Diabetes Care Tasks at School: What Key Personnel Need To Know

DIABETES MEDICAL MANAGEMENT PLAN (DMMP)

Safe at School®

American Diabetes Association®

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

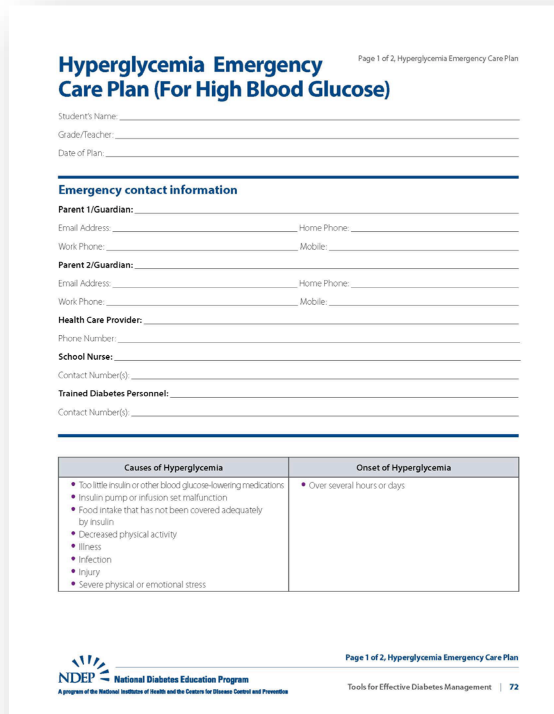
- Section 504 Plan
- Individualized Education Program (IEP)
- Individualized Health Care Plan (IHP)
- Emergency Care Plans for Hypoglycemia and Hyperglycemia

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

EMERGENCY CARE PLANS FOR HYPOGLYCEMIA AND HYPERGLYCEMIA

- 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



Page 1 of 2, Hyperglycemia Emergency Care Plan

Hyperglycemia Emergency Care Plan (For High Blood Glucose)

Student's Name: ____

Grade/Teacher: ____

Date of Plan: ____

Emergency contact information

Parent 1/Guardian: ____

Email Address: ____ Home Phone: ____

Work Phone: ____ Mobile: ____

Parent 2/Guardian: ____

Email Address: ____ Home Phone: ____

Work Phone: ____ Mobile: ____

Health Care Provider: ____

Phone Number: ____

School Nurse: ____

Contact Number(s): ____

Trained Diabetes Personnel: ____

Contact Number(s): ____

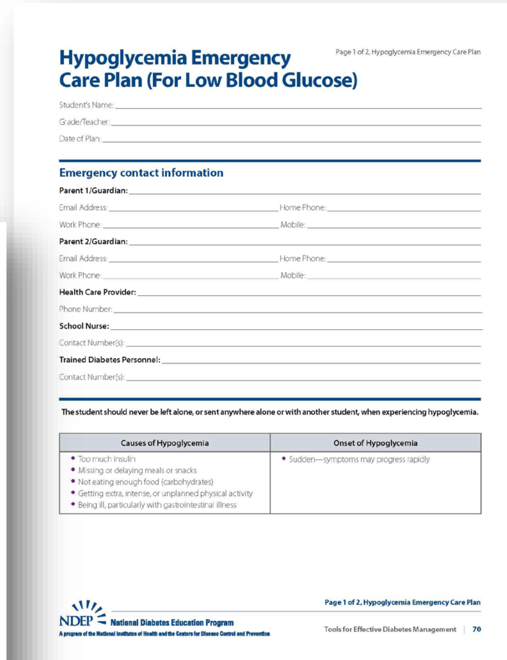
Causes of Hyperglycemia	Onset of Hyperglycemia
• Too little insulin or other blood glucose-lowering medications • Insulin pump or infusion set malfunction • Food intake that has not been covered adequately by insulin • Decreased physical activity • Illness • Infection • Injury • Severe physical or emotional stress	• Over several hours or days

Page 1 of 2, Hyperglycemia Emergency Care Plan

NDEP National Diabetes Education Program

A program of the National Institutes of Health and the Centers for Disease Control and Prevention

Tools for Effective Diabetes Management | 72



Page 1 of 2, Hypoglycemia Emergency Care Plan

Hypoglycemia Emergency Care Plan (For Low Blood Glucose)

Student's Name: ____

Grade/Teacher: ____

Date of Plan: ____

Emergency contact information

Parent 1/Guardian: ____

Email Address: ____ Home Phone: ____

Work Phone: ____ Mobile: ____

Parent 2/Guardian: ____

Email Address: ____ Home Phone: ____

Work Phone: ____ Mobile: ____

Health Care Provider: ____

Phone Number: ____

School Nurse: ____

Contact Number(s): ____

Trained Diabetes Personnel: ____

Contact Number(s): ____

The student should never be left alone, or sent anywhere alone or with another student, when experiencing hypoglycemia.

