other potentially infectious materials. As of 1992, a Bloodborne Pathogens Standard Exposure Control Plan is required in all Virginia schools. Following OSHA requirements, an Exposure Plan provides specific guidance on the management of sharps and other items contaminated with blood and body fluids. Exposure Plans shall be reviewed and updated at least annually and whenever necessary (U. S. Department of Labor, 2008). Some additional OSHA requirements include:

Sharps

- Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed.

- Shearing or breaking of contaminated needles is prohibited.

- Sharps containers must be closable, puncture resistant, labeled, or colored-coded, leak proof on sides and bottom, and remain upright throughout use.

Sharps containers

- Sharps containers must be easily accessible to personnel and located as close as possible to the immediate area where sharps are used.

Personal protective equipment

- Disposable gloves (latex or vinyl) shall be worn when performing a procedure where there is a reasonable expectation that the employee may have contact with blood or other potentially infectious material. Single use gloves are replaced as soon as practical after coming in contact with blood or infectious material or, as soon as possible, if torn or the ability to act as a barrier is compromised.

Additional information OSHA standards for Bloodborne pathogens may be found at:

Occupational Safety and Health Administration: Part Number 1910: Occupational Safety and Health Standards: Bloodborne pathogens: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051

5. Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g; 34 CFR Part 99)

Federal legislation protects the privacy of student educational records with legislation commonly referred to as FERPA (U. S. Department of Education, 2011). The law applies to all schools which receive funds under an applicable program of the U.S. Department of Education.

FERPA gives parents, and eligible students (those 18 years of age), certain rights with respect to their children's education records.

Parents or eligible students have the right to inspect and review the student's education records maintained by the school. They have the right to request that a school correct records which they believe to be inaccurate or misleading.

Generally, schools must have written permission from the parent or eligible student in order to release any information from a student's education record. However, FERPA allows schools to disclose those records, without consent, to the following parties or under the following conditions (U. S. Department of Education, 2011):

- school officials with legitimate educational interest;
- other schools to which a student is transferring;
- specified officials for audit or evaluation purposes;
- appropriate parties in connection with financial aid to a student;
- organizations conducting certain studies for or on behalf of the school;
- accrediting organizations;
- to comply with a judicial order or lawfully issued subpoena;
- appropriate officials in cases of health and safety emergencies; and
- state and local authorities, within a juvenile justice system, pursuant to specific state law.

Additional information on FERPA may be accessed online at:
http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html

6. The Drug Control Act (Chapter 34 of Title 54.1 of the *Code of Virginia*)

To provide for the training of public school staff in the administration of insulin and glucagon, The Virginia General Assembly amended The Drug Control Act of the *Code of Virginia (COV)* (1999) as follows:

> 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 and 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.

7. The Code of Virginia Pertaining to Nursing

Chapter 30 of the *COV* regulates the practice of nursing in the Commonwealth. *COV* § 54.1-3000 states that a "professional nurse" means a registered nurse whose practice is defined as follows:

> "Professional nursing," "registered nursing" or "registered professional nursing" means the performance for compensation of any nursing acts in the observation, care and counsel of individuals or groups who are ill, injured or experiencing changes in normal health processes or the maintenance of health; in the prevention of illness or disease; in the supervision and teaching of those who are or will be involved in nursing care; in the delegation of selected nursing tasks and procedures to appropriately trained unlicensed persons as determined by the Board; or in the administration of medications and treatments as prescribed by any person authorized by law to prescribe such medications and treatment. Professional nursing, registered nursing and registered professional nursing require specialized education, judgment, and skill based upon knowledge and application of principles from the biological, physical, social, behavioral and nursing sciences.

The following section defines exceptions to Chapter 30 of Title 54.1-3408 of the *Code of Virginia* (Nursing). The Exceptions include a provision for school staff to receive training in the administration of insulin and glucagon:

> *COV* § 54.1-3001. Exceptions:
>
> 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;

8. *Code of Virginia § 22.1-274(E) School health services.*

Virginia law includes provisions for school health services. Included in the *COV* is a requirement for schools to provide trained staff for the care of students with diabetes:

> 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.

9. Levels of Training

In Virginia, the *COV* sets requirements for the minimum number of staff to receive training when a student with diabetes attends the school. In addition, the National Diabetes Education Program (NDEP) (2010, p. 3) makes the following training recommendations to ensure effective diabetes management in the school setting:

Level 1. All school personnel should receive training that provides a basic understanding of diabetes, how to recognize and respond to the signs and symptoms of low blood glucose (hypoglycemia) and high blood glucose (hyperglycemia), and who to contact immediately in case of 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 additional training to carry out their individual roles and responsibilities and to know what to do in case of a diabetic emergency.

Level 3. One or more school staff members should receive in-depth training about diabetes and routine and emergency care for each student with diabetes from a diabetes-trained health care professional such as the school nurse or a certified diabetes educator. 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 or checking their blood glucose).

10. Responsibilities for Collaboration

In order to feel safe, maintain wellness, and progress educationally, students with diabetes depend upon the collaboration of their family, their health care team, and their school health team. The NDEP (2010, pp. 65-96) has developed a set of "Actions" sheets

that outline the responsibilities and roles that the student, parents, and school staff play in carrying out a student's DMMP. Everyone has a part to play in helping the student reach his or her potential and access the educational environment. No role is insignificant.

MODULE B: OVERVIEW OF DIABETES

The National Institutes of Health's National Diabetes Information Clearinghouse (2008) defines diabetes as a "disorder of metabolism." When people eat, much of the food is broken down into glucose, the form of sugar in the blood. Glucose is the main source of energy for the body. As digestion occurs, the glucose moves into the blood, which transports it to the cells of the body where it is used for energy.

In order for glucose to move from the blood into the cells, there must be insulin present. Insulin is a hormone made by the pancreas and usually secreted in response to increased blood glucose levels. In people who have diabetes, the body makes little or no insulin or the body does not use insulin properly. Because the body is not using the glucose, high levels of glucose build up in the blood, spill into the urine, and then are passed out of the body. Even though the body has high levels of glucose in the blood, the body lacks the ability to utilize it and so the body's main source of fuel is lost.

If the body no longer makes insulin, an alternate source of insulin must be provided by either injections or from an insulin pump. If the body does not use insulin properly, individuals may take insulin and/or other glucose lowering medications. Insulin and other diabetes medications are used to manage blood glucose levels; they do not provide a cure for the disease.

"Diabetes must be managed 24 hours a day, 7 days a week," (The National Diabetes Education Program, 2010, p. 1). Managing diabetes is a constant quest to achieve the right balance between food intake, physical activity, and insulin amounts in order to keep blood sugar levels in the target range. Factors such as exercise, illness, and stress, make it difficult to always maintain that perfect balance. When the balance is tipped, the student experiences symptoms of blood sugars that are too high or too low. Blood sugars that are too high or too low are serious and require proper recognition and action by trained adults to help keep students healthy.

The American Diabetes Association's (ADA) *Position Statement: Standards of Medical Care* (2011b) provides a summary of diabetes management tools and goals, including blood glucose levels, suitable for use by most individuals. It is important to remember that the medical management of diabetes should be individualized to the needs of the person. Healthcare providers may vary target ranges for blood sugars taking into account the benefits and the risks, the frequency of low blood sugars, and the individual's ability to recognize a low (p. 38). The ADA recommends the following target blood glucose ranges before meals:

Values by age	Blood Glucose (mg/dL)
Toddlers and preschoolers (0-6 years)	100 - 180
School age (6-12 years)	90 - 180
Adolescents and young adults (13-19 years)	90 - 130

Taking care of diabetes is important. If not treated, diabetes can lead to serious health problems. The disease can affect the blood vessels, eyes, kidneys, nerves, gums, and teeth, and it is the leading cause of adult blindness, non-traumatic lower limb amputations, and kidney failure.

People with diabetes also have a higher risk of heart disease and stroke. Research shows that these problems can be greatly reduced or delayed by keeping blood glucose levels near normal (Southall, 2004, p. 19)

The management of diabetes is rapidly changing. Technological advances provide more options for individualized care. Diabetes management requires an individual approach; it requires a careful balance of a variety of factors including the student's age and developmental level. Additional factors include exercise and sports, diet, medication management, and blood glucose monitoring. It is necessary to consider all these factors when preparing the student's individualized health care plan and in planning for the least restrictive educational environment.

Types of Diabetes

A. Type 1

Type 1 diabetes mellitus (T1DM) is a complex metabolic disease. In people with T1DM, 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 T1DM need to take insulin and/or oral medications on a daily basis to live. T1DM can occur at any age, but it begins most often in children and young adults. Currently, there is no cure for T1DM, but research into prevention and treatment is ongoing.

Symptoms

- increased thirst
- increased urination
- constant hunger
- weight loss
- blurred vision
- fatigue

Risk Factors

- genetics
- environment

B. Type 2

The first step in the development of type 2 diabetes mellitus (T2DM) is often a problem with the body's response to insulin, or insulin resistance. For reasons scientists do not completely understand, the body cannot use its insulin very well. This means that the body needs increasing amounts of insulin to control blood glucose. The pancreas tries to make more insulin, but after several years, insulin production may drop off. Children with T2DM may need to take oral medication, insulin, or both.

T2DM is a disease found mainly in overweight adults ages 40 or older. With the epidemic of childhood obesity and low levels of physical activity in today's youth, more children and

adolescents are being diagnosed with T2DM (Centers for Disease Control, 2010). A healthy diet, adequate exercise, and weight management may decrease the risk of getting T2DM.

Symptoms

- fatigue
- increased thirst
- increased urination
- nausea
- rapid weight loss
- blurred vision
- frequent infections
- slow healing of wounds or sores

Risk Factors

- being overweight (greater than 85th percentile for height/weight)
- having a family member who has type 2 diabetes or a mother who had gestational diabetes
- African American, Hispanic/Latino, Native American, Asian, or Pacific Islander Ethnicity (Specialized Health Care Procedures 2004, pp. 19-20)

C. Gestational Diabetes

It should be noted that signs of diabetes that first occur during pregnancy may be an indication of gestational diabetes. This type of diabetes occurs during pregnancy and typically subsides after delivery. According to the NDEP, women who have experienced diabetes during pregnancy may be more likely to develop T2DM later in life and the child from that pregnancy has an increased risk of developing obesity and T2DM (2010, p. 14).

MODULE C: AUTHORIZATION FOR TREATMENT

Authorization for treatment at school must be received prior to care being provided. The Diabetes Medical Management Plan (DMMP) and Medication Permission forms are available at the student's school. Forms may vary by school division. Physicians may also provide their own form(s) for diabetes management.

The Virginia Diabetes Council supports the use of a statewide DMMP, developed by a diverse group of stakeholders including school nurses and pediatric endocrinologists (Virginia Diabetes Council, 2010). The Virginia DMMP and accompanying protocol are available online at: http://www.virginiadiabetes.org/resources.html

The NDEP (2010, pp. 99-106) also has a sample DMMP. This form is available online at: http://ndep.nih.gov/publications/PublicationDetail.aspx?PubId=97&redirect=true%23main#main

Authorization must be updated each school year by the following:

1. The student's parent or guardian needs to give permission for the student to be treated at school, following the DMMP.
    a. Per *COV* § 22.1-274.E, The parent and prescribing health care provider must give written permission for unlicensed, trained school personnel to administer insulin and/or glucagon in the absence of a licensed health care provider at school.

2. The treating health care provider must provide written authorization for insulin and/or glucagon to be given at school and procedures for treating diabetes. This information is contained in the DMMP.

3. Local school board policy may require additional forms for treating students with chronic health conditions.

4. RNs and LPNs may only administer medications and treatments prescribed by persons authorized by law to prescribe such medications and treatments (*COV* § 54.1-3000). School nurses may consult the parent for a specific medication dose if the prescribing health care provider has provided a written dosage range.

MODULE D: PRINCIPLES OF MEDICATION ADMINISTRATION

Each local school division should have its own school board policy for the administration of medication in school.

The *COV* § 22.1-274.D (1999) specifies that certain employees may decline to provide health-related services without fear of disciplinary action:

> 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 health care professional.

The state laws and regulations that govern the legal practice of nursing in Virginia are commonly known as the Virginia Nurse Practice Act. These laws must be followed when developing local school board policy for the administration of medication at school by a RN or licensed practical nurse (LPN). The Virginia Nurse Practice Act does not permit RNs to delegate the administration of medication. Therefore, if medication administration is to be performed by personnel who do not hold appropriate health care licensure, the building administrator must designate who will perform this task in the absence of the nurse.

The following chart helps to clarify those who may and may not refuse to provide health-related services:

SCHOOL STAFF ASSISTANCE WITH STUDENT HEALTH NEEDS

Personnel	**Glucagon, Insulin and Blood Sugar Administration and Assistance**	**Oral Medications**	**Non-Emergency Procedures and Treatments****
Instructional Aides	**May refuse**	**May not refuse**	**May refuse**
Clerical	**May refuse**	**May not refuse**	**May refuse**
Instructional Staff	**May refuse**	**May refuse**	**May refuse**
Administrators	**May not refuse**	**May not refuse**	**May not refuse**
Persons Hired to render Care*	**May not refuse**	**May not refuse**	**May not refuse**

*Aside from the designated nursing staff, “persons hired to render care” also includes persons such as classroom assistants and “one-on-one” personal assistants.

**Non-emergency type procedures and treatments (health-related services for students), such as, but not limited to, simple dressing changes, nebulizer treatments, uncomplicated catheterizations, and helping with uncomplicated gastric tube feedings.

