

Appendix 5 – Staff Training Resources

610-X-7-.10 Delegation Of Insulin And Glucagon Administration In The School Setting.

(1) **DEFINITIONS**

(a) **Glucagon:** a hormone that raises the level of glucose in the blood and is administered by injection to individuals to treat severe hypoglycemia that is indicated by the inability to eat food or drink, unconsciousness, unresponsiveness and/or seizures or convulsions.

(b) **Insulin:** a hormone made and released by the pancreas that allows glucose to enter the cells where it is used for energy. Students with type 1 diabetes and some students with type 2 diabetes need to administer insulin at regular times and take insulin to cover carbohydrate intake to correct hyperglycemia.

(c) **Medication Administration and Safety:** See Chapter 610-X-6-.07.

(d) **School setting:** preschool through 12th grade in a public or private school or school activity sponsored by such a school, in which the student is a direct participant.

(e) **Trained, Unlicensed Medication Assistant:** a school employee who volunteers to receive delegation of administration of insulin and glucagon in the school setting and receives the approved training.

(2) **GENERAL PRINCIPLES**

(a) The injection of insulin or glucagon is a nursing task that may be delegated in accordance with the requirements of Act 2014-437 and the student's individualized health plan (IHP). The selection of the type of insulin and dosage levels shall not be delegated.

(b) An Individualized Health Plan (IHP) shall be developed for any student diagnosed with diabetes who is in the school setting as provided for in Alabama Act No 2014-437.

(c) Delegation of tasks for students with diabetes shall be confined to procedures that do not require nursing assessment, judgment, evaluation, or complex skills.

(d) Factors the school nurse shall consider and may include in the IHP are:

1. Age of onset and current age of student with diabetes
2. Recent hospitalization
3. Most recent hemoglobin A1C (HgA1C)
4. Recent change in type of insulin, delivery method, and dosage
5. If and when glucagon was required
6. Comorbidities or other chronic illnesses
7. Participation in sports or other school-sponsored activities
8. Orders from a legally authorized prescriber
9. Carbohydrate counting
10. Blood glucose monitoring
11. Activation or suspension of an insulin pump
12. Usage of insulin pens
13. Self-administration evaluation
14. Student's comprehension and adherence to treatment
15. Parental comprehension and adherence to treatment
16. Emergency protocol related to glucagon administration
17. Student's overall health needs
18. Insulin to carbohydrate ratios and correction factors
19. Symptoms and treatment of hypoglycemia and hyperglycemia

20. Ketone testing

(e) Teaching school personnel about diabetes does not constitute delegation.

(f) Insulin and glucagon administration delegation is limited to:

1. The student's Individual Health Plan,
2. Trained, Unlicensed Medication Assistants who have received training and competency validation for each student assigned to them.
3. Specific students
4. Specific identified time frame

(g) The delegation shall include documentation of administration of glucagon and insulin and appropriate reporting to the school nurse.

(h) If the local education agency determines that school nurses shall provide the care to students with diabetes, delegation may not be required.

(3) **PROCEDURE**

(a) The school nurse shall validate the competency of the trained, unlicensed medication assistant to whom delegation of administration of insulin and glucagon is given

(b) Insulin injection by the Trained, Unlicensed Medication Assistant receiving the delegation shall only occur when consistent with the IHP.

(c) Dosages of insulin may be injected by the Trained, Unlicensed Medication Assistant as designated in the IHP.

(d) Non-routine and /or large, correction dosages of insulin may be given by the Trained, Unlicensed Medication Assistant only after consulting with the school nurse, parent or guardian, as designated in the IHP and after verifying and confirming the type and dosage of insulin being injected.

(e) When the student is not capable of self-administration, routine daily meal boluses (routine correction dosages) of insulin, based on carbohydrate counts and blood glucose levels, may be administered by the Trained, Unlicensed Medication Assistant as designated in the IHP.

(f) Training of the Trained, Unlicensed Medication Assistants shall occur prior to any delegation of administration of glucagon and insulin.

(g) The school nurse shall follow the training guidelines developed by the State Department of Education in consultation with the Alabama Board of Nursing.

(h) The local education agency, in consultation with the school principal, shall identify any volunteer in each school to the school nurse for possible training.

(i) An annual report of the number of Trained, Unlicensed Medication Assistants in each school and the delegation of administration of insulin and glucagon to specific Trained, Unlicensed Medication Assistants shall be provided to the Board of Nursing by the Lead Nurse of each school system.

Author: Alabama Board of Nursing

Statutory Authority: Code of Ala. 1975, §34-21-2(c)(21).