Causes of Hypoglycemia	Onset of Hypoglycemia
• Too much insulin • Missing or delaying meals or snacks • Not eating enough food (carbohydrates) • Getting extra, intense, or unplanned physical activity • Being ill, particularly with gastrointestinal illness	• Sudden—symptoms may progress rapidly

Page 1 of 2, Hypoglycemia Emergency Care Plan

NDEP National Diabetes Education Program

A program of the National Institutes of Health and the Centers for Disease Control and Prevention

Tools for Effective Diabetes Management | 70

American Diabetes Association®

Safe at School®

Pre – and Post – Test: DIABETES MEDICAL MANAGEMENT PLAN (DMMP)

This tool may be freely duplicated and distributed for training purposes

1. **The DMMP should be implemented collaboratively by:**
    a. *School nurse*
    b. *Teachers and/or other school staff*
    c. *Parent/student*
    d. *All of the above.*

2. **Which of the following actions is not usually contained in the DMMP?**
    a. *Frequency of blood glucose monitoring*
    b. *Insulin dosing and frequency*
    c. *Treatment of low and high blood glucose*
    d. *Test taking at alternate times if blood glucose level is outside target range*

3. **The Section 504 Plan should be based upon and implemented in accordance with the DMMP.**
    3. *True*
    4. *False*

4. **The Section 504 contains insulin dosage information.**
    4. *True*
    5. *False*

5. **Which of the following are the types of written plans a student with diabetes might have?**
    5. *Section 504 Plan*
    6. *Diabetes Medical Management Plan*
    7. *Individualized Healthcare Plan*
    8. *Emergency/Disaster Plan*
    9. *All of the above*

Diabetes Care Tasks at School:
What Key Personnel Need To Know

HYPERGLYCEMIA

Safe at School®

American Diabetes Association®

GOAL: OPTIMAL STUDENT HEALTH AND LEARNING

Managing hyperglycemia is a vital piece of a comprehensive plan.

LEARNING OBJECTIVES

Participants will be able to understand:

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

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 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

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

DMMP should specify signs and action steps at each level of severity

- Mild
- Moderate
- Severe

HYPERGLYCEMIA: POSSIBLE SIGNS AND SYMPTOMS

Mild Symptoms

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

Dry mouth	Vomiting
Stomach cramps	Nausea

Severe Symptoms

Labored breathing	Confusion
Profound weakness	Unconscious

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

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*

American Diabetes Association®

Safe at School®

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

American Diabetes Association®

Safe at School®

Pre – and Post – Tests: **HYPERGLYCEMIA**

This tool may be freely duplicated and distributed for training purposes

1. **Hyperglycemia is:**
    a. *Inability to concentrate*
    b. *Low blood glucose*
    c. *High blood glucose*
    d. *Excess energy*

2. **The symptoms of hyperglycemia include:**
    a. *Increased thirst*
    b. *Frequent urination*
    c. *Blurred vision*
    d. *All of the above*

3. **If left untreated, hyperglycemia resulting from insufficient insulin can lead to:**
    a. *A rash*
    b. *Seizure*
    c. *Ringing in the ears*
    d. *Diabetic ketoacidosis (DKA)*

4. **Hyperglycemia is sometimes caused by illness, injury, stress or infection.**
    a. *True*
    b. *False*

5. **Hyperglycemia is usually treated with:**
    a. *A peanut butter and jelly sandwich*
    b. *Water*
    c. *Glucose tabs*
    d. *Insulin*
    e. *b and d*

Diabetes Care Tasks at School:
What Key Personnel Need To Know

KETONES

Safe at School®

American Diabetes Association®

GOAL: OPTIMAL STUDENT HEALTH AND LEARNING

Ketone monitoring is a vital piece of a comprehensive plan.

American Diabetes Association®

Safe at School®

LEARNING OBJECTIVES

Participants will be able to understand:

- *What ketones are*
- *Why ketones are monitored*
- *When ketones should be monitored*
- When to contact school nurse, parent/guardian, healthcare provider
- How to perform a ketone check

WHAT ARE KETONES?

Acids that result when the body does not have enough insulin and uses fats for energy

May occur when insulin is not given, during illness or extreme bodily stress, or with dehydration

Can cause abdominal pain, nausea, and vomiting

Without sufficient insulin, ketones continue to build up in the blood and result in diabetic ketoacidosis (DKA)

WHY CHECK FOR KETONES?