(Chart used with permission of the School Health Coordinator, Office of School Health Services, Virginia Beach City Public Schools).

1. Medication authorization

Authorization for medication administration should follow school division policy.
The written authorization should include the following information:

- student's name
- licensed prescriber's name, telephone number, and signature
- date prescription written
- name of the medication
- dosage to be administered
- route of administration
- time of day to be given
- frequency of administration and whether it can be repeated
- anticipated length of treatment
- diagnosis or reason the medication is needed (unless reason should remain confidential)
- potential side effects of the medication
- serious reactions that may occur if the medication is not administered
- special handling instructions

Any change in the original medication authorization requires a new written authorization and a corresponding change in the prescription label. Medication orders or changes in medication orders should never be accepted from parents or others who are not licensed to prescribe in Virginia. Faxed authorizations may be acceptable as long as there is a signed parental consent for the medication authorized by fax.

In an emergency or under urgent circumstances, medication orders may be taken over the phone. Telephone changes should be taken directly from the licensed prescriber by a licensed nurse only, if this is consistent with the local school division policy. The telephone authorization for changes in medications should be recorded on the student's record and be a one-time-order only. A telephone authorization should be followed by a written order from the licensed prescriber within 24 hours. Prior consultation with the parent is optimal. If orders are received due to a health care emergency, the parent should be notified as soon as possible.

Medication authorization should be received on a standardized medication administration form. School divisions may have their own form for this purpose, available at the school and/or on the division's website. The Virginia Departments of Health and Education also have sample, standardized forms available for use, as referenced below. However, authorization on stationary or the licensed prescriber's prescription pad is acceptable when accompanied by a signed parental consent form.

The Virginia Department of Health's *School Health Guidelines* has a sample form (1999, p. 261) that is accessible online at:
http://www.doe.virginia.gov/support/health_medical/virginia_school_health_guidelines/general_guidelines_admin-meds.pdf

The Virginia Department of Education also has sample forms in the *Manual for the Training of Public School Employees in the Administration of Medication* (2006, pp. 122-125) accessible online at:
http://www.doe.virginia.gov/support/health_medical/medication/manual_training_admin-meds.pdf

2. Medication administration

Since most children spend the majority of their waking hours in school, it is important that designated staff receive training to perform selected health care tasks that the children cannot do for themselves. One of these tasks is the administration of medication. Designees taking the training to administer insulin and glucagon should receive instruction in the basic principles of medication administration as well as in the administration of medications related to diabetes care.

The VDOE has a manual to assist school divisions in providing medication administration training to designated staff (Virginia Department of Education, 2006). It is entitled, *Manual for the Training of Public School Employees in the Administration of Medication.* The original authorization, as developed and approved by the Virginia Boards of Nursing, Medicine and Education, for school staff to receive training in the administration of insulin and glucagon included the basic principles of medication administration as one of the required training components. The "five rights of administering medication" are listed as an important safety precaution when administrating medications. The "five rights" of giving medication are:

- Right student
- Right medication
- Right dose
- Right time
- Right route (by mouth, injection, etc.)

According to the *COV* § 22.1-274. 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.

Citing the *COV* § 22.1-274, The *Manual for the Training of Public School Employees in the Administration of Medication* (Virginia Department of Education, 2006, p. 35) states:

- If a registered nurse, nurse practitioner, physician, or physician assistant is present, no other school employee may administer insulin or glucagon.
- The Virginia Nurse Practice Act does not permit registered nurses to delegate the administration of medication. Therefore, the building administrator must designate which staff members, who do not hold an appropriate health care license, will receive training and administer medication in the nurse's absence.
- **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.**
- The school nurse should provide ongoing training and feedback to school staff administering medications in his or her absence.
- The medication label should be reviewed by the school nurse, principal, or principal's designee prior to giving the first dose. (An exception would be the administration of medication in the insulin pump.)

The *Manual for the Training of Public School Employees in the Administration of Medication* (2006, pp. 35-39) further recommends the principal or school nurse should ensure that:

- medications are administered by trained school staff
- parents provide the school with the medication in a correctly labeled pharmacy container. (The exception to reviewing the medication label would be for students receiving insulin per insulin pump)
- medication is given correctly and documented appropriately
- appropriate forms are completed prior to giving a medication, including prescriber authorization and parental consent
- medication is properly labeled and stored in a secure, safe place

3. Documentation of medication administration

Documentation of medication administration is often referred to as the "sixth right" of medication administration. The *Manual for the Training of Public School Employees in the Administration of Medication* (2006, pp. 41-42) outlines the record keeping associated with medication administration to students. Each time a medication is administered to a student, a record should be kept of:

- the name of person administering the medication
- the name of student receiving the medication
- the name of the medication
- the time it was given
- the dose given
- the route or manner in which it was delivered (e.g., oral, subcutaneous, intramuscular)
- any unusual observations or circumstances

The documentation of medication administration should occur immediately after medication is given. Failure to document that a task has been completed could lead other staff to think a medication has not been given and result in the student receiving extra doses of medication. Documenting before a task is completed could lead other staff to think medication has been given and result in the student missing a dose of medication.

With the exception of the insulin pump reservoir, when medication is brought to school, the amount of the medication in the container should be documented. When the medication is insulin or glucagon, the vial should be unopened and within the expiration date. When a vial of insulin is opened, label the bottle with the date it was opened and initials of the person who opened the bottle. Open bottles of insulin should not be accepted.

4. Storage and disposal of medical supplies

Storage

Each local school division should have policies regarding storage of medications and related supplies. Parents are responsible for providing medications, supplies, and equipment as called for in the DMMP. It is recommended by the *Manual for the Training of Public School Employees in the Administration of Medication* (Virginia Department of Education, 2006) that medications and syringes be stored in a clean locked cabinet with the keys being easily accessed in an emergency. A sample list of diabetes care supplies can be found in Appendix E.

There may be circumstances where the student has permission to carry medications and/or supplies for self-care (example: blood glucose testing). Where this is permitted, the following documentation is required:

- authorization from the health care provider for the student to self-manage diabetes care,
- permission from the parent,
- assessment by the school nurse as to the student's ability to perform the task(s) responsibly.

It should be noted that if a student is permitted to carry and self-administer medications or perform self-care tasks independently, there is an implied expectation that he or she will carry out self-care in a responsible manner. If the student does not follow the guidelines, permission to self-manage diabetes care may be restricted or revoked. Permission to carry and self-administer medications/care may not be restricted or revoked until the parent is notified. For students who carry and self-manage their diabetes medication(s), consideration should be given to housing extra supplies for them in the health office.

Disposal

School divisions should have a protocol for notifying parents about the need to pick up unused medication(s) and/or supplies. Parents should also be advised of the division's protocol for destroying unclaimed medication(s)/supplies. The *Manual for the Training of Public School*

Employees in the Administration of Medication (Virginia Department of Education, 2006, p. 53) advises that:

- parents should pick up unused medication within one week of the expiration date or when it is no longer needed at school.
- in the case of medications used by the student daily/routinely, parents should be notified that they need to pick up the medication/supplies and given sufficient time to do so.
- medications that are not picked up should be destroyed on the last student day. Destruction should be in accordance with current health care standards and district protocols with appropriate documentation.

5. Parent/guardian responsibilities

According to the *Manual for the Training of Public School Employees in the Administration of Medication* (Virginia Department of Education, 2006, p. 36), prior to administering a medication (insulin or glucagon) at school, the parent shall:

- provide the school with a written authorization form from a licensed prescriber which includes: the student's name, name of the medication, dosage, time to be given, method by which it is to be given, name of the licensed prescriber, date of the prescription, expected duration of administration of the medication, and most importantly, possible toxic effects and side effects.
- provide a new written authorization form, signed by the licensed prescriber and the parent, for any changes in medication, dosage, or the manner in which it is administered.
- provide the medication in a container labeled as required by school policy.
- administer the first dose of any new medication at home.
- transport medication to and from school per school division policy.

In addition to supplying the medication(s) their child needs, parents/guardians are responsible for providing the related supplies and equipment. A sample list of diabetes care supplies for school is found in Appendix E. Additional guidance related to medication administration may be found in the *Manual for the Training of Public School Employees in the Administration of Medication* (Virginia Department of Education, 2006).

MODULE E: INDIVIDUALIZED HEALTH CARE PLANS

Individualized Health Care Plan, Emergency Action Plan,
Diabetes Medical Management Plan

Individualized Health Care Plan (IHP)

An IHP is required for each student diagnosed with diabetes. The school nurse who is an RN must prepare the plan. The IHP is the result of the nurse's assessment of the student's needs and prescriber's orders and how best to meet them within the school environment. The IHP should be updated at least annually and as the student's health care status or needs change.

The RN will write the IHP in collaboration with the parent/guardian and health care provider (American Academy of Pediatrics, 2008).

1. The IHP must not be mistaken for an Individualized Education Plan (IEP) or Section 504 Plan.

2. The RN uses nursing assessment skills to assess the student's health status, The IHP provides a foundation for:
    a. communicating the specific care the diabetic student needs on a daily basis at school,
    b. documenting the plan of care, and
    c. identifying individuals participating in the care of the student.

3. The IHP will comply with state requirements as well as local policies and procedures. The following is a list of some recommended components in an IHP prepared for a student with diabetes (2010, pp. 22-24):
    a. student-specific demographic information
    b. current photograph of the student, if available
    c. emergency contact information for parent/guardian, parent designees, and health care provider
    d. list of known allergies and/or other chronic conditions
    e. target blood glucose ranges and appropriate interventions to help achieve these ranges
        i. blood glucose monitoring
        ii. orders for medication administration, including doses and routes
        iii. student –specific signs/symptoms of hypo or hyperglycemia with physician prescribed treatment
        iv. nutritional needs/eating plans, including times and amounts
        v. physical activity plan, including limitations
    f. student's health care supply list and storage location(s)
    g. nursing assessment and nursing diagnoses
    h. assessment of the student's developmental level with expected level of independent self-care skills (as authorized by the prescriber), and competency/adherence history
    i. desired goals and outcomes for health and education

j. specific information regarding any nursing interventions that are assigned to designated trained staff. Assigned tasks must follow nursing practice guidelines for delegation of care (National Association of School Nurses, 2005)
k. list of specific designated unlicensed assistive personnel trained and authorized to provide care
l. information on any special accommodations that must be made for field trips or extra-curricular activities
m. "disaster" or "lock-down" planning, where a 24-72 hour supply of medication(s), supplies, food, and water are stored at the school (National Association of School Nurses, 2011, p. 3.7)

Emergency Action Plan (EAP)

"Some chronic conditions have the potential to develop into a medical crisis and require an Emergency Action Plan (EAP)" (Zimmerman, 2006, p. 182). The EAP is derived from the IHP and provides staff with appropriate action steps in time of crisis.

Components of an EAP include:

- emergency contact information
- signs/symptoms that identify the situation as a health crisis
- step-by-step actions to be taken in the event of a health crisis
- basic information on the underlying health condition may or may not be included

The EAP should be signed by the parent. All school personnel who interact with the student, such as, classroom teachers, resource teachers, bus drivers, and cafeteria staff should receive a copy of the plan.

Diabetes Medical Management Plan (DMMP)

The DMMP is a plan that describes the diabetes care regimen and identifies the health care needs of a student with diabetes. The health care provider and the parent or guardian should complete this form. It is the basis for the IHP and it provides the school personnel information that is necessary to safely care for the student during the school day, on field trips, and when participating in school sponsored extracurricular activities. A new DMMP should be completed each school year and it should be in place before the first day of school. If the health care provider makes changes to a student's plan of care during the school year, the school will need a new or updated DMMP form in order to implement the changes.

Samples of Forms

Forms used by school districts may vary, but the information needed to safely care for students with appropriate parent and provider approval should be consistent with the recommendations. In the Appendix of *Guidelines for Specialized Health Care Procedures* (Southall, 2004), there are templates of various forms, including an IHP and EAP. This manual is available on the

Virginia Department of Education's Health and Medical page at:
http://www.doe.virginia.gov/support/health_medical/index.shtml

The NDEP has a sample DMMP in their publication, *Helping the Student with Diabetes Succeed: A Guide for School Personnel* (2010, pp. 99-106). It is available online at:
http://ndep.nih.gov/publications/PublicationDetail.aspx?PubId=97&redirect=true#main

The National Association of School Nurses (NASN) has published a comprehensive tool kit, *Managing Diabetes at School: Tools for the School Nurse* (2011) with forms and resources. It is available to order from the online NASN Bookstore at http://www.nasn.org

The Virginia Diabetes Council (VDC) has approved a comprehensive DMMP for school use. There is a link to the document and accompanying instructions on the Virginia Department of Education's Health & Medical page:
http://www.doe.virginia.gov/support/health_medical/index.shtml

The VDC form and instructions are also available online at their web site:
http://www.virginiadiabetes.org/resources.html

Sample forms to document the training of staff in diabetes care skills are also available in Appendix D. Sample algorithms for blood glucose monitoring/care are included in Appendix F.

MODULE F: THERAPEUTIC MANAGEMENT OF DIABETES

Medication

Students with type 1 diabetes mellitus (T1DM) require the administration of insulin to cover both carbohydrates eaten and blood glucose (BG) levels that are out of the child's target BG goal range. Most children on multiple daily injection (MDI) therapy (3 or more injections a day), or insulin pump therapy, otherwise known as continuous subcutaneous insulin infusion (CSII), will require insulin delivery at school. In addition, some children with T1DM may also require oral medications as part of their DMMP.