History: New Rule: Filed March 13, 2015; effective April 17, 2015.

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DIABETES CARE TASKS AT SCHOOL: What Key Personnel Need to Know



**INSULIN BY SYRINGE
AND VIAL**

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Goal: Optimal Student Health and Learning



Accurate and timely insulin dosing is a vital piece of a comprehensive plan.

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Learning Objectives

Participants will be able to understand:

- *Types of syringes*
- *Where on the body to inject insulin*
- *Preparation steps for syringe injection*

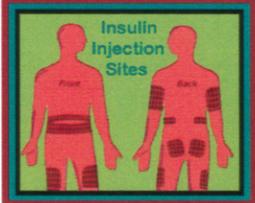
Participants will be able to demonstrate:

- *How to dose with a syringe*
- *How to inject with a syringe*

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On Target!

- Inject into fat layer under skin
- Rotate sites
- Student should choose site

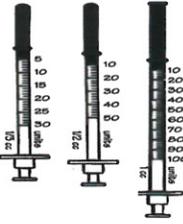
• Common sites: abdomen, thigh buttocks, upper arms

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Insulin Syringes

- Sizes – 30, 50, 100 units
- Disposal
 - *Do not reuse*
 - *Do not recap*



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Syringe & Vial: Preparation

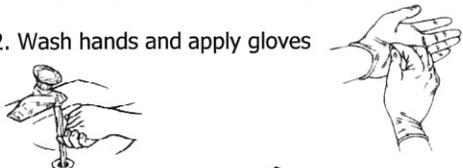
1. Get Supplies
 - *Insulin (Verify type of insulin)*
 - *Syringe*
 - *Alcohol wipe*
 - *Disposable gloves*
 - *Sharps container*



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Syringe & Vial: Preparation

2. Wash hands and apply gloves 
3. Clean the insulin vial 

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Syringe & Vial: Preparation

4. Have student select injection site 
5. Clean the injection site 

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Syringe & Vial: Preparation

6. Check the insulin dose 
7. Remove the cap from syringe 

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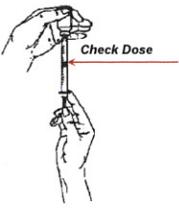
Syringe & Vial: Dosing

8. Pull the plunger down to number of units to be administered 
9. Inject air into bottle 

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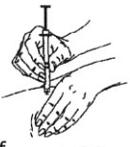
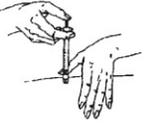
Syringe & Vial: Dosing

10. Draw out prescribed number of units of insulin as per DMMP 

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Syringe & Vial: Injecting

11. Pinch up the skin 
12. Push needle into skin at 90°
13. Release pinch
14. Push the plunger in
15. Count to "5"
16. Remove needle and dispose of syringe 
17. Document time, dosage, site, and blood glucose value

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DIABETES CARE TASKS AT SCHOOL: What Key Personnel Need to Know



INSULIN BASICS

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Goal: Optimal Student Health and Learning



Accurate and timely insulin dosing is a vital piece of a comprehensive plan.

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Learning Objectives

Participants will be able to understand:

- *What insulin does*
- *Types of insulin*
- *Insulin delivery methods*
- *Storing insulin*
- *Factors that influence insulin dosing*

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Vocabulary

Target Range: A range of numbers that represents an individual's ideal blood glucose level; determined by health care team with the individual (child with diabetes and parent/guardian)

Basal Insulin: Sometimes called "background" insulin, the insulin working steadily throughout the day

Bolus Insulin: a single dose of insulin, given for one of two reasons:

- **Carb or Meal/Snack Bolus:** Insulin dosed when food is eaten
- **Correction Bolus:** Insulin dosed when blood glucose level is too high and needs to be corrected (made lower)

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Insulin in Schools Today

- Most students need to take insulin in school
- Insulin dosing varies from student-to-student and changes over time
- Student's need for assistance will vary as the student progresses in self-management
- Insulin dosing and timing will be specified in the DMMP; physician orders may include provisions for the parent/guardian and/or capable students to modify dosing
- Specific school procedures for administration should be documented

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What is Insulin?