- DKA is a critical emergency state
- Early detection and treatment of ketones prevents diabetic ketoacidosis (DKA) and hospitalizations due to DKA
- Untreated, progression to DKA may lead to severe dehydration, coma, permanent brain damage, or death
- DKA is the number one reason for hospitalizing children with diabetes

WHEN SHOULD KETONES BE CHECKED?

The DMMP should specify, generally:

- When blood glucose remains elevated
- During acute illness, infection or fever
- Whenever symptoms of DKA are present
  - Nausea
  - Vomiting or diarrhea
  - Abdominal Pain
  - Fruity breath odor
- Common symptoms including fruity odor to breath, nausea, vomiting, drowsiness, abdominal pain

American Diabetes Association®

Safe at School®

HOW QUICKLY DOES DKA PROGRESS?

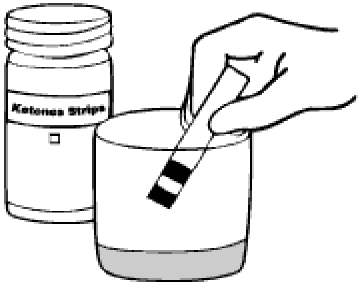
- An isolated high blood glucose reading, in the absence of other symptoms is not cause for alarm
- DKA usually develops over hours, or even days
- DKA can progress much more quickly for students who use insulin pumps, or those who have an illness or infection
- Most at risk when symptoms of DKA are mistaken for flu and high blood glucose is unchecked and untreated

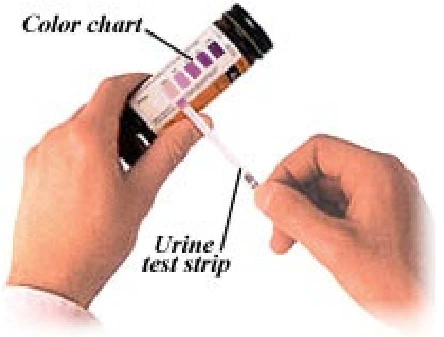
CHECKING FOR KETONES

Urine	• Most widely used
Blood	• Requires a special meter and strip • Procedure similar to blood glucose checks

HOW TO CHECK URINE KETONES

1. Gather supplies
2. Student urinates in clean cup
3. Put on gloves, if performed by someone other than student
4. Dip the ketone test strip in the cup containing urine and shake off excess urine
5. Wait 15 - 60 seconds, as indicated on bottle
6. Read results at designated time
7. Record results, take action per DMMP

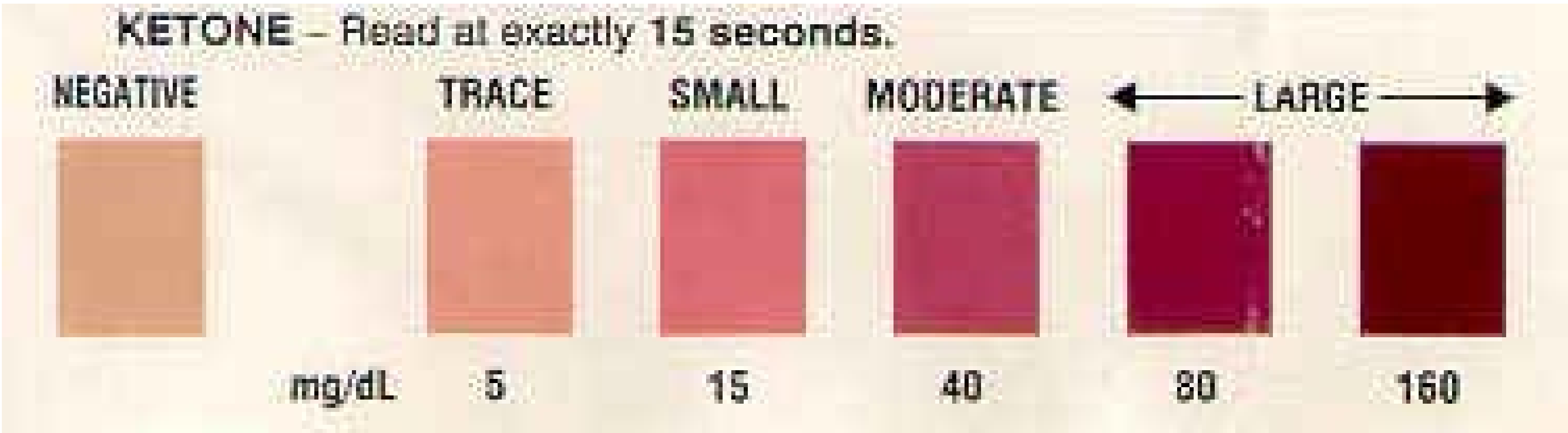




American Diabetes Association®

Safe at School®

URINE KETONE RESULTS: COLOR CODE



- no ketones
- trace
- small
- moderate
- large ketones present

CONSIDERATIONS

- Colors on strips and timing vary according to brand
- If using a scale with "urine glucose" and "urine ketones," be sure to read the correct scale when checking for ketones
- Follow package instructions regarding expiration dates, time since opening, correct handling, etc., as incorrect results may occur