In order for school personnel to administer, or assist in the administration of insulin, BG levels must be monitored, and carbohydrates counted prior to giving the insulin dose. Parents of students with T1DM will need to provide the school with all the necessary medication, equipment, and/or supplies required to handle the child's medical needs. These include, but are not limited to:

- insulin
- syringes and/or 1-2 pump change set-ups
- lancing device and lancets
- BG monitor, extra batteries, and strips
- ketone sticks
- alcohol swabs
- hypoglycemia treatment supplies (e.g., glucose tabs, small juice boxes, crackers)
- glucagon emergency kit

For type 2 diabetes mellitus (T2DM,) the first recommended treatment is usually a change in lifestyle. Increased physical activity and following a specified meal plan may help to control BG levels and contribute to weight loss. Sometimes these measures are not enough to bring BG levels into the target range and medications may be added to the DMMP (American Diabetes Association, 2011b). The DMMP will specify what medications the student needs. T2DM is often managed with oral medication, but insulin may also be used to achieve glycemic control. Parents are responsible for providing medications and supplies necessary to meet their child's needs.

Nutrition

Students with diabetes have the same nutritional needs as other students. All children need to eat a healthy, well-balanced diet to promote optimal growth and development. According to the NDEP (2010, p. 50), the significant difference in meal planning for the student with diabetes is that the timing, amount, and content of the food eaten are carefully matched to the action of the insulin. The nutritional component of diabetes management should be in the DMMP.

Because carbohydrates (carbs) affect BG levels more than any other nutrient, they are the major focus of most meal planning approaches. It is important to count the total amount of carbs in a meal or snack. Carbs are found in dairy products, starchy vegetables, grains, fruits, juices, and

sweets. Be sure to check for "hidden" carbs in foods such as condiments, sauces, and dressings. There are no "forbidden foods." The NDEP does recommend that students limit "liquid carbs" such as fruit juice and soft drinks with sugar to the treatment of hypoglycemia as these carb containing foods raise BG levels quickly (2010, p. 50).

Students with diabetes usually have an individualized meal plan based upon carb counting or an exchange system. When the health care provider develops the meal plan portion of the DMMP, he/she takes into account the other components of the DMMP, factors such as medication and activity level. The goal is to balance these components of diabetes management to help the student achieve optimal glycemic control. School staff specified in the IHP must be knowledgeable of the student's meal plan requirements (Southall, 2004).

A "carb choice" or serving is the amount of food that contains 15 grams of carbohydrate. For most starches and fruits this is a ½ cup serving. It is important to read the labels on foods to determine the number of servings in a container and the grams of carbs per serving. Be sure to check the labels on sugar-free products such as cookies, candies, and ice cream. They often contain carb amounts similar to their non-sugar-free counterparts. It is preferable to use regular products in appropriate portions.

Families of students with diabetes may review school lunch menus to determine the carbohydrate content of the meals available. The food service manager should have access to the nutritional content of the food available in the cafeteria. If a food vendor for an item changes or the vendor updates their food label, be sure to check to see if there are differences in the nutritional content of the food item(s). Books such as *The CalorieKing Calorie, Fat, & Carbohydrate Counter* (Borushek, 2011) and other resources are available to help with carb counting. If the parent provides food from home, the parent should provide the school with the carb count for the food item or meal (Bulter, 2011). A diabetes educator can also help locate resources for nutritional needs.

Carb counting is most often done in one of two ways: Consistent Carb Intake or Insulin-to-Carb Ratio (NDEP, 2010, pp. 51-52). The DMMP will specify which type of meal plan the student should follow.

- Consistent Carb Intake Meal Plan
    - Students who follow this plan are provided a set amount of carbs or carb servings to eat for meals and snacks. Students who take an intermediate-acting insulin in the morning or a predetermined amount at lunch are most likely to use this plan (NDEP, 2010, pp. 52-53). Meal and snack times should remain constant. Insulin doses usually remain consistent as well. This plan is usually easy to follow, but does not readily allow for flexibility when the unexpected happens or a schedule is not routine.

- Insulin-to-Carb Ratio Plan
    - Insulin dosage is based on two calculations: a ratio of insulin-to-carbs eaten and a correction factor. These ratios are specified in the DMMP by the prescribing health care provider.

- The insulin-to-carb ratio is the amount of insulin given to cover for a stated amount of carbs that are eaten. The prescriber will commonly express it as a ratio, for example 1:15. The amount is individualized for each person in his/her DMMP and the ratio may even vary by meal.

Sample calculation of an insulin-to-carb ratio:

The student's lunchtime insulin-to-carb ratio is 1:15.
The child ate 60 grams of carbs. The formula is:
60 ÷ 15 = 4 units of insulin

- The correction factor is the amount of insulin the student needs to lower the BG into target range. The target BG is subtracted from the actual pre-meal BG. The prescriber will specify how much insulin is required for results that are over the target BG. This calculation is student-specific and may vary.
  - It is important to note that a correction dose should not be given within the 2 hours after: eating carbs, a previous correction dose, or treatment for a low BG unless there is a specific order from the health care prescriber.

Sample calculation of a correction dose:

The student's pre-meal BG is 300. The student's target BG is 150. The correction dose is 1 unit of insulin for every 50 mg/dL over 150. The formula is:
300 – 150 = 150 ÷ 50 = 3 units of insulin

- The two calculations are then added together to obtain the insulin dosage for the child. Insulin dosage calculations should be maintained as documentation.

Sample calculation of total insulin dose

Insulin-to-carb dose plus correction dose = total units
The formula is:
4 + 3 = 7 units of rapid-acting insulin

The insulin-to-carb ratio method gives more flexibility to the student, but it may also take more time and attention to track the carbs throughout the day. For younger students, a trained adult should know the child's meal plan and work with the parent to coordinate it with the school's scheduled snack and meal times when possible.

The parent should be notified in advance whenever special events are scheduled that might affect the meal plan. This includes after school activities and field trips. School days when there is an increased amount of physical activity may necessitate the child having extra snacks. Examples are the days when there is physical education class or a "Field Day."

Physical Activity

Everyone can benefit from regular exercise. Exercise and physical activity are critical parts of diabetes management. In addition to maintaining cardiovascular fitness and controlling weight, physical activity can help to lower BG levels. Students with diabetes should participate fully in physical education classes and team sports.

To maintain BG levels within the target range during extra physical activity, students may need to make adjustments in their insulin and food intake. To prevent hypoglycemia, they also may need to check their blood glucose levels more frequently while engaging in physical activity. Generally, BG levels before exercise should be over 100 and under 250. The DMMP should direct what BG levels are acceptable for exercise. If BG levels are high, ketone testing may be ordered as well as appropriate follow up if ketones are present.

The student with diabetes should eat prior to exercising if it has been more than two hours since the student has eaten. It is best to exercise or take physical education classes 30-60 minutes after a meal to allow time for food to be absorbed. A person with diabetes always needs to have a fast-acting sugar and a complex carbohydrate readily available for treatment of low blood sugar, along with plenty of water. Physical education instructors and sports coaches should be able to recognize and assist with the treatment of hypoglycemia. They should have a copy of the student's Emergency Action Plan.

Exercise increases the flow of blood in general, but especially to the muscles that are being used the most. Insulin is absorbed faster when there is increased blood flow to the exercising muscles. For example, if the insulin is injected in the arm before a run or swim, it may be absorbed quickly and cause a low blood sugar. Muscles use stored energy while exercising and after exercise, the muscles need to replace this stored sugar. They do this by taking glucose out of the blood and this may continue for up to 12 hours after exercising.

Students using pumps may disconnect from the pump for sports activities. The IHP should address storage of the pump if it is removed for physical activity. It should be stored in a secure location. If a student keeps the pump on, he/she may set it at a temporary, reduced rate of insulin while he/she is at play. Instructions for temporary basal rates should be addressed in the DMMP. According to the Virginia *Guidelines for Specialized Health Care* Procedures, the student's DMMP and IHP should include specific instructions for physical activity (Southall, 2004, pp. 23-24).

Support of Developmentally Appropriate Self- Management of Diabetes Care

The NDEP states that in addition to dealing with the usual developmental issues that are associated with growing up, children with diabetes must also learn to manage the complexities of this life-long medical condition (2010, p. 58). Since diabetes impacts all aspects of someone's life, this can complicate how the child works through normal developmental challenges. Individuals will react differently to having diabetes and the associated emotions may run the

gamut from accepting to resentful. Students may be open with others about their condition or try to hide it from others.

Children, in general, do not want to be different from their peers, but having diabetes and the associated self-care tasks can make them feel different. They may feel conflicting pressures to comply with their DMMP but also to fit in with their peers. It is important that the student feel supported and that staff be aware of emotional or behavioral issues that may need referral.

The child's ability and willingness to learn and assume responsibility for self-care tasks is individualized. The ADA's (2011a, p. S72) position on diabetes care in school is that:

> Children and youth should be allowed to provide their own diabetes care at school to the extent that it is appropriate based on the student's development and his or her experience with diabetes. The extent of the student's ability to participate in diabetes care should be agreed upon by school personnel, the parent/guardian, and the health care team, as necessary. The ages at which children are able to perform self-care tasks are variable and depend on the individual, and a child's capabilities and willingness to provide self-care should be respected.

It is important that though the child is independent with certain tasks, "supervision by caregivers must continue" (Juvenile Diabetes Research Foundation, 2011). The DMMP and the plans of care will specify which tasks the provider considers the child to have mastered and the ones for which the student needs assistance. No matter the level of independence, a student experiencing symptoms of either a high or low BG may need someone to help.

The following list of ways to support the student's healthy response to diabetes is based upon "Tips for Teachers of Students with Diabetes," which the ADA adapted from a Loudoun County, Virginia document.

- Understand that all children with diabetes are different and react differently to symptoms of low BG.
- Try not to draw attention to the child's diabetes.
- Be inconspicuous in your reminders about snacks and self-care tasks.
- Do not label children with diabetes. Never refer to the child as the "diabetic kid."
- Do not sympathize, empathize, and learn what you can do to support them.
- Always be prepared and have a snack available. Take it with you whenever you leave the classroom.
- Never leave the child with diabetes alone if they are experiencing symptoms of a low BG. If they need to go to the office or see the nurse, send a buddy with them.
- The child with diabetes needs unrestricted access to the bathroom and to water.
- Be patient, especially if they have symptoms of a low BG. Variations in BG can interfere with the student's ability to organize things or to concentrate.
- Knowledge is power. Educate yourself about diabetes and keep the lines of communication open.

Barriers to Appropriate Diabetes Management

Lack of knowledge and or fear can be a barrier to appropriate diabetes care. Caring for someone with diabetes can be stressful for the individual and the family. Some people are embarrassed by or afraid of low BG symptoms. They may manage their diabetes by not taking all of their insulin or eating extra carbs. The normal difficulties encountered by parents and their children may be compounded by the stress of diabetes care. Parents need to feel supported and may need help with educational resources.

As the child moves into the teenage years, children who were previously compliant may now rebel or not be totally honest about self-care tasks such as BG testing. In addition, the physiological changes of adolescence may make it more difficult to keep BG in the target range, despite compliance (Juvenile Diabetes Research Foundation, 2011). The ADA cited research that showed it was more difficult to achieve near normal BG levels in teens than in adults (2011b, p. S38). This can lead to the teen with diabetes feeling frustrated and contribute to the child becoming less engaged or compliant with the DMMP. Teens need support to move toward independence, but they also need supervision to make sure they are caring for themselves properly.

Age Appropriate Self-Care Guidelines

Each student is unique in his or her ability to perform self-care tasks. Various factors such as age of diagnosis, child's current developmental level, and the willingness on the part of the child and parent can influence the age at which the child assumes various self-care tasks. The following is a list of age-appropriate self-care tasks, based upon recommendations from the NDEP (2010, pp. 60-61) and the National Association of School Nursing's school nursing text (2006, pp. 775-776):

- Toddlers and preschool-aged children
    - are usually unable to perform diabetes care tasks independently.
    - need an adult to provide all or most aspects of care.
    - can usually determine which finger to prick, choose an injection site, and are generally cooperative.
    - aged 4 to 5 can collect own urine for ketone check, turn on glucometer, pinch their own skin, help with recording results, and begin to identify symptoms of low BG.

- Elementary school-aged children
    - may be able to perform their own BG checks, but still need adult supervision.
    - begin to learn, with adult supervision, some self-care tasks such as insulin administration by syringe or pump, meal planning with recognition of foods that contain carbs, carb counting, ketone testing, and record keeping related to self-care tasks.
    - begin to understand the impact of insulin, physical activity, and nutrition on BG levels.
    - unless they have an inability to recognize symptoms of low BG, should be able to recognize and tell an adult they feel symptomatic.

- Middle and high school-aged children
    - are usually able to provide self-care, depending on the length of diagnosis and the level of maturity.
    - should be encouraged and empowered to be independent with self-care.
    - will need help if experiencing a low BG.

MODULE G: MONITORING THE STUDENT WITH DIABETES

Testing Blood Glucose

Successful diabetes management depends largely on BG monitoring, which measures the effects of balancing food, exercise, and medication. All diabetes care centers around the BG level. Self-tests of BG results are measured in milligrams per deciliter (mg/dL). The physician usually requests that a student self-check BG levels at various times during the school day such as:

- before eating snacks or lunch,
- before physical activity, and
- when the student has symptoms of either a high or low BG.