Insulin is a hormone that is necessary:

- *Moves glucose from blood into cells for energy*

Students with type 1 diabetes do not produce insulin

Without enough insulin, high blood glucose results:

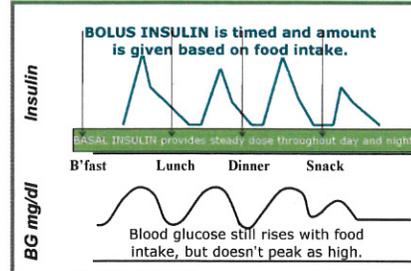
- *Energy levels are low*
- *Dehydration*
- *Complications*

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Insulin Delivery Methods

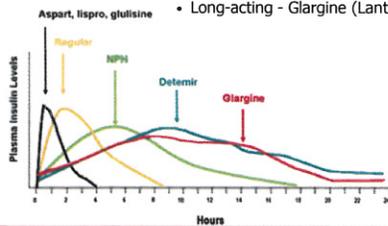
- Insulin Syringe
- Insulin Pen
- Insulin Pump or Pod
- Jet Injector

Basal and Bolus Insulin



Insulin Types

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



Storing Insulin

- Review the product storage instructions and check the expiration date
- Generally store at room temperature less than 86 degrees
- Refrigerate unopened vials and insulin pens
- Be careful NOT to freeze

When to Give Insulin

DMMP should specify dosing clearly

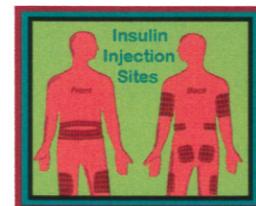
Generally:

- Before meals or snacks
- For blood glucose levels significantly above target range
- For moderate or large ketones

Where to Give Insulin: On Target!



- Inject into fat layer under skin
- Rotate sites
- Student should choose site



- Common sites: abdomen, thigh buttocks, upper arms

Dosing Insulin at School

Generally, students will only take rapid or short acting insulin at meal or snack times:

- Some students will use a standing insulin dose
- Others will have a varied dose, depending upon:
 - *what food is eaten (carb bolus)*
 - and/or
 - *whether blood glucose is within the target range (correction bolus)*

Carb Bolus to Cover Meals, Snacks

The insulin to carb ratio varies student to student, is specified in the DMMP:

- **Recorded** as 1 unit insulin per X gms of carb
- **Example:** 1:10 ratio; 1 unit of insulin for every 10 grams of carb eaten
- **Calculate:** Meal of 60 grams CHO
 - $60/10 = 6$
 - 6 units of insulin are needed to cover this meal

Correction Bolus to Lower Blood Glucose

Amount to lower blood glucose to target, usually calculated by sliding scale or correction factor:

- **Sliding scale:** give units of insulin for each interval of BG
 - Example: 1 unit 150-200, 2 units 201-250, 3 units 250+
- **Correction factor:** Blood glucose level – target blood glucose/correction factor = units insulin to be given
 - Example: $BG=150$ (actual) minus Target BG (100) = 50 divided by Correction factor (50) = 1 unit insulin needed

Insulin Bolus for Both Carbs and Correction

- For some students, dosing at meal time may include both a carbohydrate ratio dose and a correction dose
- Total dose = Carb ratio dose + Correction dose
- If student's blood glucose is below target range, the correction may mean giving less than the usual dose

After Giving Insulin

- Check site for leakage
- Document on log sheet
- Correction doses:
 - Retest per DMMP to check effectiveness
- Meal/snack doses:
 - Timeliness in relation to eating
 - Supervision of food amount per DMMP

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DIABETES CARE TASKS AT SCHOOL: What Key Personnel Need to Know



HYPERGLYCEMIA

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Goal: Optimal Student Health and Learning



Managing hyperglycemia is a vital piece of a comprehensive plan.

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Learning Objectives

Participants will be able to understand:

- *Symptoms of high blood glucose*
- *Treatment of high blood glucose*
- *Prevention of high blood glucose*
- *Short and long-term risks and complications*

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Vocabulary

Hyperglycemia - too high a level of glucose in the blood

Ketones - (ketone bodies) Chemicals that the body makes when there is not enough insulin in the blood and the body must break down fat for its energy

Diabetic ketoacidosis (DKA) - An acute metabolic complication of diabetes characterized by excess acid in the blood which can be life threatening

Ketone testing - a procedure for measuring the level of ketones in the urine or blood

Glucose - a simple sugar found in the blood. The fuel that all body cells need to function

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HYPERglycemia = HIGH Glucose (Sugar)

Onset:

- Usually slow to develop to severe levels
- More rapid with pump failure/malfunction, illness, infection
- Can mimic flu-like symptoms
- Greatest danger: may lead to diabetic ketoacidosis (DKA) if not treated

DMMP will specify signs and action steps at each level of severity:

- Mild
- Moderate
- Severe

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Hyperglycemia: Possible Signs & Symptoms