TREATMENT OF KETONES

DMMP specifies treatment for ketones for the individual student. Generally:

- Free use of bathroom
- Water or other sugar-free liquids
- Insulin as per DMMP
- Limit physical activity
- If vomiting or lethargic, call parent/guardian

Pre – and Post – Tests:

KETONES

This tool may be freely duplicated and distributed for training purposes

1. ***Ketones are:***
   a. *Acids that result when the body does not have enough insulin*
   b. *Caused by alcohol consumption*
   c. *Caused by eating too much sugar*

2. ***Untreated ketones can build up in the blood and result in***
   .
   a. *Insomnia*
   b. *Nervousness*
   c. *Diabetic ketoacidosis (DKA)*

3. ***DKA is the number one reason children with diabetes are hospitalized.***
   a. *True*
   b. *False*

4. ***Ketones can develop more quickly in children who wear insulin pumps.***
   a. *True*
   b. *False*

5. ***Ketones are checked by using:***
   a. *Saliva*
   b. *Urine*
   c. *Blood*
   d. *Body temperature*
   e. *a and b*
   f. *b and c*

Diabetes Care Tasks at School:
What Key Personnel Need To Know

HYPOGLYCEMIA

Safe at School®

American Diabetes Association®

GOAL: OPTIMAL STUDENT HEALTH AND LEARNING

Managing hypoglycemia is a vital piece of a comprehensive plan.

LEARNING OBJECTIVES

Participants will be able to understand:

- *Symptoms of low blood glucose*
- *Treatment of low blood glucose*
- *Reduce risk of low blood glucose*
- *Short- and long-term risks and complications*

VOCABULARY

Glucose – simple sugar found in the blood; fuel that all body cells need to function

HYPOglycemia – a LOW level of glucose in the blood

Quick-acting glucose – source of simple sugar that raises blood glucose levels; examples are juice, regular soda, glucose tabs or gel, hard candy

Glucose tablets or gel – special products that deliver a pre-measured amount of pure glucose. They are a fast-acting form of glucose used to counteract hypoglycemia

Carbohydrate – source of energy for the body which raises blood glucose level

Glucagon – hormone given by injection that raises level of glucose in the blood

HYPOGLYCEMIA

HYPOglycemia = LOW Glucose (sugar)

Onset:

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

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)

HYPOGLYCEMIA: RISKS AND COMPLICATIONS

- Early recognition and intervention can prevent an emergency
- Greatest immediate danger
- Not always preventable
- Impairs cognitive and motor functioning

American Diabetes Association®

Safe at School®

HYPOGLYCEMIA: POSSIBLE CAUSES

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

POSSIBLE SIGNS AND SYMPTOMS

Mild to Moderate Symptoms

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

Severe Symptoms

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

American Diabetes Association®

Safe at School®

MILD TO MODERATE HYPOGLYCEMIA: WHAT TO DO

Intervene promptly; follow DMMP

- Check blood glucose if meter available
- If no meter is available, treat immediately, on the spot
  - 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"

“RULE OF 15”

These are general guidelines, follow DMMP for each student:

Have student eat or drink fast acting carbs (15g) → *Re-check blood glucose 15 minutes after treatment* → *Repeat treatment if blood glucose level remains low or if symptoms persist* → *If symptoms continue, call parent/guardian per DMMP*

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

SEVERE HYPOGLYCEMIA SYMPTOMS

- Inability to eat or drink
- Unconsciousness
- Unresponsive
- Convulsions (seizures)

SEVERE LOWS: WHAT TO DO

Rare, but life threatening, if not treated promptly:

- Place student on his or her side
- Lift chin to keep airway open
- Administer 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

Pre – and Post – Tests:

HYPOGLYCEMIA

This tool may be freely duplicated and distributed for training purposes

1. ***What is the most serious immediate danger to the student with diabetes?***
   1. *Running out of diabetes supplies*
   2. *Forgetting a scheduled blood glucose monitoring*
   3. *Hypoglycemia (low blood glucose)*
   4. *Forgetting to refrigerate insulin*

