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

KETONES
GOAL: OPTIMAL STUDENT HEALTH AND LEARNING

Ketone monitoring is a vital piece of a comprehensive plan.
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
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)

WHAT ARE KETONES?
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
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
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
HOW TO CHECK FOR BLOOD KETONES

1. Prepare lancing device

2. Wash hands using warm soapy water and dry them completely

3. Remove the test strip from its foil packet

4. Insert the three black lines at the end of the test strip into the strip port

5. Push the test strip in until it stops
HOW TO CHECK FOR BLOOD KETONES

6. Touch the blood drop to the purple area on the top of the test strip. The blood is drawn into the test strip.

7. Continue to touch the blood drop to the purple area on the top of the test strip until the monitor begins the test.

8. The blood ß-Ketone result shows on the display window with the word KETONE.
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
Module 12 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
WHERE TO GET MORE INFORMATION

American Diabetes Association
1-800- DIABETES
www.diabetes.org/safeatschool