Severe Symptoms	
Labored breathing	Confusion
Profound weakness	Unconscious
Moderate Symptoms	
Dry mouth	Vomiting
Stomach cramps	Nausea
Mild Symptoms	
Lack of concentration	Thirst
Frequent urination	Flushing of skin
Sweet, fruity breath	Blurred vision
Weight loss	Increased hunger
Stomach pains	Fatigue/sleepiness

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Hyperglycemia: Risks & Complications

- Hyperglycemia, which if untreated can lead to DKA and potentially to coma and/or death (mainly in type 1)
- Interferes with a student's ability to learn and participate
- Serious long-term complications develop when glucose levels remain above target range over time or are recurring

Hyperglycemia: What to do

Goal: *lower the blood glucose to target range.*

Action steps, following DMMP

- Verify with blood glucose check
- Check ketones
- Allow free use of bathroom and access to water
- Administer insulin
- Recheck blood glucose
- Call parent/guardian
- Note any patterns, communicate with school nurse and/or parent/guardian

Hyperglycemia: Possible Causes

- Late, missed or too little insulin
- Food intake exceeds insulin coverage
- Decreased physical activity
- Expired or improperly stored insulin
- Illness, injury
- Stress
- Other hormones or medications
- Hormone fluctuations, including menstrual periods
- Any combination of the above

Hyperglycemia: Prevention

- **Timing** is very important – stick to the schedules:
 - Meal time, insulin administration, physical activity
- **Accuracy** is very important
 - Insulin dose, monitoring the amount and type of food eaten
- **Changes** should only be made after consultation with the parent/guardian and/or school nurse
 - Snack, meal, or insulin or physical activity times or amounts

Information for Teachers

- Students with hyperglycemia or hypoglycemia often do not concentrate well
- Students should have adequate time for taking medication, checking blood glucose, and eating
- During academic testing, provide accommodations as per 504 plan or IEP
 - Check blood glucose before and during testing, per plan
 - Access to food/drink and restroom
 - If a serious high or low blood glucose episode occurs, students should be excused with an opportunity for retake

"Make the Right Choice the Easy Choice"

Eliminate barriers to diabetes management:

- Become familiar with and following students' written plans
- Eliminate barriers to:
 - snacking
 - blood glucose checks
 - access to water and bathrooms
 - insulin administration
- Avoid "good or bad" judgments based on individual blood glucose readings
- Communicate with parent/guardian and school nurse



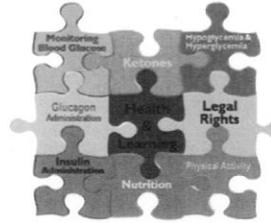
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DIABETES MEDICAL
MANAGEMENT PLAN

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Goal: Optimal Student Health and Learning



Each student should have a Diabetes Medical Management Plan (DMMP) as the foundation for all school-based care.

Learning Objectives

Participants will be able to understand:

- *Why the Diabetes Medical Management Plan is important*
- *What other kinds of plans are most often used*
- *The purpose, content, and person(s) responsible for each kind of plan*

Diabetes Medical Management Plan (DMMP)

- Basis for all school-based diabetes care plans
- Developed by the student's personal health care team and parent/guardian and signed by a member of student's personal health care team
- Individualized
- Implemented collaboratively by the school diabetes team:
 - school nurse
 - the student
 - parent/guardian
 - other school personnel

DMMP Information

- Emergency contact information
- Level of self-care
- Blood glucose monitoring
- Insulin/medication administration
- Glucagon administration
- Meal and snack schedule
- Physical activity and sports
- Recognition and treatment of hypoglycemia and hyperglycemia

Other Written Plans

- Section 504 Plan
- Individualized Education Program (IEP)
- Individualized Health Care Plan (IHP)
- Quick Reference Emergency Plan

Needs Addressed by 504 Plan/IEP

- Location and timing of blood glucose monitoring and insulin administration
- Identity of trained diabetes personnel
- Location of diabetes supplies
- Free access to water and restroom
- Nutritional needs, meals and snacks
- Full participation in all school-sponsored activities
- Access to blood glucose checks and treatment supplies during exams
- Alternative times for academic exams if student is experiencing hypoglycemia or hyperglycemia
- Absences without penalty for doctors' appointments and diabetes-related illness
- Maintenance of confidentiality and student's right to privacy

Individualized Health Care Plan (IHP)

- The school nurse may develop to implement the DMMP
- Based on Diabetes Medical Management Plan (DMMP) or "medical/physician's orders"
- Communicates the nursing management strategies for the student in the school setting