2. ***What causes hypoglycemia?***
   2. *Too much insulin*
   3. *Too little food or delayed meal/snack*
   4. *Unanticipated physical activity*
   5. *All of the above*

3. ***Sweating is a symptom of hypoglycemia.***
   a. *True*
   b. *False*

4. ***If no blood glucose meter is available, treat for hypoglycemia.***
   4. *True*
   5. *False*

5. ***Which of the following is the best treatment for hypoglycemia?***
   a. *Water*
   b. *M & M's*
   c. *4 oz. of orange juice*
   d. *Carrot sticks*

6. ***What is glucagon?***
   a. *A sugary gel given to treat hypoglycemia*
   b. *A naturally occurring hormone*
   c. *A blood glucose test*
   d. *None of the above*

7. ***When is a glucagon injection needed?***
   a. *Shakiness*
   b. *Inability to swallow*
   c. *Hunger*
   d. *Sweating*

Diabetes Care Tasks at School:

What Key Personnel Need To Know

GLUCAGON ADMINISTRATION

Safe at School®

American Diabetes Association®

GOAL: OPTIMAL STUDENT HEALTH AND LEARNING

Timely glucagon administration, when indicated, is a vital piece of a comprehensive plan.

LEARNING OBJECTIVES

Participants will be able to understand:

- *What glucagon is*
- *How glucagon should be stored*
- *When glucagon is used*
- *How to administer glucagon*

WHAT IS GLUCAGON?

Naturally occurring hormone made in the pancreas

Life-saving, hormone that raises blood glucose level by stimulating the liver to release stored glucose

Nasal Spray (Baqsimi)

Injectable (Glucagon/GlucaGen/Gvoke)

Treatment for severe hypoglycemia

Life-saving, cannot harm a student – cannot overdose

BAQSIMI

STORAGE AND HANDLING

- Do not remove Shrink Wrap or open the Tube until ready to use.
- Store BAQSIMI in the shrink-wrapped Tube at temperatures up to 86ºF (30ºC).
- Replace BAQSIMI before the expiration date printed on the Tube or carton.

PREPARING THE DOSE

Remove the Shrink Wrap by pulling on the red stripe.

PREPARING THE DOSE

Open the Lid and remove the Device from the Tube.

Caution: Do not press the Plunger until ready to give the dose.

American Diabetes Association®

Giving the dose

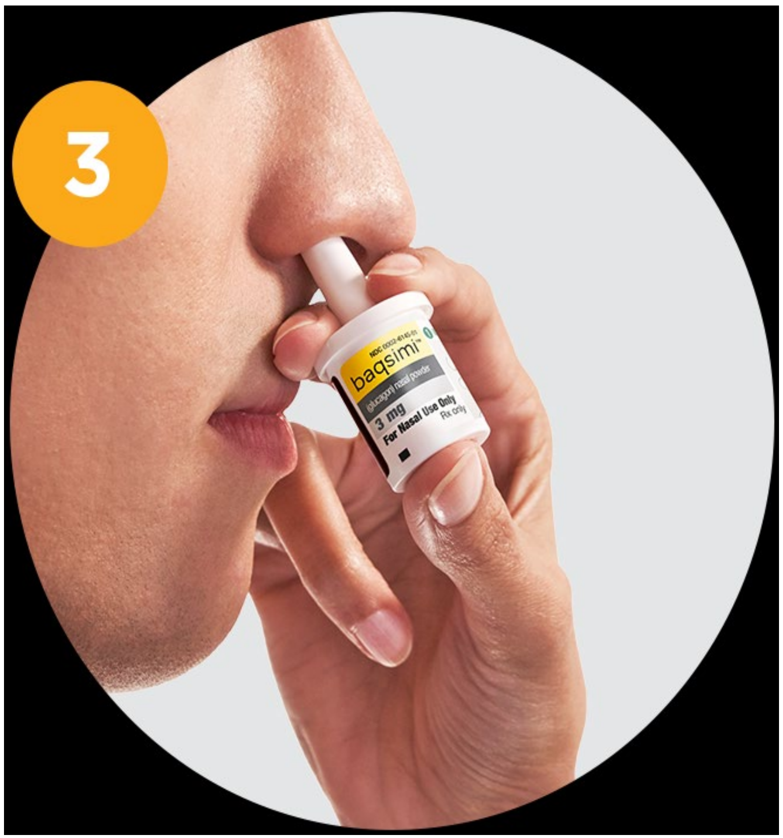
Hold Device between fingers and thumb.

Do not push Plunger yet.

