

# Diabetes Training for School Personnel



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# What is Diabetes?

## In diabetes:

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- The body does not make or properly use insulin

## Insulin is needed to:

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- Move glucose from blood into cells for energy

## If there is not enough insulin, or if it isn't working properly, high blood glucose results in:

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- Low energy levels
- Dehydration
- Complications

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# Type 1 Diabetes

Autoimmune disorder

Insulin-producing cells are destroyed

Daily insulin replacement is necessary for survival

Age of onset: usually childhood, young adulthood

Most common type of diabetes in children and adolescents

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# Type 1 Diabetes

## Onset:

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- Relatively quick

## Symptoms:

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- Increased urination
- Increased thirst
- Hunger
- Weight loss
- Dry skin
- Tiredness
- Blurred vision

## Cause:

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- Autoimmune: uncertain, both genetic and environmental factors

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# Type 2 Diabetes

## Onset:

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- Variable timeframe for children

## Symptoms:

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- Tired
- Thirsty
- Hungry
- Increased urination
  - Some children show no symptoms at diagnosis
  - Others are symptomatic with very high blood glucose levels

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# Type 2 Diabetes

First step, insulin resistance

Age of onset:  
most common in adults but increasingly common in youth

Insulin may or may not be required for treatment

Risk factors include:

- Overweight
- Inactivity
- Genes
- Ethnicity

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# Diabetes Management

Diabetes is managed, but it does not go away

## GOAL

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Maintain target blood glucose



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# 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 / student / parent or guardian / other school personnel



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# DMMP Information



- Emergency contact information
- Level of self-care
- Blood glucose monitoring including continuous glucose monitoring (CGM)
- Insulin/medication administration
- Glucagon administration
- Meal and snack schedule
- Physical activity and sports
- Recognition and treatment of hypoglycemia (low blood glucose) and hyperglycemia (high blood glucose)

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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
- Care needs will be outlined in the Diabetes Medical Management Plan (DMMP) for each student



## EMERGENCY CARE:

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

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# Hypoglycemia: Possible Signs and Symptoms

## Mild to Moderate Symptoms

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- Extreme Hunger
- Shakiness
- Weakness
- Paleness
- Dizzy or lightheaded
- Increased heart rate
- Yawning
- Irritability/frustration
- Extreme tiredness/fatigue
- Sleepiness
- Changed behavior
- Sweating
- Anxiety
- Dilated pupils
- Restlessness
- Confusion
- Sudden crying

## Severe Symptoms

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- Inability to eat or drink
- Unconscious
- Unresponsive
- Seizure activity or convulsions (jerking movements)

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# Hypoglycemia



**Hypoglycemia = LOW blood glucose (sugar)**

**Onset:**

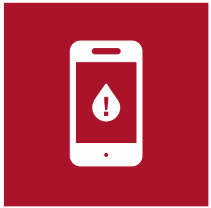
- Sudden and must be treated immediately
- May progress to unconsciousness if not treated
- Can result in brain damage or death

**Diabetes Medical Management Plan (DMMP) should specify signs and action steps at each level of severity**

- Mild or Level 1 (glucose < 70mg/dL)
- Moderate or Level 2 (glucose level < 54mg/dL)
- Severe or Level 3 (severe cognitive impairment, seizure)

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# Hypoglycemia: Possible Causes



- Too much insulin
- Too little food or delayed meal or snack
- Extra or unplanned physical activity
- Illness
- Medications
- Stress

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# Mild to Moderate Hypoglycemia: What to Do

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**INTERVENE  
PROMPTLY.**

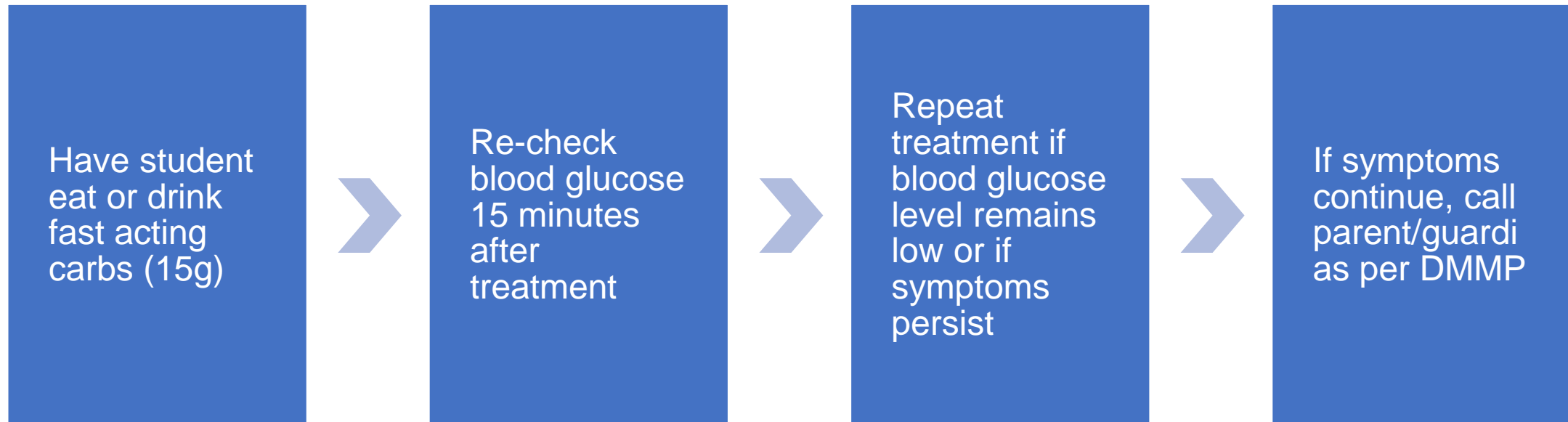
Follow DMMP.