Quick Reference Emergency Plan

- Summarizes to how to recognize and treat hypoglycemia and hyperglycemia
- Based on information from DMMP
- Distributed to all personnel who have responsibility for student with diabetes



Written Plans for Diabetes Management

Plan	What it covers	Who writes it
DMMP	<i>Doctor's Orders</i> - details all aspects of routine and emergency diabetes care.	Personal health care team
504 Plan	<i>Education plans</i> - details both health care and educated related aids, services, accommodations, and special education services the student needs.	504 team
IEP		IEP team
IHP	<i>School nursing care plan</i> - specifies how diabetes care as prescribed in the DMMP will be delivered in the school	School nurse
Quick Reference Emergency	<i>Tool for school staff</i> - how to recognize and treat hypoglycemia or hyperglycemia	School nurse

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DIABETES BASICS

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What is Diabetes?

In diabetes:
Body does not make or properly use insulin

Insulin is needed to:
Move glucose from blood into cells for energy

If insulin isn't working, high blood glucose results:
*Energy levels are low
Dehydration
Complications*

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Goal: Optimal Student Health and Learning

All school staff members should have basic knowledge of diabetes and know who to contact for help.

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Type 1 Diabetes

- Autoimmune disorder
- Insulin-producing cells destroyed
- Daily insulin replacement necessary
- Age of onset: usually childhood, young adulthood
- Most common type of diabetes in children and adolescents

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Learning Objectives

Participants will be able to understand:

- *What is diabetes?*
- *Why care at school is required*
- *Basic components of diabetes care at school*
- *Short and long term consequences of diabetes*

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Type 1 Diabetes

ONSET: relatively quick

SYMPTOMS: increased urination, tiredness, weight loss, increased thirst, hunger, dry skin, blurred vision

CAUSE: uncertain, both genetic and environmental factors

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Type 2 Diabetes

Insulin resistance – first step

Age at onset:

- Most common in adults
- Increasingly common in youth
 - overweight
 - inactivity
 - genes
 - ethnicity

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Diabetes Management Constant Juggling - 24/7

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Type 2 Diabetes

ONSET: variable timeframe for children

SYMPTOMS: tired, thirsty, hunger, increased urination

- some children show no symptoms at diagnosis
- others are symptomatic with very high blood glucose levels

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Diabetes Management

Routine Care:

- Many students will be able to handle all or almost all routine diabetes care by themselves
- Some students will need school staff to perform or assist with routine diabetes care

Emergency Care:

- ALL students with diabetes will need help in the event of an emergency situation

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Diabetes is Managed, But it Does Not Go Away.

GOAL:
Maintain target blood glucose

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Care in the Schools: School Nurses and Others

A School nurse is most appropriate to:

- Coordinate diabetes care
- Supervise diabetes care
- Provide direct care (when available)
- Communicate about health concerns to parent/guardian and health care team

However, a school nurse is not always available.

Non-medical school staff can be trained to assist students:

- For both routine and emergency care
- Including insulin and glucagon administration

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Diabetes Medical Management Plan (DMMP)

- Basis for all school-based diabetes care plans
- Developed by student's personal health care team and parent/guardian
- Signed by a member of student's personal health care team
- Individualized
- Implemented collaboratively by the school diabetes team:
 - *School nurse*
 - *Student*
 - *Parent/guardian*
 - *Other school personnel*

Where to Get More Information

American Diabetes Association

1-800- DIABETES

www.diabetes.org

National Diabetes Education Program/NIH

www.ndep.nih.gov

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BLOOD GLUCOSE MONITORING

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Goal: Optimal Student Health and Learning



Blood glucose monitoring (BGM) is a vital piece of a comprehensive management plan.

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Learning Objectives

Participants will be able to understand:

- *Why blood glucose is monitored*
- *When blood glucose should be monitored*
- *How to perform a blood glucose check*
- *Required equipment*

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Blood Glucose Monitoring

GOAL:

- maintain blood glucose within target range

IMMEDIATE BENEFIT:

- maximize learning and participation
- identification, treatment, and prevention of lows and highs

LONG-TERM BENEFIT:

- decrease risk of long-term complications
- maximize health

CHALLENGE:

- many variables impact blood glucose

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Role of the School

In accordance with DMMP:

- Facilitate blood glucose monitoring
- Act on blood glucose check results
- Document results of blood glucose monitoring when assistance or supervision is provided
- Communicate blood glucose results to parent/guardian or school nurse to monitor for trends

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Any Time, Any Place Monitoring