Frequent testing and recording of BG levels provides the most accurate picture of the student's diabetes control. The BG self-test provides the information necessary to make appropriate choices about food and activities. The primary health care provider or diabetes educator will provide guidance on how frequently the student's blood sugar should be checked during the day in the DMMP. There is no specific number of BG checks which should be done per day as different people require different treatment options. The student's doctor or diabetes educator can work with parents and student to determine the best plan for treatment. Though it can vary, students taking insulin generally require a minimum of three or four tests per day.

Students with T1DM who are participating on sports teams may have to check their blood sugar level more frequently, especially during the first weeks of practice. Changes in the level of physical activity may alter dietary and insulin needs. One of the purposes of BG monitoring is to keep BG levels in the target range. BG target ranges are very individualized and are determined by the healthcare provider. The range is customized to the student's needs and will change as growth and diabetes treatment changes.

For students with T2DM, monitoring BG levels is just as important. Certain medications used in the treatment of T2DM can cause hypoglycemia. Regular BG monitoring can help determine if a change to the in the student's treatment is needed.

Adult supervision should be provided as indicated by the student's experience with diabetes care and maturity level. Students who demonstrate appropriate BG testing technique and competence in managing insulin requirements should be allowed to self-test their BG levels in the classroom, at various campus areas, on field trips, and/or other locations as appropriate (National Association of School Nurses, 2006, p. 770). Students should also demonstrate an understanding of school policy and procedure in the performance of self-care tasks (Virginia Diabetes Council, 2010). While documentation that a student understands school rules is not law, it does inform all parties of expectations, responsibilities, and that the school has the right to restrict/revoke the student's permission to carry and self-administer medications if the student does not adhere to the guidelines.

According to the NDEP (2010, p. 94), parents are responsible for providing the school with all equipment, supplies, medications, and plans for the care of their student with diabetes. Parents

are to be notified in advance when supplies are running low and as soon as possible, if equipment needs to be replaced.

Disposable gloves (latex or vinyl), that meet OSHA requirements for handling body fluids, are to be worn if someone is performing the testing other than the student (U. S. Department of Labor, 2008). The employer is responsible for providing personal protective equipment for its employees.

There is a variety of BG meters (glucometers) available. When several students with diabetes are in the school, different types of meters may be used. A RN or physician, knowledgeable in the use of glucose meters, must train unlicensed school personnel, who are designated to care for students with diabetes, in the proper use of each style of glucose meter. Because of the variety of meters available on the market, each with different features, a copy of the instructions for each student's meter should be kept in the health office (American Diabetes Association, 2008). Reference materials for meters should be available from the parent or manufacturer's toll-free number. Some manufacturers have instruction manuals available on their web site. As of June 2011, a list of meters with manufacturers' toll-free numbers was available on the ADA web site at: http://www.diabetes.org/living-with-diabetes/treatment-and-care/blood-glucose-control/checking-your-blood-glucose.html

BG monitoring is an important component of diabetes care. Appendix D contains samples of various diabetes skills checklists, including BG monitoring. The benefits of blood sugar monitoring at school include:

- immediate test results so that adjustments in food, medication, or activity can be made,
- information to assess response to therapy and maximize student's ability to participate in learning opportunities,
- confirmation of whether symptoms relate to low (hypoglycemic) or high (hyperglycemic) blood sugar levels, and
- decreased risk to the student of long-term health complications.

Since the BG test results are the basis for diabetes care, it is important to use the proper procedure to assure accuracy of the results. Sample algorithms for blood glucose management are contained in Appendix F. The ADA webpage lists several causes of inaccurate blood sugar test results as:

- operator error, such as finger not clean and dry,
- poor technique, including inadequate blood drop (not enough blood),
- code on test strip does not match code on meter (calibration),
- outdated or incorrectly stored test strip,
- unclean meter, and/or
- product malfunction

Procedure for Blood Glucose Testing

Note: Parent provides necessary equipment and supplies.

1. Review directions for blood testing meter, if not familiar with its operation.

2. Wash and dry hands.

3. Assemble supplies
    a. alcohol pad
    b. finger lancing device
    c. blood testing meter (glucometer)
    d. appropriate blood testing strips
    e. tissue or cotton balls and small bandage
    f. gloves
    g. student log

4. Have student wash and dry hands or test site thoroughly with soap and water. If the caregiver is performing the procedure, they should put on gloves. Washing student's hands and test site is sufficient for prepping the site; however, alcohol may be used for further prepping. Make sure the site is dry before testing. *Alcohol may cause toughening of the skin or burning sensation. If moisture (water or alcohol) remains on the skin, test results may be altered*.

5. Turn on meter and place glucose testing strip into electronic meter according to manufacturer's instructions. Check strip code, if required.

6. Ready the lancing device according to manufacturer's instructions.

7. Select a test site. If using a finger, use the sides of fingertip. (*The pads of the fingertips may be more sensitive.*) Hang the arm below the level of the heart for 30 seconds to increase blood flow. **If hypoglycemia is suspected: only use the finger for testing, do not use alternate testing site.**

8. Hold the lancing device to the side of the fingertip and push the button to prick the skin. Gently squeeze the finger in a downward motion to obtain a large enough drop of blood to cover the test pad on the test strip. *Avoid squeezing the site excessively because excess squeezing can contaminate the sample with tissue fluid, cause hemolysis of the sample, and traumatize the site.*

9. Place blood on testing strip and complete testing, according to manufacturer's instructions. Compress lanced area with tissue or cotton ball until bleeding stops.

10. Dispose of test strip and tissue or cotton ball in lined wastebasket. Dispose of lancing device in sharps container.

11. Remove and dispose of gloves. Wash hands.

12. Record results in the student's log. Refer to student's DMMP for appropriate actions. Do not refer to the BG readings as "good" or "bad." Refer to the numbers as "in" or "out" of target range, "above" or "below" target range.

Sources:

- American Diabetes Association. (2008). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available online at: http://www.diabetes.org/living-with-diabetes/parents-and-kids/diabetes-care-at-school/school-staff-trainings/diabetes-care-tasks.html

- Southall, V.H. (2004). *Guidelines for specialized health care procedures.* Retrieved May 14, 2011, from Virginia Department of Education: Health and Medical at: http://www.doe.virginia.gov/support/health_medical/index.shtml

Testing Urine

Urine testing for glucose is no longer used for diabetic management. It is recommended that urine be tested to detect the presence of ketones. The DMMP will provide authorization and instructions for monitoring the urine for ketones at school. The parent will provide the necessary supplies for testing urine for ketones. When opening a bottle of ketone test strips, be sure to note the date and your initials on the bottle. Ketone strips in a bottle expire 6 months after opening (National Association of School Nurses, 2011, p. 4.8).

When the body can't use glucose, it uses its own fat and muscle tissue for energy. Ketones are acids that are left in the blood when fat is used for energy. This can happen when there is not enough insulin given, during an illness or time of extreme bodily stress or with dehydration (American Diabetes Association, 2008). If the body does not receive adequate amounts of insulin so that it can utilize glucose, not only will blood glucose rise, but ketones will continue to build up in the blood. Increased levels of ketones result in a condition called *diabetic ketoacidosis*, also referred to as "DKA."

When there are ketones present, the body will try to get rid of them through the kidneys and lungs. The ketones will show up in the urine and may cause the breath to smell fruity. Besides fruity breath, symptoms may include nausea, vomiting, abdominal pain, rapid breathing, thirst, frequent urination, and fatigue/lethargy/drowsiness. It is important to detect and treat the presence of ketones early to prevent the build-up of ketones and progression of symptoms to DKA. DKA is an emergency and the number one reason for the hospitalization of children with diabetes. Untreated, progression to DKA may lead to severe dehydration, coma, permanent brain damage, or death" (American Diabetes Association, 2008).

DKA usually progresses over hours or days, but may progress more quickly if the student uses an insulin pump or has an illness or infection (American Diabetes Association, 2008). The student is most at risk when symptoms are mistaken for the flu, BG is not checked, and high BG is untreated.

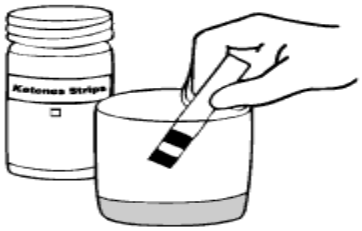
Procedure for Testing Urine

1. Review directions for urine ketone testing, if not familiar with them. Wash hands.

2. Gather supplies:
    a. bottle of ketone test strips
    b. urine cup
    c. gloves, if caregiver performing the test
    d. clock or watch with second hand

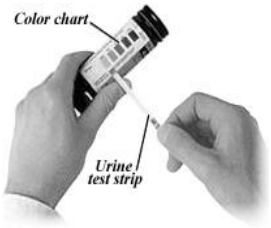
3. Have student urinate into cup.

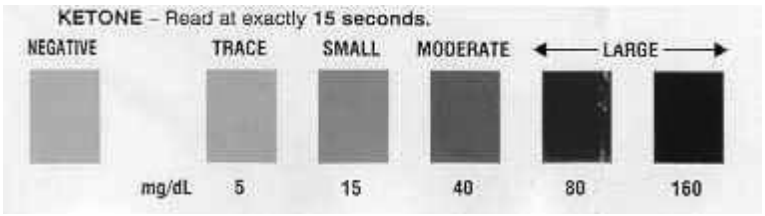
4. Caregiver should done gloves if performing test for student. Dip the test strip into the urine and shake off excess urine.



5. Wait the specified amount of time in the directions on the bottle of test strips, usually 15 seconds.

6. Read the results by comparing the color on the test strip to the chart on the bottle.





7. Record the results on the student's log and take action per the DMMP.
    a. In general, if results are moderate or large, the student should not engage in physical activity and the parent/guardian should be called to take the student home for observation and/or medical care.
    b. If urine ketone results are trace or small; notify the parent, increase the fluid intake, and monitor the child.

Sources:

- American Diabetes Association. (2008). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at http://www.diabetes.org/living-with-diabetes/parents-

and-kids/diabetes-care-at-school/school-staff-trainings/diabetes-care-tasks.html

- National Association of School Nurses. (2011). *Managing diabetes at school: Tools for the school nurse.* Silver Springs: MD, National Association of School Nurses.

- Southall, V.H. (2004). *Guidelines for specialized health care procedures.* Retrieved May 14, 2011, from Virginia Department of Education: Health and Medical at: http://www.doe.virginia.gov/support/health_medical/index.shtml

MODULE H: INSULIN ADMINISTRATION

Proper Storage of Insulin:

It is important that insulin be stored properly. According to the ADA (2008), insulin vials should not be kept beyond expiration dates or exposed to extremes in temperature. Extreme temperatures, below 36°F or above 86°F, and excess agitation should be avoided. Freezing results in insulin becoming inactive.

Most types of opened vials of insulin will stay fresh, out of refrigeration, for up to one month, if temperatures do not exceed 86°F (American Diabetes Association, 2008). Opened insulin pen cartridges may last less than 30 days. Unopened vials should be refrigerated and are considered good until their expiration date. Always refer to manufacturer recommendations for appropriate storage instructions.

Types of Insulin

According to the ADA (2008), there are four basic types of insulin, each is classed by how it works:

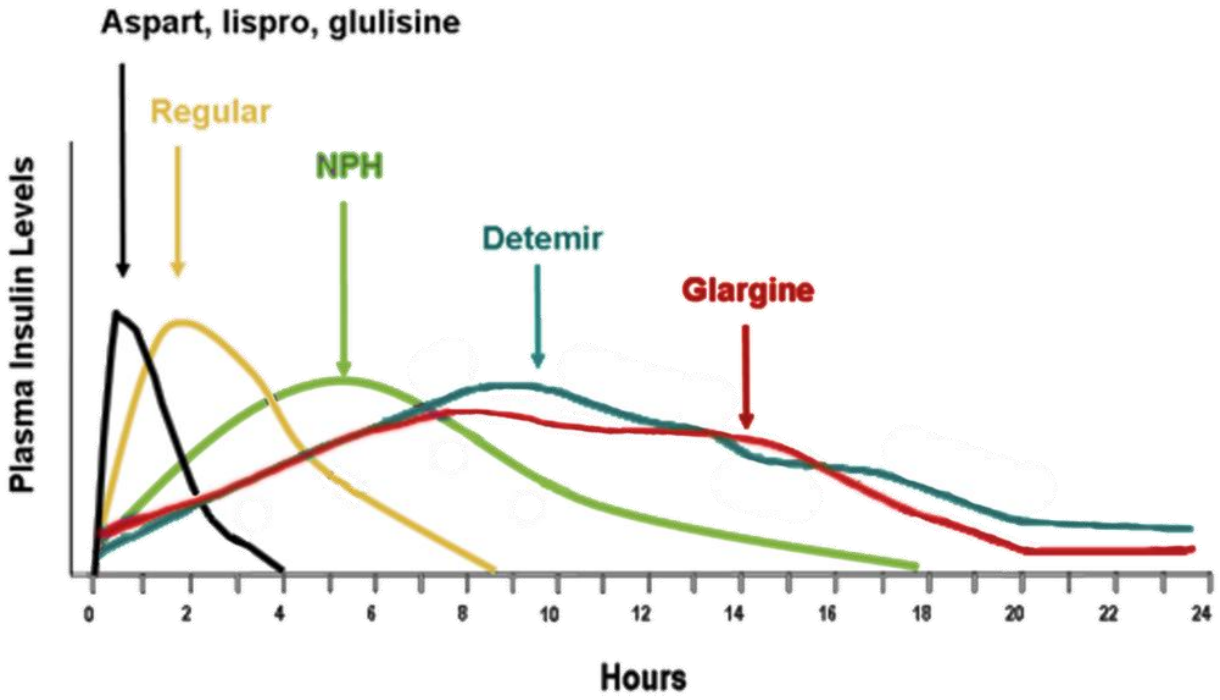
- Rapid-acting - Humalog ®, Novolog ®, Apidra
- Short-acting - Regular
- Intermediate-acting - NPH
- Long-acting - Glargine (Lantus), Detemir (Levemir)

Rapid-acting insulins take effect quickly, within 10-15 minutes. This type of insulin is used primarily to treat high blood sugars, to "cover" an increase in blood sugar after eating and/or right before meals. It is also used in insulin pumps. If the student receives an injection of rapid-acting insulin right before their meal or snack, make sure that it is not delayed for more than 15 minutes. This type of insulin may be referred to as *bolus* insulin.