Insert Tip gently into one nostril until finger(s) touch the outside of the nose.

Giving the dose

Push Plunger firmly all the way in.



Dose is complete when the Green Line disappears.

After giving BAQSIMI:

- Call 9-1-1.
- Activate MERT Medical Emergency Response Team.
- Turn the person on their side.
- Write Time on the used Device and Tube and give to EMS personnel.

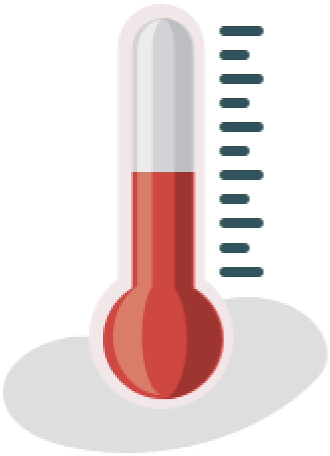
GVOKE

Pre-filled Syringe

Gvoke™ PFS
(glucagon injection)
PRE-FILLED SYRINGE

Premixed, prefilled, premeasured liquid glucagon for treatment of very low blood sugar in adults and kids with diabetes ages 2 and over

STORAGE



Gvoke should be stored at room temperature

Gvoke comes in a single pack or in a convenient 2-pack

Dosing

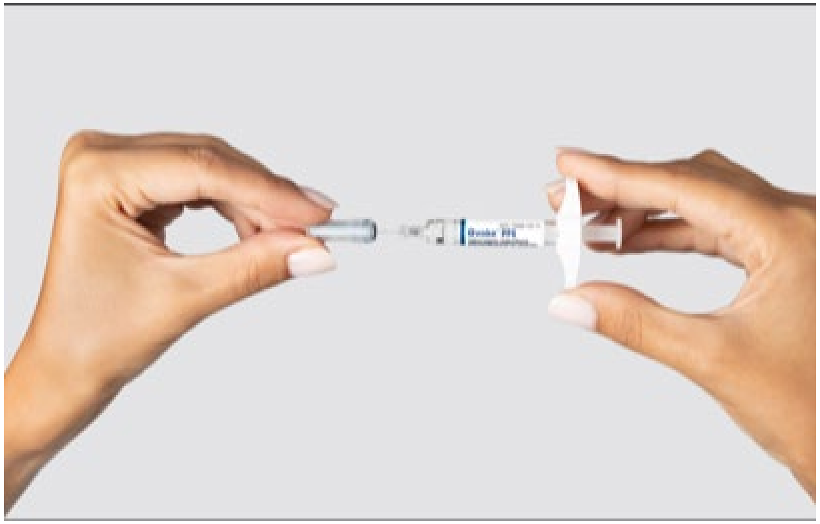
2 doses:

- Adolescents and adults (1.0 mg)
- Children (0.5 mg)

**Children younger than 12 who weigh at least 100 pounds may be prescribed the 1.0 mg dose.*

Prepare

Pull cap straight off the syringe.



Inject

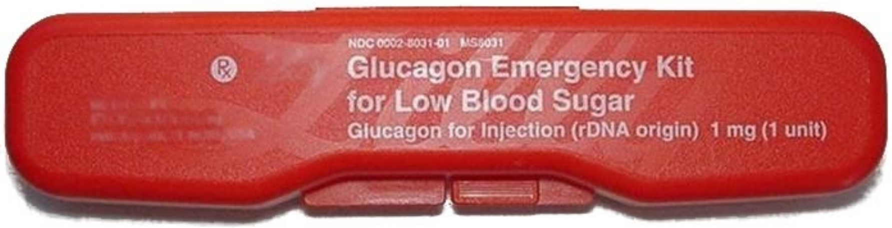
Pinch the skin of the upper arm, lower stomach, or outer thigh and insert the needle at a 90-degree angle.

Push the plunger down as far as it will go.

After using Gvoke:

*Place victim on their side
*Call for emergency help
*Call MERT (Medical Emergency Response Team)