For students who can self-check:

- Improved blood glucose control
- Safer for student
- Student gains independence
- Less stigma
- Less time out of class
- Assists decision making in response to result

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Blood Glucose Monitoring Technology

- Simply, easy to use
- Small meters
- Reliable results (with smaller samples)
- Options for alternate (to finger poke) site testing
- Enhanced electronic functions to record, share, and analyze data

Limitation – don't know blood glucose between checks

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Continuous Glucose Monitoring (CGM)

How it works:

- A tiny glucose-sensing device called a "sensor" is inserted just under the skin
- The sensor measures glucose in the tissue and sends the information to a pager-sized device
- The system automatically records an average glucose value every 5 minutes for up to 3, 5, or 7 days
- Finger stick pokes and regular meter needed to calibrate
- Alarms signal when glucose is out of target range

Limited, but increasing use; emerging technology

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Basic Steps

- **Know** the target range per DMMP
- **Check** at times specified in DMMP
- **Immediate Action** – Treatment to get back within target range

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When to Check?

DMMP specifies for an individual student

Regularly scheduled checks:

- Routine monitoring before meals and snacks
- Before, during and/or after physical activity

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When to Check?

Per DMMP, extra checks may be necessary:

- Hypoglycemia or hyperglycemia symptoms
- Change in diabetes management
- Periods of stress or illness
- Prior to academic tests
- Early or delayed release from school
- CGM alarms

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Lancing Devices

Lancets



MultiClix



Pen-type Lancing Devices



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Know the Meter



- Features vary:
 - Sample size
 - Wait time
 - Alternate-site testing capacity
 - Communication with other devices – pumps, continuous glucose monitors
- Become familiar with operation of meter
1-800 number on back of meter

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Preparation

1. Gather blood glucose monitoring supplies:
 - Lancet
 - Test strips
 - Meter
2. Student washes hands and dries thoroughly
3. If assisting or performing for student, put on disposable gloves




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Readying the Meter

4. Turn the meter on
5. Check code # (if required)
6. Insert a strip into the meter



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Lancing the Finger

7. Hold the lancet device to the side of the finger and press the button to stick the finger.
 - **Alternative site (per DMMP)** the school nurse and/or parent/guardian will give further instructions which sites are appropriate
 - **Note: In the case of suspected hypoglycemia, only the finger should be used for blood glucose sampling**



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Applying Blood to Strip

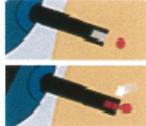
8. Follow instructions included with the meter when applying blood to strip



Drop, not smear



Cover **ALL** of test strip window



Some strips wick blood onto the strip

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Results

9. Wait until blood glucose results displayed
10. Dispose of lancet and strip
11. Record blood glucose results, take action per DMMP



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What Does the Display Mean?



- Check manual
- Contact manufacturer (1-800; Website)

What Does the Number Mean?

- Reference student's target range
 - *Individualized for student*
 - *May vary throughout day*
 - *Take action per DMMP*
- Communicate sensitively
- Recognize value may vary according to time since eating, insulin, or physical activity

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DIABETES CARE TASKS AT SCHOOL: What Key Personnel Need to Know



**NUTRITION AND
PHYSICAL ACTIVITY**

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Goal: Optimal Student Health and Learning



Managing nutrition and physical activity are vital pieces of a comprehensive plan.

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Learning Objectives

Participants will be able to understand:

- *Basic meal plans for students with diabetes*
- *Nutrition calculation methods*
- *Physical activity benefits for students with diabetes*
- *Physical activity guidelines for students with diabetes*

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Nutrition: Why be concerned?

- Good nutrition is important for everyone for optimal health
- Nutrition planning is essential for good diabetes control:
 - maintain blood glucose within target range
 - to prevent or delay complications
 - to help children and teens grow and develop properly
 - to achieve healthy weight
 - promote optimal learning

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School Nutrition Management

- Student's parent/guardian and health care team determine an individualized meal plan
- A diagnosis of diabetes does NOT always limit which foods a student can eat
- Meals & snacks need to be carefully timed to balance physical activity and insulin/medications
- Encourage healthy eating for all students

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School Nutrition Management

Students with type 2 diabetes may need additional accommodations to help manage lipids, blood pressure and weight:

- May need support at meals and snacks to achieve calorie level targets and consistent carb amounts
- Assure that healthy foods such as whole grains, low-fat protein and dairy, fruits, and vegetables are available