Short-acting insulins are similar to rapid-acting ones. They may also be called *bolus* insulin, but when compared to a rapid-acting insulin, their peak is delayed and their duration is longer.

Intermediate and long-acting insulins are called *basal* insulins. They are not used to treat acute high blood sugar, but rather for coverage during times when the person is not eating, overnight or between meals.

The following chart was copied from the ADA Power Point, *Insulin Basics 2008*. It shows the different types of insulin with their peaks and durations:



NOTE:
Based on the legislation passed by the 1999 General Assembly, the school administration, the student's diabetes medical management team, and the parent or guardian will have to determine for students unable to administer their own insulin, what is involved in "assisting in routine insulin injections" and "assisting in the administration of insulin." It must also be determined to what extent unlicensed assistive personnel may be permitted to "assist in the administration of insulin injections" during the school day.

Dosage

Doses of insulin are measured in "units." "There are 10 milliliters in one vial of insulin, which is equivalent to 1000 units. One unit of insulin can alter a blood glucose level; therefore, ***it is imperative that the ordered dosage be EXACT!***" (Southall, 2004). Whenever possible, a second person should verify the insulin dose before it is given. Insulin should only be administered from a properly labeled prescription vial from a pharmacy**.** Specific written authorization from the student's health care prescriber and written parental consent is required for insulin administration. Written dosing instructions and consents should be contained in the DMMP.

Virginia law, *COV* 22.1-274, specifies that if insulin is to be administered by unlicensed school personnel, who have received training in the administration of insulin and glucagon, the parent and the student's health care provider must provide written approval.

The following diabetes care procedures have been adapted from the *Virginia Guidelines for Specialized Health Care Procedures* (2004), the National Association of School Nurses' *Managing Diabetes at School: Tools for the School Nurse* (2011), and the ADA's training

curriculum, *Diabetes Care Tasks at School: What Key Personnel Need to Know* (2008). The ADA Power Points are available online at: http://www.diabetes.org/living-with-diabetes/parents-and-kids/diabetes-care-at-school/school-staff-trainings/diabetes-care-tasks.html

A. Procedure for Insulin Administration by Syringe

This injection procedure is for the administration of Regular or rapid-acting insulin, not for mixing with other insulin.

Training of unlicensed staff must be done by a registered nurse (preferably a certified diabetes educator) or physician (preferably an endocrinologist). Insulin should be administered only in accordance with the orders of a licensed prescriber and written parent permission. Specific guidelines should be provided by the primary health care provider for the conditions (blood glucose levels) under which insulin is to be administered.

Note: Parent provides necessary equipment, supplies, and medications.

1. Wash hands.

2. Assemble equipment
    a. vial of insulin
    b. insulin syringe with needle
    c. alcohol prep pad
    d. cotton balls or spot bandage (optional)
    e. gloves, if done by anyone other than the student
    f. sharps container

3. If insulin is cold, warm the vial in the palm of the hand to room temperature. *Injecting cold insulin may cause pain and may affect absorption.*

4. Check insulin type/brand for agreement with the prescriber's order.
    a. If this is a new bottle of insulin, remove the flat, colored cap. Record the date the bottle is opened and the initials of the person who opened the bottle on the label. **Do not** remove the rubber stopper or the metal band under the cap.
    b. **Check expiration date** of the vial of insulin. If the bottle was previously opened, also check the date it was opened.

5. Clean the rubber top of the insulin vial and let dry for a few seconds.

6. Remove the cap from the syringe. Fill the syringe with air equal to the number of units of insulin needed. Air is always injected into the vial to prevent creating a vacuum inside the vial as insulin is removed. Inject air into the insulin bottle with syringe remaining in bottle, invert and pull plunger back beyond the number of units desired. Keeping the syringe in an upright position, clear any air by pulling plunger back and tapping syringe to raise air bubbles to the top. Push plunger to desired amount of units, ensuring that no air bubbles remain and withdraw the syringe. ***Air bubbles left in the syringe can alter the desired dose***.

7. Slip needle back into cap without touching cap or needle (see procedure for One-Handed Needle Recapping in the *Virginia Guidelines for Specialized Health Care Procedures,* if syringe must be recapped).

8. Put on gloves, select the site to be used and prep with alcohol and let dry. If area is dirty, wash with soap and water and dry. Any subcutaneous tissue can be used for injection sites. The best absorption is in the lower abdomen, followed by the upper, outer arms, tops of the thighs and lastly the upper areas of the buttocks. Exercise and heat (like the warmth from a heating pad or whirlpool) also hastens absorption of an injected area.

8. Pinch up skin and tissue with one hand. With the other hand, hold the syringe, with the eye of the needle pointing upward, like a pencil. Dart the needle into the "soft pocket" (area that lies directly in front or behind the pinched up skin) at a 90 degree angle.

9. Inject insulin in one to five seconds. Do not aspirate or pull back the plunger.

10. Release pinched up skin, count to five, then remove needle while applying gentle pressure at the injection site for 10-15 seconds. This will help to prevent leakage from the site.
    Take care to avoid injecting into the muscle, as it will hasten absorption. Do not massage the area as it irritates the tissue and hastens absorption.

11. Dispose of syringe with needle intact into a sharps container. **<u>Do Not Recap Syringe</u>**.
    Recapping a contaminated needle can result in a needle stick injury.

12. Document in student log the dose of insulin given; time given, site used and any reactions or problems noted.

<u>B. Procedure for Insulin Administration by Pen Injector</u>

An insulin pen is an insulin delivery system that generally: looks like a large pen, uses an insulin cartridge rather than a vial, and uses disposable needles. Insulin pens assist in preventing dose errors that may occur with a syringe and vial. It provides a means of delivering an accurate dose in a convenient manner. Insulin pens should be handled and stored according to manufacturer's instructions. There are several styles of insulin pens, depending on the manufacturer, but the procedure for use is similar.

Some pens use replaceable insulin cartridges. When the cartridge is empty a new cartridge is placed in the pen. Other pens do not use replaceable cartridges and the whole pen is disposed of when the cartridge is empty. Most pens use special pen needles which can be extremely short and thin. All pens use replaceable needles.

It is easy to use an insulin pen. If a pen with insulin suspension is used, such as NPH or a premixed insulin, gently shake the pen to be sure the insulin is mixed prior to use. Pens are easy enough for kids to use, and are excellent for use at school or while out and about. Pen needles should be removed after each use to prevent air from entering the cartridge and to prevent insulin from leaking out. There are many different pen needles available, in varying lengths and diameters.

The smallest pen needles are very short and very thin and help minimize the discomfort of injection. Pens need to be held in place for several seconds after the insulin is delivered to make sure that no insulin leaks out. Syringe users who switch to pens should pay close attention to the injection site and test their blood glucose often as they become accustomed to pen injections.

While pens offer injection convenience, they don't allow mixing of multiple types of insulin. Pens offer repeatability in dosing accuracy compared with syringes. Also, because dosing with a pen involves dialing a mechanical device and not looking at the side of a syringe, insulin users with reduced visual acuity can be assured of accurate dosing with a pen.

1. Obtain a blood glucose reading prior to insulin administration.

2. Determine insulin dose with health care provider’s orders.

3. Wash hands.

4. Assemble equipment:
    a. insulin pen device
    b. pen needle
    c. alcohol prep pad

d. cotton balls or spot bandage (optional)
e. gloves (if done by anyone other than student)
f. sharps container

5. Check insulin type/brand. This must match health care provider's written orders.

6. Check the level of insulin remaining in the insulin cartridge. *Cartridges are made for multiple doses. Ensure that enough insulin remains in the cartridge for accurate dosing.*

7. Attach new needle. Remove outer plastic cap and plastic needle cover. Place outer cap on a flat surface with open end facing up. *This will assist with needle disposal after insulin is given.*

8. Dial in two (2) units of insulin to perform an "air shot" to "prime" the needle. Insulin should appear at the needle tip; if it does not, repeat procedure. *Change in temperatures can cause air intake. This procedure ensures that any accumulated air will be released, thereby ensuring accurate insulin dosage.*

9. Dial in prescribed dose.

10. Cleanse the skin with alcohol and allow to dry before administering the injection.

11. Pinch up the skin at the selected site and dart the needle into the soft pocket at a 90 degree angle. *The soft pocket lies directly in front of or in back of the pinched up skin.*

12. Push the plunger down and inject insulin at a steady rate.

13. Release the pinched up skin. Count slowly to three (3) or five (5) and then remove the needle. *Some pen manufacturers require a longer count*.

14. Grasping the pen, place the needle into plastic needle cap that was left upright on a flat surface. Unscrew the needle tip and carefully discard into a sharps container. *Do not lift the cap up with fingers to cover needle tip. Leave cap on the counter and use the pen to place the needle into cap to avoid the possibility of a needle stick injury (see Procedure for One-Handed Needle Recapping.) The needle must be changed after each injection, as leaving the pen needle attached leaves an open passageway into the insulin and contamination may occur*.

15. Document appropriately in student log.

C. Procedure for Insulin Administration by Pump

Insulin pumps are computerized devices, about the size of a cell phone or pager that deliver a continuous pulse of insulin. Students frequently wear their pumps hooked to their belts, or in their pants or shirt pocket, like a cell phone. Insulin is delivered through tubing that ends with a short plastic catheter or metal needle, inserted just under the skin in the fatty tissue.

The internal workings of a pump are simple; it has a reservoir that looks like a large version of a regular syringe. Typically the reservoir holds a two to three day supply of rapid-acting insulin. Pumps immediately supply insulin to the wearer, therefore medium- or long-lasting insulin is not used. The pump is like a syringe with a plunger that is pushed by a small pump to force the insulin out of the reservoir.

The pump must be told exactly what to do. It is programmed to deliver a "basal" amount of insulin throughout the day and boluses as needed for meals and when the wearer's blood sugar is high. For example, if the wearer's meal plan calls for five units to cover a meal, he or she programs that number on the pump's screen. With this command, the exact amount of insulin is pumped into the thin, clear plastic tubing that delivers the insulin via the cannula resting just below the skin in the fatty tissue of the pump wearer. Newer models may have calculation and/or reminder "wizard" functions to help users (American Diabetes Association, 2008).

The cannula is changed every two or three days. With the aid of a small needle, the plastic cannula is inserted through the skin into the fatty tissue and then taped in place. In newer products, the needle is removed and only a soft catheter remains in place. The insulin bolus empties out of the cannula and is absorbed into the body in the same way insulin injected through a syringe would be. The infusion set is where the clear plastic tube connects with the cannula. The student can disconnect the tube from the set for sports, showering, or any other short activity.

The pump delivers a basal rate of insulin (the constant base line) in much the same way as the human pancreas. Working with his or her healthcare team, the student with a pump programs the amount of insulin to be released throughout the day. Unless programmed differently, the basal settings release a constant amount of insulin throughout the day. Not all pumps are the same, but they do work in a similar manner.

These machines do a pretty good job of imitating a pancreas, but unlike a healthy pancreas, pumps can't work automatically. They can't decide how much insulin you need or when you need it. This makes the person running it the most important part of the pump. Every action a pump makes starts with the user. So everything that's important in controlling diabetes by using insulin and syringes is just as important when wearing a pump. To use a pump one must be willing to check blood glucose levels frequently and learn how to make adjustments in insulin, food, and physical activity in response to those test results. The student may or may not need assistance with these tasks, it depends upon the individual (American Diabetes Association, 2008).

Each pump is different and those trained to administer insulin need to be trained on the individual student's model. In the DMMP, it should specify where at school the student will keep a set of backup pump supplies and an alternate means of administering insulin, just in case there is a problem such as the pump malfunctions, cannula comes loose, the BG is way above target range, or there are ketones in the urine (American Diabetes Association, 2008). Staff should also know how to suspend or disconnect the pump in case the student becomes unconscious or has a seizure.

As truly remarkable as a pump is, it is not a cure for diabetes. It is simply a different way to deliver needed insulin. And for some people, it's a better way.

MODULE I: HYPERGLYCEMIA

Hyperglycemia, or "high blood sugar", or high blood glucose (BG), is when the level of sugar in the blood is greater than 240 mg/dL. Over a long period of time, even moderately high BG levels can lead to serious complications, such as blindness, heart disease, kidney failure, and amputations. In the short term, hyperglycemia can result in poor academic performance by interfering with the ability to concentrate and reason. Students who will be checking their blood sugars at various times during the day are generally able to self-treat. However, students may require occasional assistance.

