

AAOS

Ninth Edition

Emergency

Care and Transportation of the Sick and Injured



Section 4: Medical Emergencies

15: Diabetic Emergencies

Cognitive Objectives (1 of 2)

- 4-4.1 Identify the patient taking diabetic medications with altered mental status and the implications of a history of diabetes.
- 4-4.2 State the steps in the emergency medical care of the patient taking diabetic medicine with an altered mental status and a history of diabetes.
- 4-4.3 Establish the relationship between airway management and the patient with altered mental status.

Cognitive Objectives (2 of 2)

- 4-4.4 State the generic and trade names, medication forms, dose, administration, action, and contraindications for oral glucose.
- 4-4.5 Evaluate the need for medical direction in the emergency medical care of the diabetic patient.

Affective Objectives

4-4.6 Explain the rationale for administering oral glucose.

Psychomotor Objectives

- 4-4.7 Demonstrate the steps in the emergency medical care for the patient taking diabetic medicine with an altered mental status and a history of diabetes.
- 4-4.8 Demonstrate the steps in the administration of oral glucose.
- 4-4.9 Demonstrate the assessment and documentation of patient response to oral glucose.
- 4-4.10 Demonstrate how to complete a prehospital care report for patients with diabetic emergencies.

Additional Objectives

1. Demonstrate the steps in the use of a glucometer.
 - This is a noncurriculum objective.

Defining Diabetes (1 of 2)

- Diabetes mellitus
 - Metabolic disorder in which the body cannot metabolize glucose
 - Usually due to a lack of insulin
- Glucose
 - One of the basic sugars in the body
 - Along with oxygen, it is a primary fuel for cellular metabolism.

Defining Diabetes (2 of 2)

- Insulin
 - Hormone produced by the pancreas
 - Enables glucose to enter the cells
 - Without insulin, cells starve.
- Hormone
 - Chemical substance produced by a gland
 - Has special regulatory effects on other body organs and tissues

Type I Diabetes

- Insulin-dependent diabetes
- Patient does not produce any insulin.
- Insulin injected daily
- Onset usually in childhood

Type II Diabetes

- Non-insulin-dependent diabetes
- Patient produces inadequate amounts of insulin.
- Disease may be controlled by diet or oral hypoglycemics.

Role of Glucose and Insulin

- Glucose is the major source of energy for the body.
- Constant supply of glucose needed for the brain
- Insulin acts as the key for glucose to enter cells.

Hyperglycemia

- Lack of insulin causes glucose to build-up in blood in extremely high levels.
- Kidneys excrete glucose.
- This requires a large amount of water.
- Without glucose, body uses fat for fuel.
- Ketones are formed.
- Ketones can produce diabetic ketoacidosis.

Signs and Symptoms of Diabetic Ketoacidosis

- Vomiting
- Abdominal pain
- Kussmaul respirations
- Unconsciousness

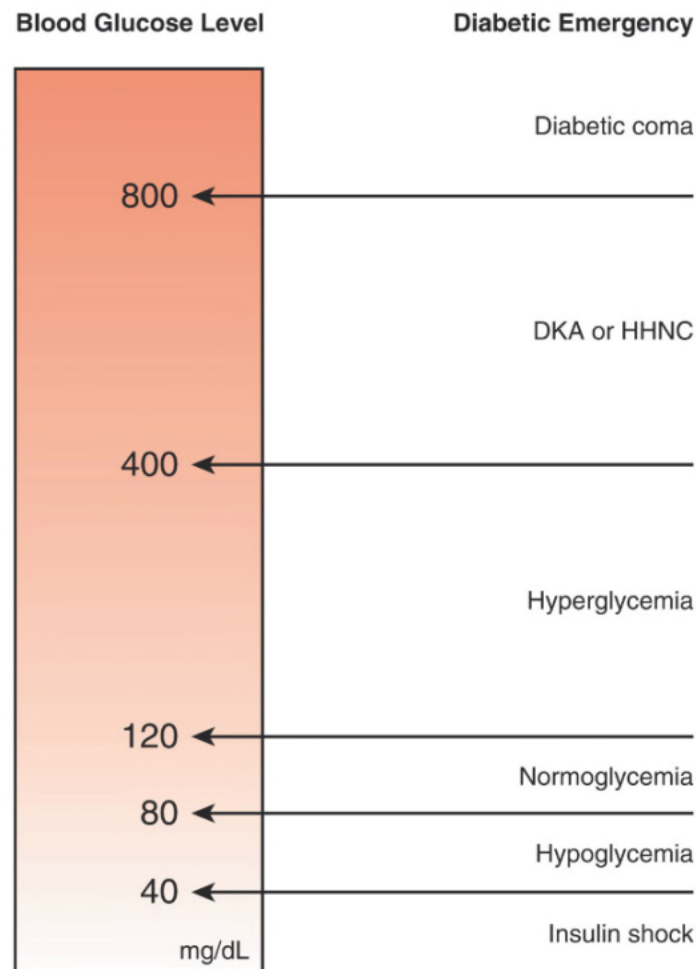


Blood Glucose Monitors

- Glucometer
- Normal range
80-120 mg/dL
- Test strips



Diabetic Emergencies According to Blood Glucose Level



Signs of Diabetic Coma

- Kussmaul respirations
- Dehydration
- “Fruity” breath odor
- Rapid, weak pulse
- Normal or slightly low blood pressure
- Varying degrees of unresponsiveness

Signs of Insulin Shock

- Normal or rapid respirations
- Pale, moist skin
- Sweating
- Dizziness, headache
- Rapid pulse
- Normal to low blood pressure
- Altered mental status
- Aggressive or confused behavior
- Hunger
- Fainting, seizure, or coma
- Weakness on one side of the body

You are the Provider

- You and your partner are dispatched for a 43-year-old man who is “very sweaty and acting strangely.”
- Police are on scene.
- Patient is rocking back and forth.
- Patient repeatedly says he needs to go home.
- Patient is pale, sweaty, and trembling.