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Basic Meal Plans

Key: Balance insulin/medications with carb intake

- Most students have flexibility in WHAT to eat
 - *Basic Carbohydrate Counting*
 - *Advanced Carbohydrate Counting*
- Many students have flexibility in WHEN to eat
 - *More precise insulin delivery (pumps, pens)*
 - *Rapid-acting insulins*
 - *Time dosing of insulin according to DMMP*

Basic Carbohydrate Counting

- Calories from:
 - *carbohydrate*
 - *protein*
 - *fat*
- Each nutrient type affects blood glucose differently
- Carbohydrate has the biggest effect on blood glucose
- TOTAL carbohydrate matters more than the source (sugar or starch)

Advanced Carbohydrate Counting

USING THE INSULIN-TO-CARB RATIO

The insulin-to-carb ratio:

- Varies from student to student
- Is determined by the student's health care team
- Should be included in the DMMP
- Usually stated as a ratio of 1 unit of insulin to x grams carbohydrate
- May vary from meal to meal for a student

Using Insulin-to-Carb Ratio

Example: 1:10 Ratio

1 unit of insulin to be given
per 10 grams of carbohydrate eaten

60 gm meal / 10 gms = 6 units of insulin needed

School Meals & Snacks

- Provide school menus and nutrition information to student/parent/guardian in advance.
- Provide sufficient time for eating.
- Monitor actual food intake per DMMP
 - *young or newly diagnosed*
 - *picky eaters*
- Respect, encourage independence.



Nutrition Information at School

The approximate carbohydrate content of school meals can be determined in advance by the school nutrition director and can be indicated on the school menu for each item.



Beyond the Routine: School Parties

- Provide parent/guardian with advance notice of parties/special events
- Follow the student's DMMP, 504 Plan or IEP
- Some may prefer to bring their own foods, but may eat what is available.
- Provide nutritious party snacks or non-food treats for all
- Limit use of food as reward



Beyond the Routine: Field Trips

- Notify school nurse as soon as trip is scheduled to allow for consultation with parent/guardian about food and/or insulin adjustments
- Bring plenty of quick-acting sugar sources to treat hypoglycemia
- Bring lunch as appropriate
- Bring diabetes equipment and supplies, including glucagon, if specified in DMMP
- Bring list of emergency contacts, copy of emergency care plan

Activity & Diabetes

Everyone benefits from physical activity.

Students with diabetes should fully participate.

In general, activity lowers blood glucose levels.

If there is insufficient insulin, physical activity can raise blood glucose.

- May need to make adjustments to insulin/medications and food intake, per DMMP
- A quick-acting source of glucose, glucose meter, and water should always be available
- PE teachers and coaches must be familiar with symptoms of both high and low blood glucose

Activity & Blood Glucose Monitoring

Check before, during, and after physical activity per DMMP:

- Especially when trying a new activity or sport
- If blood glucose starts to fall, student should stop and have a snack or quick-acting source of sugar
- Students with pumps may disconnect or adjust the basal rate downward temporarily, prior to physical activity

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DIABETES CARE TASKS AT SCHOOL: What Key Personnel Need to Know



INSULIN BY PUMP

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Goal: Optimal Student Health and Learning



Accurate and timely insulin dosing is a vital piece of a comprehensive plan.

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Learning Objectives

Participants will be able to understand:

- *Basic types and features of insulin pumps*
- *What pumps do*
- *Essential information and skills for key school personnel who might perform or assist in entering data or delivering insulin with a pump*

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What Is an Insulin Pump?

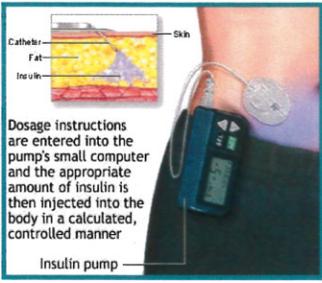
- Battery operated device about the size of a pager
- Reservoir filled with insulin
- Computer chip with user control of insulin delivery
- Worn 24 hours per day
- Delivers only rapid-acting insulin



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Dosing with an Insulin Pump



Dosage instructions are entered into the pump's small computer and the appropriate amount of insulin is then injected into the body in a calculated, controlled manner.