Prevention

Hyperglycemia or too high blood sugar levels in children who are diagnosed with diabetes can be the result of such things as:

- taking too little insulin
- ingesting food that is not covered by the appropriate amount of insulin
- decreasing the usual amount of exercise or activity
- using "expired" insulin or insulin that was not stored properly and has lost potency
- having an illness, infection, or injury
- being stressed or emotionally upset
- having hormone fluctuations as with menstrual cycles or using certain medications
- rebounding from a low blood sugar
- no apparent reason

Timing is very important in the prevention of hyperglycemia. The ADA recommends that individuals with diabetes stick to a schedule: eat on time, check the BG on time, take medications on time, and exercise on time. Make sure that insulin dosing is accurate as is accounting for meals and snacks. It is important to keep as regular a routine as possible.

Symptoms

The usual signs of hyperglycemia are:

Mild	Moderate	Severe
• Blood glucose usually over 240 • Increased thirst • Frequent urination • Fatigue/sleepiness • Increased hunger • Loss of concentration • Blurred vision • Urine ketones (0-small)	• Blood glucose usually over 240 • Sweet breath • Dry mouth • Nausea • Stomach cramps • Vomiting • Urine Ketones (Moderate-Large)	• Blood glucose usually over 240 • Labored breathing • Very weak • Confused • Unconscious • Urine ketones (Moderate-Large)

Treatment

The goal of treatment is to lower the blood sugar. Each student should have a DMMP that is consulted to determine the plan of action. Treatment is dependent on how high the blood sugar is, whether or not urine ketones are present, and if the student is symptomatic. Possible interventions include administering additional insulin, encouraging sugar-free fluids such as water and diet soda, checking urine ketones, and limiting physical activity.

Mild	Moderate	Severe
1. Drink zero-calorie fluids (i.e. water) 2. Check urine ketones 3. Decrease activity if ketones present 4. Notify parents	1. Drink zero-calorie fluids (i.e. water) 2. Check urine ketones 3. Decrease activity, call the doctor, anti-nausea suppository if prescribed 4. Notify parents	1. Call 911 2. Notify parents 3. Notify health care provider if parent cannot be reached

Students should have free and unrestricted access to water or sugar-free liquids and the restroom.

Parameters as to when to notify parents and/or the physician should be contained in the DMMP.

Prolonged hyperglycemia can cause a potentially life threatening condition called diabetic ketoacidosis (DKA). Symptoms of DKA include a fruity breath odor, nausea, vomiting, stomach pain, and, if untreated, deep breathing, increasing sleepiness, coma, and death. Students who use insulin pumps can go into DKA in a matter of hours if their pumps stop delivering insulin appropriately.

Sources:

- American Diabetes Association. (2008). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available online at: http://www.diabetes.org/living-with-diabetes/parents-and-kids/diabetes-care-at-school/school-staff-trainings/diabetes-care-tasks.html
- Southall, V.H. (2004). *Guidelines for specialized health care procedures.* Retrieved May 14, 2011, from Virginia Department of Education: Health and Medical at: http://www.doe.virginia.gov/support/health_medical/index.shtml

MODULE J: HYPOGLYCEMIA

Hypoglycemia, also called "low blood sugar" or "low blood glucose", is usually defined as blood glucose values below 70 mg/dL. It is the greatest immediate danger to students with diabetes. **Low blood sugar can develop within minutes and requires immediate attention. Never send a child with suspected "low blood sugar" anywhere alone.**

Causes

- too much insulin
- skipping or delaying meals or snacks
- not eating enough food to cover the amount of insulin taken
- exercising too long or intensely
- combination of any of the above

Symptoms

Hypoglycemia is not always preventable and not all students, especially young children, will recognize the symptoms. It is imperative, therefore for school personnel to become familiar with the signs and symptoms.

1. **Mild/Moderate Symptoms:**
    a. shakiness
    b. weakness
    c. dizziness
    d. cold, clammy skin
    e. hunger
    f. drowsiness
    g. sweating
    h. paleness
    i. rapid heart beat
    j. visual disturbances
    k. complaining of "feeling funny"
    l. numbness or tingling of lips
    m. yawning
    n. headache
    o. confusion
    p. inability to concentrate
    q. changes in behavior (irritability, crying, combativeness)
    r. slurred speech
    s. nausea

2. **Severe Symptoms**:
    a. inability to swallow
    b. unconsciousness (extreme cases)
    c. seizures (extreme cases)

Symptoms vary from person to person and from episode to episode. Warning signs and symptoms of low blood sugar happen suddenly and can be mistaken for misbehavior. Many students will not have an awareness of low blood sugar symptoms until around ages 7 or 8 years.

Prevention

- Students should check blood sugar routinely.
- Testing in the classroom should be allowed.
- Meals and snacks should be eaten on as regular schedule as possible.
- Meals and snacks should not be skipped.
- Students should be allowed to eat in the classroom.
- Injection sites should be rotated.
- The exact amount of insulin administered should be double checked.
- Plan for extra food and/or reducing insulin amounts before exercise, in accordance with the DMMP.
- Increase the bedtime snack on unusually active days to avoid hypoglycemia during the night while asleep.

Treatment

Treatment is dependent on the severity of the symptoms. Since some of the symptoms are similar to those for hyperglycemia, **always treat for hypoglycemia if in doubt.** Specific treatment should be outlined in the DMMP, prepared by the health care team, but will look similar to the information given below:

For students who can swallow, follow the "Rule of 15"

1. Treat with 15 grams of a fast-acting carbohydrate source
    a. Examples of appropriate foods
        i. 4 oz. juice
        ii. 6-8 oz. regular soda
        iii. 2-4 glucose tablets
        iv. 5-6 Lifesavers or similar candy
        v. 6-8 oz. fat free milk

2. Wait 15 minutes, then recheck the blood sugar.

3. If the blood sugar is less than the target range, usually less than 70 mg/dL, keep repeating the 15 grams of carbohydrate and rechecking blood sugar level 15 minutes later until the BG level is back in the desired range. If unable to raise the BG to > 70 mg/dL despite fast-acting glucose sources, notify the parents immediately. Refer to the DMMP for the number of times to treat before contacting the parent.

4. When the blood sugar level is back in the target range, usually over 70 mg/dL, and it is time for a snack or meal, allow the student to eat as usual and cover the meal with insulin as ordered. If the meal or snack time is more than an hour away or the student will be

participating in physical activity, give a protein and carbohydrate snack.

a. Examples of appropriate foods
    i. ½ sandwich with ½ cup milk
    ii. 4 graham crackers squares with peanut butter or cheese
    iii. 6 saltine crackers with peanut butter or cheese

For those students who can't swallow, this is a medical emergency!!

They may be unconscious, unresponsive or having a seizure. Never attempt to give the student food or drink or put anything in the mouth when a student is experiencing these symptoms!

1. Call 911.

2. Position child on his/her left side in a safe area. After administration of glucagon, as the child regains consciousness, nausea and vomiting usually occurs.

3. Inject glucagon following the procedure below.

4. Notify parents and diabetes medical management team.

Procedure for Giving Glucagon for Severe Hypoglycemia

Note: Parent provides necessary equipment, supplies, and medications.

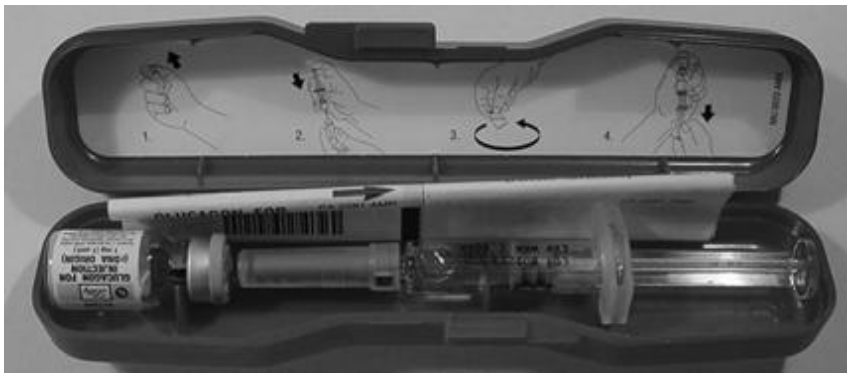
1. Verify signs of severe low blood glucose:
    - unable to swallow
    - unconscious
    - combative
    - uncooperative
    - having seizures

    Signs are so severe that student cannot participate in care.

2. **Have someone call emergency medical services (911), school nurse, and family.** ***The student should not be left unattended****. If seizures occur, follow the procedure for managing a seizure.*

3. Place child on left side or in upright position if restless/uncooperative. Maintain head position to one side to prevent aspiration.

4. Obtain glucagon kit. Wash hands (if possible) and put on gloves.



5. Flip cap off of the glass vial (bottle) containing the dry powder. Remove the needle cover from the syringe.

6. Take the fluid-filled syringe in the glucagon emergency kit and inject the fluid into the vial containing the glucagon powder. Shake gently or roll to mix until all powder is dissolved and solution is clear. Inspect medication for color, clarity, and presence of lumps. Solution should be clear and colorless.

7. Hold the vial upside down and withdraw the prescribed amount of glucagon back into the syringe. The prescribed amount should be specified in the student's individualized health care plan. Withdraw the needle from the vial. *Generally, if the student weighs >45 pounds, the full vial (1 cc) of glucagon may be injected. If the child weighs <45 pounds, inject ½ of the solution.*

8. When possible, the injection site should be exposed and cleaned. However, glucagon can be administered through clothing, if necessary. Suggested sites include the outer thigh, upper outer buttock, or arm.

9. Inject the needle straight into the muscle of the selected site and inject glucagon.

10. Withdraw the needle and press the site with a cotton ball or wipe. Massage the injection site for 10 seconds; apply bandage if needed.

11. Do not recap syringe. Put used syringe in sharps container.

12. Stay with the student. It may take 15-20 minutes for the student to regain consciousness.

13. Recheck the blood sugar. Follow the student's specific instructions for response to results. Some students may have a second injection of glucagon ordered if glucose remains low.

14. The student may be given sips of fruit juice or regular soda once awake and able to drink. This may be followed by a snack containing protein and carbohydrates such as a peanut butter sandwich or cheese crackers to keep blood sugar levels elevated to normal levels and to prevent recurrence.

15. Do not be surprised if the student does not remember being unconscious, incoherent or has a headache. The blood sugar may also rise over 200 and nausea or vomiting may occur.

16. When emergency services arrive, the student is to be transported for medical care.

17. Document in student log.

Source:

- American Diabetes Association. (2008). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at: http://www.diabetes.org/living-with-diabetes/parents-and-kids/diabetes-care-at-school/school-staff-trainings/diabetes-care-tasks.html

MODULE K: STORAGE AND DISPOSAL OF MEDICAL SUPPLIES

Recommended school supplies

Parents are responsible for providing the school with all the supplies and equipment necessary to implement the DMMP and related educational plans (The National Diabetes Education Program, 2010; American Diabetes Association, 2011a). Parents will need to meet with the school nurse, teacher(s), and necessary school personnel before the student with diabetes attends school to discuss the needs of the student and the school schedule. The following supplies should be available in the school health office and will need to be replaced by the parent as they are used. For an itemized list of supplies, see Appendix E.

- blood glucose meter and test strips
- lancing device and lancets
- urine ketone strips
- glucagon emergency kit
- concentrated sugar source
    - glucose tablets
    - cake icing or gel (fat free)
- all snacks (i.e. cheese or peanut butter crackers)
- insulin and insulin syringes
- insulin pen and disposable needles
- insulin pump supplies

Storage and disposal of medical supplies

Each local school division will have policies regarding storage of medications and syringes. It is recommended by the Virginia Department of Education in the *Manual for the Training of Public School Employees in the Administration of Medication* (2006, p. 78) that medications and syringes be locked in a medicine cabinet; however, the keys to the cabinet should be easy to access in an emergency.

Used needles, syringes, and lancets are to be disposed of in a properly labeled biohazard sharps container.

Parents should pick up unused medication within one week of the expiration date or by the last day of school. Parents should be notified and given sufficient time to pick up remaining medication, according to school policy. Medication remaining after the designated date for pick up shall be destroyed (Virginia Department of Education, 2006, p. 36).

MODULE L: DOCUMENTATION

Documentation is the legal record that medication has been ordered, parents have given permission to administer it and that the school staff have given the medication and/or performed procedures. Students should have individual health records for documenting medication administration and/or completion of procedures. Documentation is commonly considered the "sixth right" of medication administration.

Student health records are education records and are protected under the Family Education Rights and Privacy Act (FERPA). Records should be securely maintained to ensure student privacy, per school board policy. Forms for documenting the administration of medications and treatments vary by school district. Student health records should be maintained in accordance with the appropriate Records Retention and Disposition Schedule(s) from the Library of Virginia (2011).

The following documentation must be maintained for students with diabetes:

- signed authorizations, updated annually by the parent and physician
    - diabetes medical management plan
    - individualized health care plan
    - emergency care plan
    - permission for unlicensed assistive personnel to give insulin/glucagon in the absence of a licensed health care provider as outlined in the *COV*
- medication administration log
- blood sugar log
- carbohydrate count log
- nurses notes of any care provided, including non-diabetes related care
- description of any complications from medications and/or treatments

MODULE M: EMERGENCY PLAN

Each student diagnosed with diabetes should have an emergency care plan and a diabetes emergency kit. The kit should be kept in a secure location known to the student and to any school staff member who may be treating hypoglycemia. If the student leaves the campus, e.g. to go on a field trip, the kit should go with the student. The label on the kit should state "Diabetes Emergency Kit" along with the student's name.