- Check blood glucose if meter available
- If no meter is available, treat immediately. When in doubt, always treat. If untreated, may progress to more serious events.
- **NEVER send a student with suspected low blood glucose anywhere alone**
- Consider “Rule of 15”

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# “Rule of 15”

THESE ARE GENERAL GUIDELINES, FOLLOW DMMP FOR EACH STUDENT:



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# Quick acting glucose for low treatment



## TREATMENT FOR LOWS: 15 GRAMS OF CARBOHYDRATE

- 4 oz. fruit juice
- 3–4 glucose tablets
- 1 tube of glucose gel
- 4–6 small hard candies
- 1–2 tablespoons of honey
- 6 oz. regular (not diet) soda (about half a can)
- 4 tsp. table sugar



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# Severe Lows: What to Do



**RARE, BUT LIFE THREATENING IF NOT TREATED PROMPTLY:**

- Place student on their side
- Lift chin to keep airway open
- Provide glucagon, per student's DMMP
- Never give food or put anything in the student's mouth
- Call 911, then parent/guardian
- Student should respond in 10 to 20 minutes
- Remain with the student until help arrives

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# Prevention of Lows



- Physical activity, insulin, eating, checking blood glucose **per schedule**
- Keep a quick-acting sugar source with the student **ALWAYS**
- Treat at onset of symptoms
- Ensure reliable insulin dosing, per DMMP
- Pre-meal/snack insulin dose should be based on anticipated carbohydrates
  - Watch picky eaters
  - Provide nutritional information to parent/guardian
  - Any snacks should be provided by the parents/guardians
  - Provide substitute carbohydrate if they do not consume enough carbohydrates for the calculated insulin dosing
  - DMMP may specify after-meal dosing

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# Prevention of Lows



- Consult with parent/guardian or school nurse when snack, meal or physical activity times must be changed
- Monitor blood glucose variations on gym days
  - An extra snack may be required ½ hour before gym or during prolonged vigorous physical activity, per DMMP (parents/guardians should be providing appropriate snacks for student)
- A student should never be unattended when a low blood glucose is suspected. Maintain adult supervision.

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# 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

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# “Make The Right Choice The Easy Choice”

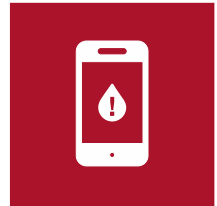


## Eliminate barriers to diabetes management:

- Become familiar with and follow a student’s individual 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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# Hyperglycemia



**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

**Diabetes Medical Management Plan (DMMP) should specify signs and action steps at each level of severity**

- Mild
- Moderate
- Severe

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# Hyperglycemia: Risks and Complications

Hyperglycemia, 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

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# Hyperglycemia: Possible Signs and Symptoms

## Mild Symptoms

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

## Moderate Symptoms

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- Dry mouth
- Vomiting
- Stomach cramps
- Nausea

## Severe Symptoms

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- Labored breathing
- Confusion
- Profound weakness
- Unconscious



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# Hyperglycemia: What to Do

## GOAL

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Lower the blood glucose to target range

## ACTION STEPS, FOLLOWING DMMP

- Verify with blood glucose check
- Check ketones—contact school nurse for guidance
- 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

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# 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 period
- Any combination of the above

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# Prevention of Highs

## Timing is very important – stick to the schedules

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- Meal time
- Insulin administration
- Physical activity

## Accuracy is very important

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- 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

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- Snack
- Meal
- Or insulin or physical activity times or amounts

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# “Make The Right Choice The Easy Choice”



## Eliminate barriers to diabetes management:

- Become familiar with and follow a student’s individual written plans
- Eliminate barriers to:
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  - 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

# 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 Diabetes Medical Management Plan (DMMP):

Facilitate blood glucose monitoring (BGM)

Act on blood glucose check results

Document results of BGM when assistance or supervision is provided

Communicate BGM results to parent/guardian or school nurse to monitor for trends

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# Any Time, Any Place Monitoring



## Benefits of diabetes self-management for capable students:

- Improved blood glucose control
- Safer for students
- Students gain independence
- Less stigma
- Less time out of class
- Assists decision making in response to blood glucose result
- Test and treat anywhere/anytime. Does not need to go to the nurse.