GLUCAGON/GLUCAGEN EMERGENCY KIT



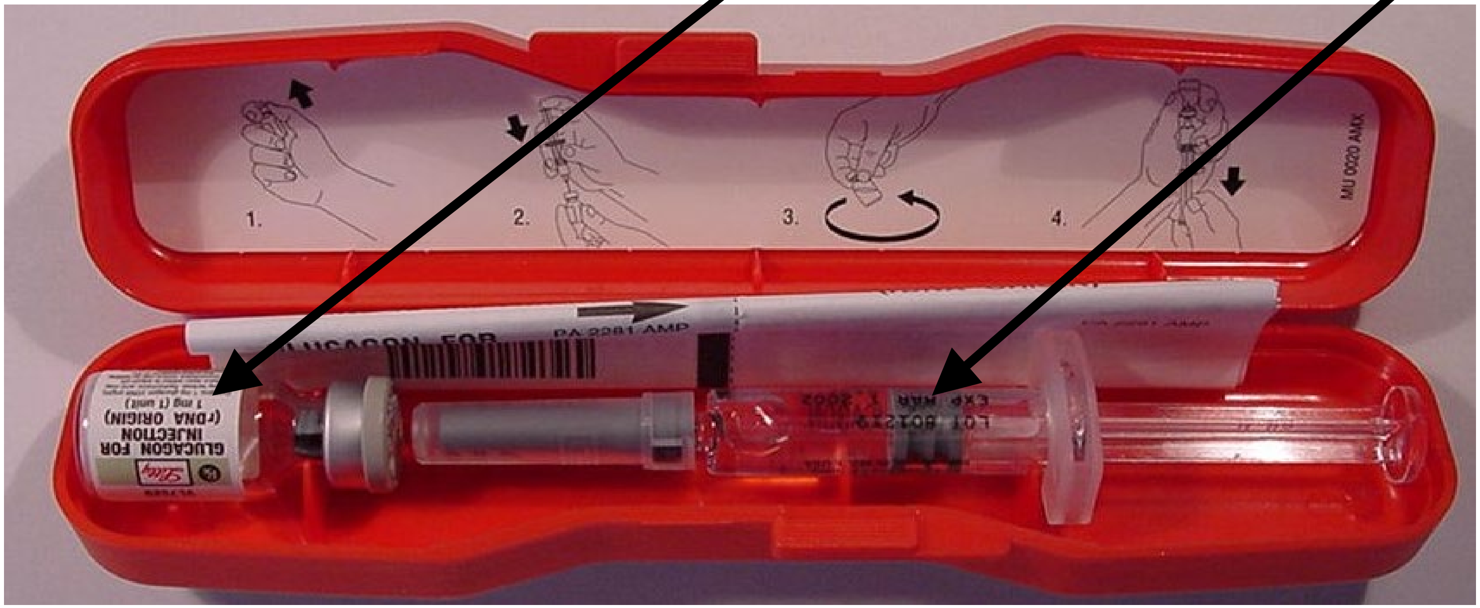
STORAGE

- Maintain accessible to school personnel, as designated in DMMP
- Store at room temperature
- Monitor the expiration date
- After mixing, dispose of any unused portion within one hour

EMERGENCY KIT CONTENTS:

1 mg of freeze-dried glucagon (Vial)

1 ml of water for reconstitution (Syringe)



Combine immediately before use

WHEN TO GIVE GLUCAGON/GLUCAGEN

If authorized by the student's DMMP and if student exhibits:

- *Unconsciousness, unresponsiveness*
- *Convulsions (seizures)*
- *Inability to safely eat or drink*

PROCEDURE

Act immediately → Call 911, MERT, parent/guardian, school nurse as per DMMP or emergency care plan

If in doubt, always treat → Position student safely on side for comfort and protection from injury

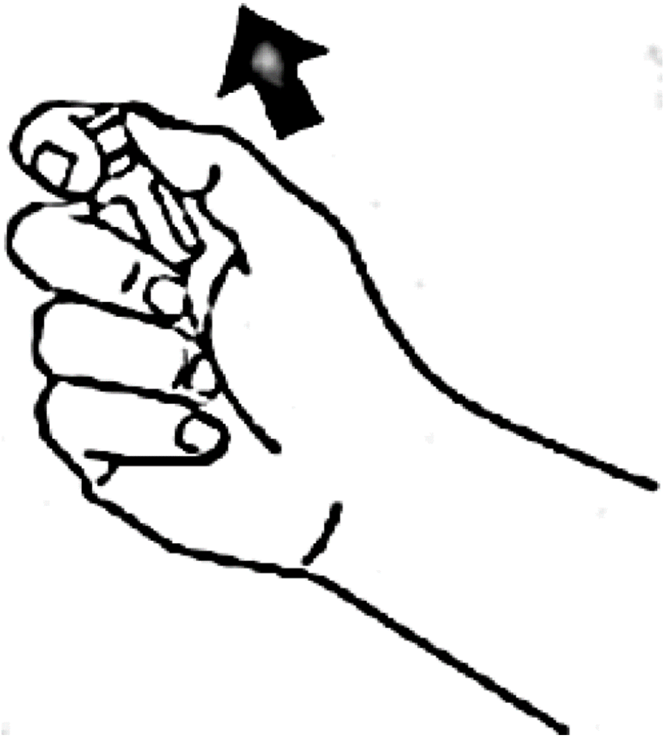
School nurse or trained personnel notified to give glucagon in accordance with DMMP or emergency care plan