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Insulin Pump Therapy

- Based on what body does naturally
 - *Small amounts of insulin all the time (basal insulin)*
 - *Extra doses to cover each meal or snack (bolus insulin)*
- Precision, micro-drop insulin delivery
- Flexibility
- Ease of correction for high blood glucose levels

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What Pumps Do

"Bells and Whistles"

- Many pumps will calculate bolus dosages
- Some pumps communicate with blood glucose meters, or continuous glucose monitors
- Tracking active insulin
- Temporary basal rates

Limitations:

- Pumps rely on input from humans to calculate dosing; the user can override pump-calculated doses

What Key Personnel Need to Know About an Insulin Pump

- How to deliver routine boluses for carbs and high blood glucose
- Signs/symptoms that pump site may need to be changed
- When an injection by pen or syringe is indicated
- How to disconnect or "suspend" the pump
 - *in event the student becomes unconscious or seizes or*
 - *if instructed by the parent/guardian or diabetes care provider, e.g. during P.E.*

Sampling of Pumps



Pump Supplies at School

- Infusion set
- Reservoir
- Insulin
- Skin prep items
- Alcohol wipes
- Syringe (in case of malfunction)
- Pump batteries
- Inserter (if used)
- Manufacturers manual, alarm card

In cases where the pump is disconnected (for example in PE) it should be placed in a secure place as designated in the student's written plan.

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DIABETES CARE TASKS AT SCHOOL: What Key Personnel Need to Know



INSULIN BY PEN

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Goal: Optimal Student Health and Learning



Accurate and timely insulin dosing is a vital piece of a comprehensive plan.

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Learning Objectives

Participants will be able to understand:

- *Types of insulin pens*
- *Where on the body to inject insulin*
- *Preparation steps for insulin pen injection*

Participants will be able to demonstrate:

- *How to dose with an insulin pen*
- *How to inject with an insulin pen*

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Insulin Pens

- Techniques for dosing and insulin delivery are similar for both types of pen devices:
 - *Prefilled pens*
 - *Reusable (cartridge) pens*
- Both long-acting or basal insulin and rapid-acting or bolus insulin are available in pens
- Most students will only take rapid-acting or bolus insulin in school

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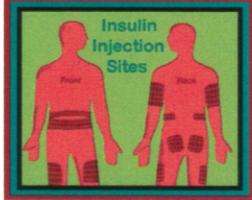
Where to Give Insulin: On Target!



• Inject into fat layer under skin

• Rotate sites

• Student should choose site



• Common sites: abdomen, thigh buttocks, upper arms

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Insulin Pen: Preparation

1. Gather supplies. Verify insulin type
 - *pen device (with cartridge)*
 - *pen needle*
 - *alcohol wipe*
 - *sharps container*
2. Wash hands
3. Apply gloves
4. Have student choose injection site
5. Clean injection site
6. Screw on pen needle



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Insulin Pen: Dosing

7. Prime: Dial "2" units. *If the pen is being used for the first time, prime 4-6 units as per manufacturer's instruction*
8. Hold upright. Remove air by pressing the plunger. *Repeat "Prime" if no insulin shows at end of needle*
9. Dial number of units to be administered as per DMMP

Insulin Pen: Injecting

10. Pinch up the skin
11. Push the needle into the skin at 90°
12. Release pinched skin
13. Push down on the plunger
14. Count to "5"
15. Remove and dispose of pen needle
16. Document time, dose, site, and blood glucose value

**Alabama State Department of Education
Delegation Decision-Making Grid
UNLICENSED DIABETIC ASSISTANT**

Elements for Review	Name: _____	Score
Level of Student Stability	Score the student's level of stability: 0. Student's condition is chronic/stable/predictable 1. Student's condition has minimal potential for change 2. Student's condition has moderate potential for change 3. Student's condition is unstable/acute/strong potential for change	
Level of UDA Competence	Score the UDA competence in completing delegated care activities in the school setting: 0. UDA - expert in activities to be delegated in the school setting 1. UDA - experienced in activities to be delegated in the school setting 2. UDA - experienced in activities, but not in the school setting 3. UDA – novice in performing activities and in the school setting	
Potential for Harm	Score the potential level of risk the care activity has for the student : <i>(risk is probability of suffering harm)</i> 0. None 1. Low 2. Medium 3. High	
Level of Decision-Making	Score the level of decision-making needs related to the student's cognitive and physical status: 0. Does not require decision making 1. Minimal level of decision making 2. Moderate level of decision making 3. High level of decision making	
Ability for Self-Care	Score the student's level of assistance needed for self-care activities: 0. No assistance 1. Limited assistance 2. Extensive assistance 3. Total care of constant attendance	
Response Time	Score the estimated time for access to the Emergency Medical System 0. Average response time of 3 minutes or less 1. Average response time of 3 minutes – 10 minutes 2. Average response time greater than 10 minutes	
Total Points Scored: <i>Score of 9 or less required for delegation</i>		
RN Signature _____	Date _____	