You are the Provider

(continued)

- Should this patient be allowed to refuse treatment?
- What additional resources are indicated for this patient?

Scene Size-up

- Scene safety remains a priority.
- Beware of used syringes.
- Ensure that needed resources are requested.
- Consider spinal immobilization based on MOI.

You are the Provider

(continued)

- As you assemble your equipment, your partner tells you the patient is wearing a medic alert tag.
- The patient is an insulin-dependent diabetic.
- The patient's glucose level is 45 mg/dL.
- What is your next step?

Initial Assessment

- General impression
 - Does the patient appear anxious, restless, or listless?
 - Is the patient apathetic or irritable?
 - Is the patient interacting with the environment appropriately?
- If the patient has an altered mental status, summon ALS immediately.

Airway and Breathing

- Check for adequate airway; treat appropriately.
- Breathing:
 - If adequate or patient has an altered mental status, provide oxygen via nonrebreathing mask at 10 to 15 L/min.
 - If inadequate, ensure ventilations with 100% oxygen.
- A hyperglycemic patient may have:
 - Rapid, deep respirations (Kussmaul respirations)
 - Sweet, fruity breath odor

Circulation

- Warm, dry skin = diabetic coma
- Moist, pale skin = insulin shock
- Rapid, weak pulse = insulin shock

Transport Decision

- Depends on LOC and ability to swallow
- Patients with altered mental status and impaired ability to swallow should be transported promptly.
- Patients who can swallow and maintain own airway may be further evaluated and interventions performed.

Focused History and Physical Exam

- Unresponsive patients receive a rapid physical exam.
- Ask patients with known diabetes:
 - Do you take insulin or any pills that lower your blood sugar?
 - Have you taken your usual dose of insulin (or pills) today?
 - Have you eaten normally today?
 - Have you had any illness, unusual amount of activity, or stress today?

Focused History and Physical Exam

- Patients who have eaten but not taken insulin are more likely to have developed diabetic ketoacidosis.
- Patients who have taken insulin but have not eaten are more likely to be in insulin shock.
- The patient will often know what is wrong.
- Do not assume that diabetes is the cause of the problem.

Focused Physical Exam

- Focus on patient's mental status and ability to swallow and protect the airway.
- Obtain a Glasgow Coma Scale score.
- Other signs:
 - Tremors
 - Abdominal cramps
 - Vomiting
 - Fruity breath odor
 - Dry mouth

Baseline Vital Signs

- Hypoglycemia
 - Respirations = normal to rapid
 - Pulse = normal to rapid
 - Skin = pale and clammy
 - Blood pressure = low
- Hyperglycemia
 - Respirations = deep and rapid
 - Pulse = normal to fast
 - Skin = warm and dry
 - Blood pressure = normal

Interventions

- Conscious patient
 - If able to swallow without risk of aspiration, encourage him or her to drink juice or another drink that contains sugar.
 - Or administer oral glucose.
- Unconscious patient
 - Will need IV glucose
- When in doubt, consult medical control.

You are the Provider

(continued)

- You help the patient self-administer the entire tube of glucose.
- If the patient is hypoglycemic, how long should it take for this to begin to raise the patient's mental status?
- The patient has gotten argumentative and mildly combative. Is this expected?

You are the Provider

(continued)

- He becomes more alert.
- He tells you that he was driving home to eat because he realized that his blood sugar level was dropping.
- After a few minutes, he is fully alert and refuses transport.
- You remind him to eat a meal high in carbohydrates as soon as possible.

Detailed Physical Exam

- The patient may have sustained trauma or may have another metabolic problem; do not make assumptions.
- Perform a careful physical exam if time permits.

Ongoing Assessment

- Is the patient's mental status improving?
- Reassess ABCs, vital signs.
- If patient deteriorates, provide more glucose.
- Relay information to the hospital.
- Carefully document your assessment findings.
- Follow local protocols for refusals.



Administering Glucose (1 of 3)

- Names:
 - Glucose
 - Insta-Glucose
- Dose equals one tube
- Glucose should be given to a diabetic patient with a decreased level of consciousness.
- **DO NOT** give glucose to a patient with the inability to swallow or who is unconscious.

Administering Oral Glucose (2 of 3)

- Make sure the tube is intact and has not expired.
- Squeeze a generous amount onto a bite stick.



Administering Glucose (3 of 3)

- Open the patient's mouth.
- Place the bite stick on the mucous membranes between the cheek and the gum with the gel side next to the cheek.
- Repeat.



Complications of Diabetes

- Heart disease
- Visual disturbances
- Renal failure
- Stroke
- Ulcers
- Infections of the feet and toes
- Seizures
- Altered mental status

Seizures

- Consider hypoglycemia as the cause.
- Use appropriate BLS measures for airway management.
- Provide prompt transport.

Altered Mental Status

- Altered mental status is often caused by complications of diabetes.
- Ensure that airway is clear.
- Be prepared to ventilate and suction.
- Provide prompt transport.

Alcoholism

- Patients may appear intoxicated.
- Suspect hypoglycemia with any altered mental status.
- Be aware of the similarity in symptoms of acute alcohol intoxication and diabetic emergencies.

Relationship to Airway Management

- Patients may lose their gag reflex, causing them to be unable to guard their airway.
- Be ready to manage the airway.
- Place patient in lateral recumbent position and have suction available.