PREPARATION

1. Flip cap off glass vial containing dry powder

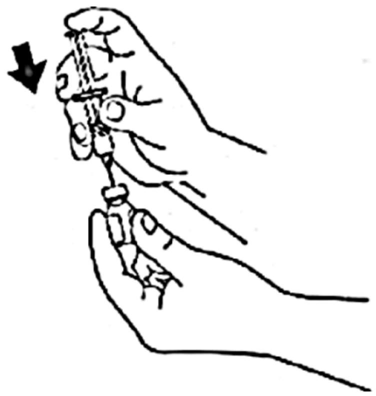
2. Remove cap from syringe

3. Put on gloves if available



MIXING SOLUTION

4. Inject entire fluid in syringe into the bottle containing powder

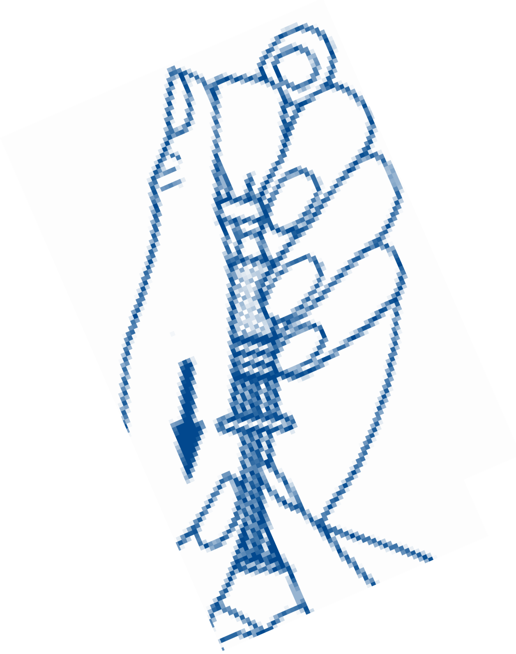


5. Shake gently or roll to mix until all powder is dissolved and solution is clear.

DOSING AND DRAWING OUT

6. Inspect. Solution should be clear and colorless.

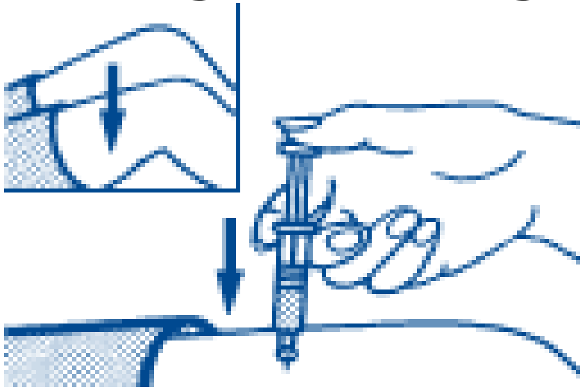
7. Draw prescribed amount of glucagon back into syringe.



INJECTING

8. Clean site if possible.

9. Inject at 90° into the tissue under cleansed area (may administer through clothing as necessary
    - buttocks
    - thigh
    - arm



CONSIDERATIONS

- The time to complete recovery from a severe hypoglycemic episode varies according to how low the blood glucose level was and for how long prior to treatment
- Some signs and symptoms, such as headache, may persist for several hours, although the blood glucose level is satisfactory
- Continued monitoring is important
- Student needs to be transported via EMS

DON'T BE SURPRISED IF…

- Student does not remember being unconscious, incoherent or has a headache
- Blood glucose becomes very high (over 200)
- Nausea or vomiting may occur

Pre – and Post – Tests:

GLUCAGON ADMINISTRATION

1. **Glucagon is used to treat:**
   a. *Hyperglycemia*
   b. *Hypoglycemia*

2. **Glucagon is a naturally occurring hormone made by the pancreas.**
   a. *True*
   b. *False*

3. **Glucagon is given when:**
   a. *Unconsciousness/unresponsiveness*
   b. *Convulsion/seizure*
   c. *Inability to safety eat or drink*
   d. *All of the above*

4. **Which of the following sites is not usually used for glucagon injection:**
   4. *Stomach*
   5. *Arm*
   6. *Thigh*
   7. *Buttocks*

5. **The student should be positioned on his or her side before glucagon is administered:**
   a. *True*
   b. *False*

WHERE TO GET MORE INFORMATION

American Diabetes Association

1-800- DIABETES

www.diabetes.org/safeatschool