An emergency care plan should be written for school personnel who come in contact with the diabetic student during the school day. The emergency care plan should be based on the information in the student's DMMP. The plan should summarize how to recognize and treat hypoglycemia and hyperglycemia. It should be distributed to all personnel who have responsibility for the student, during the school day and during school-sponsored activities (The National Diabetes Education Program, 2010, p. 97). Sample plans are available Section 3 of the NDEP book, *Helping the Student with Diabetes Succeed: A Guide for School Personnel.*

For each student in the school with diabetes, a source of fast-acting sugar and a small snack (ex. cheese crackers and box juice) should be readily available to the student. The school clinic's Emergency Evacuation Bag should also be stocked with similar non-perishable foods in case of a diabetic emergency (Southall, 2004, p. 26).

In the event of natural disasters or other emergency situations, students may need to stay at school. The family should be encouraged to provide an emergency supply kit containing a 72 hour supply of the following items as appropriate:

• Blood glucose meter, testing strips Lancets and batteries for meter • Urine ketones strips • Insulin and supplies • Insulin pump and supplies including syringes • Other medications	• Antiseptic wipes • Fast-acting source of glucose • Carbohydrate-containing snacks • Hypoglycemia food supplies (for 3 episodes): quick-acting sugar and carbohydrate/protein snacks • Glucagon emergency kit

MODULE N: RESOURCES & REFERENCES

American Diabetes Association
ATTN: National Call Center
1701 North Beauregard Street
Alexandria, Virginia 22311
http://www.diabetes.org/
1-800-342-2383

Juvenile Diabetes Foundation
120 Wall Street, 19th Floor
New York, New York 10005-4001
http://www.jdrf.org/
1-800-JDF-CURE
1-212-785-9595

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Appendices

Appendix A

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

Adopted by Virginia Board of Nursing – July 20, 1999
Accepted by Virginia Board of Medicine – July 1999
Approved by Virginia Board of Education – July 22, 1999

Authorization

Code of Virginia. Chapter- 570 of the 1999 Acts of the Assembly, An Act to amend and reenact §§8.01-225, 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 Individual 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's parent or guardian.

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

B. The requirement for an individualized healthcare plan for each student to be initially prepared and updated annually.

C. Rights and responsibilities of the student, the physician, the parent or guardian, the 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. Individual with Disabilities Educational Act (IDEA)

2. Section 504 of the Rehabilitation Art

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

1. 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 treating 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

1. Existing resources in community, such as organizations and written materials.

Appendix B

Glossary

Blood Glucose Level: The amount of glucose or sugar in the blood. For monitoring/testing the student independently or with assistance use a drop of their blood and a specially calibrated device to determine the current blood glucose level.

Bolus: A dose of insulin delivered when a child eats or to lower high blood glucose levels in response to a high blood glucose reading.

Delegation: The transference to a competent individual the authority to perform a selected task or activity in a selected situation by a nurse qualified by licensure and experience to perform the task or activity.

Diabetic Ketoacidosis (DKA): Severe, out-of-control high blood glucose levels that need emergency treatment. DKA happens when blood glucose levels get too high or insulin levels are far less than the body needs. This may happen because of illness or taking too little insulin. The body starts using stored fat for energy and ketone bodies and acids build up in the blood. The signs include nausea and vomiting, stomach pain, deep, rapid breathing, flushed face, rapid weak pulse, dry skin and a fruity breath odor. Fluids and insulin must be given quickly since ketoacidosis can lead to coma and even death.

Direct supervision means the supervisor is on the premises but not necessarily immediately physically present where the tasks and activities are being performed.

Carbohydrate Counting: The method of calculating the number of grams of carbohydrate in the food the child eats. In conventional insulin therapy when used in its simplest form, this is a method of maintaining consistency in carbohydrate intake from day to day. When this is used in intensive therapy it serves as the basis for determining the amount of insulin to administer for any given meal.

Glucagon: A hormone produced in the pancreas that raises the level of glucose in the blood. A Glucagon injection may be given to diabetic child in an emergency to raise extremely low blood glucose levels.

Hyperglycemia: A condition in which blood glucose levels are elevated, generally 240 mg/dl or higher.

Hypoglycemia: A condition in which blood glucose levels are low, generally 70 mg/dl or lower.

Individualized Health Care Plan: A nursing care plan developed by the school nurse describing the way health related services will be provided to specific students in the

school setting. It can be a stand-alone care plan that contains the items listed on page 18 or an attachment to the *Diabetes Medical Management Plan*, which is provided by the physician and parent/guardian. The attachment should specify the unlicensed assistive person who will be delegated and trained to provide selected tasks in the school setting regarding blood glucose monitoring and insulin administration. It should also include any other information not covered in the **Information Sheet for the School Management of Diabetes Mellitus** that the school nurse identified during the care planning process with parents and school personnel.

Insulin: A hormone secreted by the islet cells in the pancreas that allows the body's cells to absorb glucose for energy. It is used as a medication when the body does not make enough insulin to maintain proper blood glucose levels.

Mg/dL- Milligrams per deciliter: A unit of measurement used in blood glucose monitoring to describe how much glucose is in a specific amount of blood.

Nonmedical assistive personnel: Any individual who has been trained and delegated to perform health-related services for students while they are in school. May also be referred to as unlicensed assistive personnel (UAP).

Nursing Care Plan: See **Individualized Health Care Plan (IHCP).**

School Nurse: A professional nurse, registered and licensed to practice in Virginia who is employed by the county health department, local school district or contracted by the county health department or local school district from a community based agency. The school nurse may be assigned to one or more schools and provides leadership and services consistent with the Virginia Nurse Practice Act (Chapter 30) and the Virginia Departments of Education and Health School Health Services Program. Ideally, the school nurse should have a minimum of a Bachelor of Science degree, National School Nurse Certification, with experience and additional education in pediatric assessment and intervention of the school-age child.

Sliding Scale: A medical order for adjusting the insulin dose on the basis of blood glucose monitoring. It is sometimes referred to as supplemental insulin or a correction dose. In some cases the amount of insulin to be given is calculated with a simple mathematical formula specific to the student.

Supervision: The provision of guidance by a qualified nurse and periodic inspection by the nurse for the accomplishment of a nursing task or activity provided by unlicensed assistive personnel. The nurse must be qualified and legally entitled to perform such task or activity. **Direct supervision** means the supervisor is on the premises but not necessarily immediately physically present where the tasks and activities are being performed.

Appendix C

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 nonemergency 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.

Appendix D

Sample Skills Checklists

BLOOD GLUCOSE/BLOOD KETONE MONITORING SKILLS CHECKLIST

Unlicensed Assistive Personnel (UAP): _____

School Nurse/Instructor: _____

	Training Date/Initials	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
A. States name & purpose of procedure.					
B. Preparation:					
1. Reviews Standard Precautions.					
2. Identifies where procedure is done.					
C. Identifies supplies:					
1. Meter					
2. Test strips or cartridges, etc.					
3. Lancing device					
4. Gloves					
D. Procedure:					
1. Washes hands.					
2. Assembles supplies.					
3. Puts gloves on.					
4. Prepares lancing device.					
5. Turns meter on, checks codes (if applicable).					
6. Places strip into meter or prepares otherwise.					
7. Cleans selected area, allows to dry.					
8. Lances area.					
9. Places blood onto test strip.					
10. Places cotton ball or tissue over lanced area.					
11. Reads result.					
12. Turns meter off, removes strip.					

BG/Ketone Monitoring Skills for: Unlicensed Assistive Personnel (UAP):_____

13. Disposes of strip, gloves and other supplies appropriately.					
14. Cleans up testing area.					
15. Washes hands.					
16. Records results.					

* Place appropriate code: (+) = task performed well; (–) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

School Nurse Signature/Initials: _____ Date: _____

Unlicensed Assistive Personnel Signature/Initials: _____ Date: _____

URINE KETONE MONITORING SKILLS CHECKLIST

Unlicensed Assistive Personnel (UAP): _____

School Nurse/Instructor: _____

	Training Date/Initials	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
A. States name & purpose of procedure.					
B. Preparation:					
1. Reviews Standard Precautions.					
2. Identifies where procedure is done.					
C. Identifies supplies:					
1. Gloves					
2. Testing strips					
3. Cup of urine					
4. Protected testing area (waterproof disposable pad)					
5. Watch or clock with second hand					
D. Procedure:					
1. Washes hands.					
2. Assembles supplies.					
3. Puts on gloves.					
4. Places cup of urine on protected area (waterproof disposable pad).					
5. Dips ketone testing strip in urine taps off excess.					
6. Times appropriately.					
7. Compares strip to bottle, accurately reads results.					
8. Disposes of all supplies appropriately.					
9. Removes gloves and disposes.					
10. Washes hands.					
11. Records results.					

* Place appropriate code: (+) = task performed well; (–) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

School Nurse Signature/Initials: _____ Date: _____

Unlicensed Assistive Personnel Signature/Initials: _____ Date: _____

CALCULATING INSULIN BOLUS DOSE BASED ON CARBOHYDRATE INTAKE

Unlicensed Assistive Personnel Signature/Initials & Date (UAP): _____

School Nurse/Instructor Signature/Initials & Date: _____

	Training Date/Initials	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
A. States name & purpose of procedure.					
B. Preparation:					
1. Reviews student's DMMP for student specific instructions.					
2. Reviews standard precautions.					
3. Identifies student's ability to participate in calculations.					
C. Identifies supplies:					
1. Carbohydrate Table/ Nutrition Label (15 gm = 1 carb serving)					
2. Pencil/pen paper					
3. Calculator (optional)					
D. Procedure:					
1. Describes time when bolus insulin usually given.					
2. Verifies the student's insulin to carbohydrate ratio order.					
3. Correctly identifies the number of grams/servings of carbohydrate intake.					
4. Demonstrates correct calculation of bolus insulin dose for carbs.					
5. Verifies the student's correction factor insulin scale order.					
6. Demonstrates correct calculation of correction factor insulin dose.					
7. Correctly demonstrates the calculation of the total insulin dose.					

Adapted from: *Nursing Guidelines for the Delegation of Care for Students with Diabetes in Florida Schools*, 2003. P.65-68.

INSULIN ADMINISTRATION: SYRINGE SKILLS CHECKLIST

Unlicensed Assistive Personnel (UAP): _____

School Nurse/Instructor: _____

	Training Date/Initial	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
A. States name & purpose of procedure.					
B. Preparation:					
1. Reviews Standard Precautions.					
2. Identifies where procedure is done.					
3. Identifies expiration date of insulin					
C. Identifies supplies:					
1. Gloves					
2. Insulin bottle					
3. Syringe					
4. Alcohol wipe and cotton ball					
5. Sharps container					
D. Procedure:					
1. Washes hands.					
2. Gathers supplies (insulin bottle, syringe, alcohol wipe, cotton ball).					
3. Puts gloves on.					
4. Wipes top of bottle with alcohol wipe and lets dry for a few seconds.					
5. Pulls the plunger down to let ___ units of air into the syringe.					
6. Pushes the needle through the center of the rubber top of the insulin bottle.					

* Place appropriate code: (+) = task performed well; (-) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

INSULIN ADMINISTRATION: SYRINGE SKILLS CHECKLIST

	Training Date/Initial	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
7. Pushes the air into the bottle and leaves the needle in the bottle.					
8. Turns the insulin bottle and syringe upside down					
9. Pulls the plunger down slowly to the correct number of units.					
10. Looks for air bubbles, taps the syringe to raise air bubbles to the top. Pushes the air bubbles back in the bottle and repeats Step 8.					
11. Checks to make sure ____ units of insulin are in the syringe and removes the syringe from the bottle.					
12. Assists the student in choosing the injection site.					
a. Pinches skin and inserts insulin syringe and needle.					
b. Pushes plunger in to deliver insulin and counts to five with skin pinched and needle in place.					
c. Let go of pinched skin but keeps needle in place in skin and counts to five.					
d. Removes insulin needle from skin. Gentle pressure with cotton ball as needed.					
14. Disposes of syringe in sharps container. Does not recap syringe.					

* Place appropriate code: (+) = task performed well; (-) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

School Nurse Signature/Initials: _____ Date: _____

Unlicensed Assistive Personnel Signature/Initials: _____ Date: _____

INSULIN ADMINISTRATION: PEN DEVICE SKILLS CHECKLIST

Unlicensed Assistive Personnel (UAP): _____

School Nurse/Instructor: _____

	Training Date/Initial	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
A. States name & purpose of procedure.					
B. Preparation:					
1. Reviews Standard Precautions.					
2. Identifies where procedure is done.					
3. Identifies expiration date of insulin					
C. Identifies supplies:					
1. Gloves					
2. Insulin pen					
3. Insulin cartridge					
4. Pen needle					
5. Alcohol wipe and cotton Ball					
D. Procedure:					
1. Washes hands.					
2. Gathers supplies (insulin pen or cartridge, pen needle, alcohol wipe, cotton ball).					
3. Puts gloves on.					
4. Load insulin cartridge, if needed and wipe insulin pen top with alcohol wipe.					
5. Screws the needle onto the end of the insulin pen. Removes caps and sets outer cap on flat surface.					
6. Primes the needle by dialing the pen to 2 units.					
7. Pushes the plunger until a small drop or stream of insulin is seen, and repeats as needed.					