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# Basic Steps

**Know** the target range per DMMP

**Check** at times specified in DMMP

**Take immediate action**—administer 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
- Before dismissal

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# When else 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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# 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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# Insulin in Schools Today



- Students with diabetes may need to take insulin in school
- Insulin dosing varies from student-to-student and changes over time as they grow and develop
- A 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:

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- Moves glucose from blood into cells for energy

- Students with type 1 may not produce enough insulin.
- Students with type 2 diabetes may still make insulin, however, it is not utilized properly due to their insulin resistance.

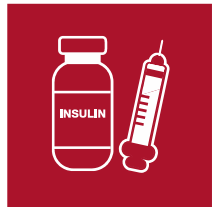
## Without enough insulin action, high blood glucose results in:

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- Low energy levels
- Dehydration
- Complications

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# When to Give Insulin



## DMMP SHOULD SPECIFY DOSING CLEARLY

Generally:

- Before meals or snacks
- For blood glucose levels above target range
- For moderate or large ketones, call provider for dose

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# Dosing Insulin at School



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

- Some students will use a fixed insulin dose
- Others will have a varied dose, depending upon:
  - What food is eaten (carb dose) and/or
  - Whether blood glucose is within the target range (correction dose)



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# Type 2 Diabetes



- While type 2 diabetes often presents in adults, type 2 diabetes can develop at any age
- The incidence of type 2 diabetes in youth has increased in the past 20 years with approximately 5,000 new cases yearly and increasing by 2.3% annually
- Type 2 diabetes is a progressive disease marked by a condition called insulin resistance whereby the cells do not respond to insulin properly
- Over time, the pancreas loses its ability to make enough insulin to control blood glucose (blood sugar) levels after meals, overnight, or during periods of fasting
- Management of type 2 diabetes in students is required

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# Symptoms

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Extreme fatigue, increased thirst, increased urination, feeling hungry, blurry vision.

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Unexplained weight loss and blurred vision, acanthosis nigricans (darken, thick, velvety skin) around neck, armpits, or groin area

- Not all youth with acanthosis nigricans have type 2 diabetes

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Sometimes youth do not have symptoms or symptoms are mild at diagnosis

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# Urgent Needs of Students with Type 2 Diabetes

Student may be at risk for hypoglycemia (low blood glucose) if taking insulin

Student may be at risk for hyperglycemia (high blood glucose), ketones, and diabetic ketoacidosis (DKA) if uncontrolled

Proceed with the treatment of hypoglycemia and hyperglycemia as per the student's DMMP

Urgent medical evaluation may be needed if DKA is suspected

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# As a teacher, you can help by:

- Supporting self-care by capable students
- Providing easy-access to diabetes supplies
- Ensuring students eat snacks at a scheduled time and make sure snacks are available to treat low blood sugar
- Providing students reasonable time to make up missed homework or tests
- Learning about diabetes and complying with the individual student's 504 and healthcare plans
- Supporting diabetes care and providing free access to bathrooms/water during class

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# Other Classroom Tips:

- Keep a contact sheet of trained diabetes staff at your desk for emergencies
- Create a diabetes info sheet for substitute teachers
- Learn signs and responses to low/high blood glucose levels
- Educate your students about diabetes
- Let parents know, in advance, changes to the class schedule (field trips, special events, etc.)

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# Needs Addressed by 504 Plan/IEP



- Location and timing of blood glucose (blood sugar) 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 with diabetes care provided by trained school staff
- 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

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# Emergency Care Plans for Hypoglycemia and Hyperglycemia



- Summarizes how to recognize and treat hypoglycemia and hyperglycemia
- Based on information from the DMMP or provider's orders
- Distributed to all school staff and other school personnel who have responsibility for a student with diabetes

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# Written Plans for Diabetes Management

## DMMP

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### What it covers:

Provider's orders—detail all aspects of routine and emergency diabetes care.

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### Who writes it:

Student's diabetes provider in collaboration with parent/guardian and school nurse

## 504 Plan/IEP

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### What it covers:

Education plans—details both health care and educated related aids, services, accommodations, and special education services the student needs.

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### Who writes it:

504 team/ IEP team

## IHP

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### What it covers:

outlines the provision of diabetes care in the school setting

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### Who writes it:

School nurse





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## Diabetic Training—next steps...

- ✓ Review Student's DMMP
  - ✓ Discuss each student's dosing and medication management while at school
- ✓ Review Student's IEP/504 if needed
- ✓ Begin Medication Administration Skills Checklist Training