* Place appropriate code: (+) = task performed well; (-) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

INSULIN ADMINISTRATION: PEN DEVICE SKILLS CHECKLIST

Unlicensed Assistive Personnel (UAP): _____

School Nurse/Instructor: _____

	Training Date/Initial	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
8. Turns the dose knob to the dose ordered.					
9. Assists the student in choosing the injection site.					
e. Pinches skin and inserts insulin pen needle.					
f. Pushes injection button down completely to deliver insulin and counts to five with skin pinched and needle in place					
g. Let go of pinched skin but keeps needle in place in skin and counts to five.					
h. Removes insulin needle from skin. Dabs with cotton ball if needed.					
10. Carefully replaces the outer cap of the needle without touching the outer cap, unscrews the needle and disposes of properly in a sharps container.					

* Place appropriate code: (+) = task performed well; (-) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

_____ _____

School Nurse Signature/Initials: Date:

_____ _____

Unlicensed Assistive Personnel Signature/Initials: Date:

GLUCAGON INJECTION SKILLS CHECKLIST

Unlicensed Assistive Personnel (UAP):_____

School Nurse/Instructor:_____

	Training Date/Initial	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
A. STATES NAME & PURPOSE OF PROCEDURE					
B. PREPARATION:					
1. Reviews standard precautions					
2. Identifies procedure is done if severe hypoglycemia					
3. Identifies expiration date of glucagon					
4. Identifies accompanying steps:					
• Send someone to call EMS/911, notify school nurse & parent/guardian					
• Maintain open airway					
• Give glucose gel in buccal pouch (if ordered)					
• Give glucose source when student is awake and able to swallow					
• Remain with student until EMS arrive					
C. IDENTIFIES SUPPLIES:					
1. Glucagon kit					
2. Alcohol wipe & cotton ball					
3. Sharps container					
4. Gloves					
D. PROCEDURE					
1. Washes hands					
2. Gathers supplies (glucagon kit, alcohol wipe, cotton ball, gloves)					
3. Puts on gloves					
4. Removes flip-off seal from vial of glucagon powder, wipe with alcohol wipe					
5. Removes needle cover from syringe.					

* Place appropriate code: (+) = task performed well; (-) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

GLUCAGON INJECTION SKILLS CHECKLIST

Unlicensed Assistive Personnel (UAP):_____

School Nurse/Instructor:_____

	Training Date/Initial	Return Demonstrations			
		Date/Initial*	Date/Initial*	Date/Initial*	Date/Initial*
6. Injects entire contents of syringe into vial of glucagon powder (held upright).					
7. Swirls vial gently until dissolved/clear.					
8. Holds vial upside down, and withdraw all solution from the vial into syringe.					
9. Withdraws needle from vial, hold syringe upright, and remove air/bubbles from syringe.					
10. Exposes injection site (upper, out area of thigh, arm).					
11. Holds syringe safely; use other hand to clean injection site with alcohol wipe.					
12. For subcutaneous injection only: "Pinches up skin/tissue (still holding alcohol wipe).					
13. For subcutaneous and intramuscular injection: Inserts needle straight into tissue of injection site and inject glucagon.					
14. Withdraws needle and press gently with alcohol wipe or cotton ball at injection site.					
15. Turns child on side.					
16. Puts used syringe and vial in sharps container.					
14. Documents per school policy.					

* Place appropriate code: (+) = task performed well; (-) = task not performed well

Adapted with permission from National Association of School Nurses, 2011

_____ _____

School Nurse Signature/Initials: Date:

_____ _____

Unlicensed Assistive Personnel Signature/Initials: Date:

Appendix E

DIABETES SUPPLIES FOR SCHOOLS

According to the NDEP (2010, p. 94), parents are responsible for providing the school all the diabetes supplies and equipment needed in the DMMP. The following is a list of typical supplies:

Insulin:

- Insulin and insulin administration supplies
  - Insulin bottle and/or pen with cartridges
  - Insulin syringes/pen needles
  - Alcohol wipes/antiseptic wipes (optional)
- Pump supplies
  - Including equipment needed to change reservoir and infusion set, manufacturer's operating instructions, and extra batteries

Blood Glucose Monitoring Supplies:

- Blood glucose meter and manufacturer's instructions[i]
- Test strips (with code information, if needed)
- Finger-sticking device
- Lancets
- Cotton balls
- Logbook to record blood sugar and amounts of insulin
- Protective covering (e.g., plastic wrap) as needed

Food:

- Snack foods
- Choices for Physical activity - 15 grams carbohydrate:
  - 1 – 4ounce juice box
  - 1 cup Gatorade
  - 1 sliced orange or apple
  - 1 small box raisins
  - 6 saltines
  - 1 cup light yogurt
  - ¾ cup dry cereal
- Choices for Physical activity - 30 grams carbohydrate:
  - 1 cereal bar
  - 1 – 8 ounce juice box
  - 2 slices bread
  - 1 small bagel
- Choices for Physical activity - 45-50 grams carbohydrate plus protein
  - 1 sports nutrition bar

    - 1 Package (6) cheese or peanut butter sandwich crackers plus 4 oz. juice
- Protein Sources:
    - Peanut butter
    - Sliced or String Cheese
    - Lunch Meat
    - Egg
    - Peanuts, Walnuts, or Almonds

Low blood sugar (hypoglycemia) supplies:

- Quick-acting glucose products
    - 3-4 glucose tablets
    - 15 grams glucose gel
    - 6 oz. regular soda
    - 4 oz. juice (unsweetened)
    - 3 tsp. sugar in water
    - 3 tsp. jelly, syrup, or honey
- Glucagon emergency kit

Appendix F

Sample Blood Glucose Management Algorithms

LOW BLOOD GLUCOSE (HYPOGLYCEMIA) EMERGENCY CARE PLAN

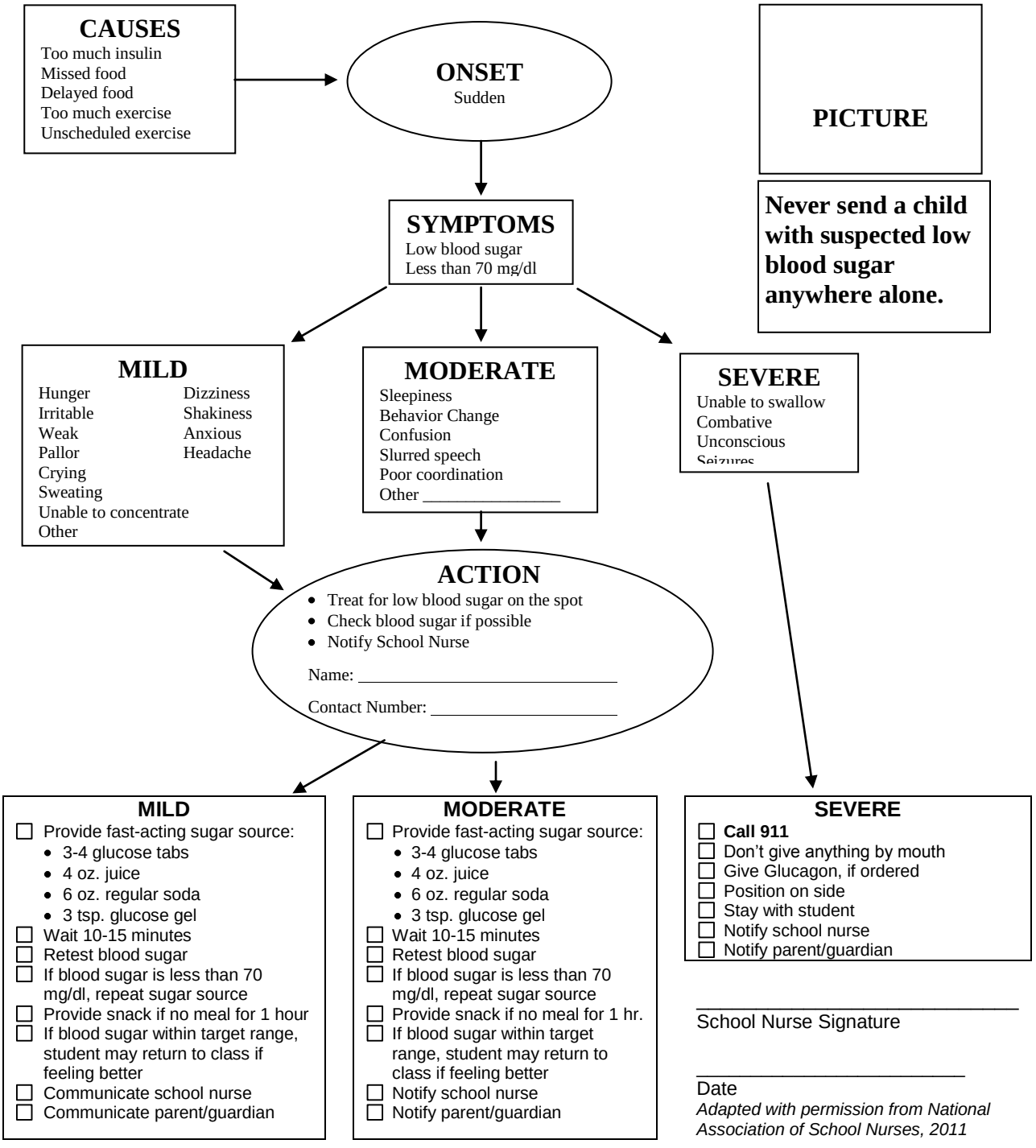
Student Name: _____ Date: _____

Grade/Teacher: _____ School Year/Date & School: _____

Parent/Guardian Name: _____ Phone: (___) _____

Emergency Contact: _____ Phone: (___) _____

Health Care Provider: _____ Phone: (___) _____



_____

School Nurse Signature

_____

Date

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HIGH BLOOD GLUCOSE (HYPERGLYCEMIA) MANAGEMENT ALGORITHM

Student Name: _____
Grade/Teacher: _____
School Year/Date & School: _____

PICTURE

CAUSES
Too much food
Too little insulin
Decreased activity
Illness, infection
Stress

→ **ONSET**
Over time-hours or days

Early Symptoms: **BG≥** _____	**Symptoms progressively become worse:**
Thirst/dry mouth	Sweet breath
Frequent urination	Facial flushing
Fatigue/sleepiness	Dry, warm skin
Increased hunger	Nausea/stomach pains
Blurred vision	Vomiting
Lack of concentration	Weakness
	Confusion
	Labored breathing
	Unconsciousness/coma

ACTION NEEDED

Check student's IHP for order to check blood glucose, check ketones, give insulin.

IF STUDENT IS FEELING OK
- □ Provide water if student is thirsty.
- □ Allow liberal bathroom privileges.
- □ May resume classroom activities.
- □ Communicate with school nurse and notify parent/guardian.

IF STUDENT IS NOT FEELING WELL
- □ Call parent/guardian to pick up student.
- □ Provide water if student is thirsty.
- □ Provide additional treatment per IHP (ketone check, insulin).
- □ Notify school nurse if there are further immediate concerns or questions.
- □ Document action and provide copy to school nurse.

FOR VOMITING WITH CONFUSION, LABORED BREATHING AND/OR COMA
- □ Call 911
- □ Contact school nurse
- □ Notify parent/guardian.

School Nurse Signature:_____

Date: _____

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School & School Year:

_____

School Nurse Signature & Date:

_____

Algorithm for Managing Blood Sugar Results
Obtain Blood Glucose Reading

Student Name:_____ Grade/Teacher_____

PICTURE

Below 70

1. Give Fast acting sugar source*.
2. Observe for 10-15 minutes.

3. Retest blood glucose, if less than 70 repeat sugar source according to procedure. If ordered, give carbohydrate and protein snack (e.g., crackers and cheese) or send to lunch early

4. Notify parent/guardian
5. Notify school nurse if two or more episodes in one week

6. If Student Becomes Unconscious, Seizures, or is Unable to Swallow:
   a. Call 911
   b. Turn student on side to ensure open airway.
   c. Administer glucagon as prescribed.
   d. Notify school nurse and parent/guardian

70 – _____

1. If 70 or above the student feels OK, may resume school activities. Provide treatment according to orders.

2. If 70 or above and student is feeling "low," retest immediately. Give fast acting sugar source. Wait 10-15 minutes. Retest blood glucose. If ordered, give carbohydrate and protein snack.

Above _____

If Student Feels OK
Ketones Negative or Trace Small

1. Provide water if student is thirsty and/or has dry mucous membranes.
2. Provide free access to the bathroom
3. Provide additional treatment per IHP (e.g., insulin administration, ketone check, activity restriction.)
4. May resume classroom activities.
5. Document action and provide copy to school nurse.
6. Inform parent/guardian
7. If pump, additional attention required, (e.g., filling of reservoir, changing set, Insulin administration.)
8. Recheck blood glucose and ketones if symptoms persist.

Student Does Not Feel OK
Ketones Moderate to Large

1. Call parent/guardian.
2. Provide water if student is thirsty and/or has dry mucous membranes.
3. Provide free access to the bathroom
4. Provide additional treatment per IHP (e.g., insulin administration, ketone check, activity restriction.)
5. If pump, additional attention required, (e.g., filling of reservoir, changing set, insulin administration.)
6. Notify school nurse if there are further immediate concerns or questions. Document action and provide copy to school nurse.
7. Recheck blood glucose and ketones if symptoms change while waiting for parent/guardian or 911
8. FOR VOMITING WITH CONFUSION, LABORED BREATHING AND/OR COMA
- **Call 911**
- **Notify parent/guardian**
- **Contact school nurse**

* Fast Acting Sugar Sources

- 3-4 glucose tablets
- 15 grams glucose gel
- 6 oz. regular soda
- 4 oz. juice (unsweetened)
- 3 tsp. sugar in water
- 3 tsp. jelly, syrup, or honey

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