

## **32 BLS Blood Glucose Measurement**

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### ***32.1 Purpose and Expected Results***

Diabetes mellitus is an endocrine disorder, which may have autoimmune origins. Risk factors include genetics, diet, body mass, and pregnancy. Diabetes is characterized by a deficiency of circulating insulin and consequential compromise of glucose uptake at the cellular level. In an untreated patient, this is manifested by an abnormal increase in blood sugar level. A large and growing segment of the United States population is diabetic. Many diabetics are undiagnosed.

Diabetes is often categorized into two types, insulin dependent and not insulin dependent.

Type 1 diabetes is also known as insulin dependent diabetes mellitus (IDDM). The pancreas produces very little to no insulin. Adding insulin to the blood stream controls the disease process. Administering insulin poses risk in that the body's cellular demand for glucose is variable and sometimes difficult to predict. Taking too much insulin can cause pathologically low blood sugar. Taking too little insulin can leave the disease processes untreated.

Type 2 diabetes is also known as non-insulin dependent diabetes mellitus (NIDDM). The pancreas produces sufficient insulin to support cellular demand while blood sugar levels are controlled by diet, exercise, and (often) medication other than insulin.

In the prehospital setting diabetic emergencies are characterized by depressed or altered mental status due to a blood sugar concentration state that is too-high or too-low. Knowing which state leads to more definitive treatment.

Consistent with the Squad's goal of superior pre-hospital patient care, for treatment of a diabetic emergency, a properly trained EMT may and should measure blood glucose level and treat the patient in a manner consistent with the results of that measurement. The objective is to reverse a threat to life.

### ***32.2 Circumstances of Applicability***

1. A patient presents with, or develops, depressed or altered mental status.
2. A patient who is diabetic and whose blood sugar level is not known.

### ***32.3 Requisites***

- A patient who is any of:

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- Diabetic and blood sugar level is not known
- Exhibiting the signs and symptoms of depressed or altered mental status
- Normal ALS interventions cannot be performed in a timely manner
- Availability of a glucometer (blood sugar meter)
- An CFR or EMT trained in using the glucometer

### **32.4 Procedure Description**

Refer to New York State DoH BEMS policy statement 05-04. It may be found at: <http://www.health.state.ny.us/nysdoh/ems/policy/05-04.htm> at the latest version.

#### **32.4.1 Required Training**

All Squad members that provide patient care at the BLS level shall complete a training course approved by the Squad's Medical Director.

#### **32.4.2 Signs and Symptoms**

The signs and symptoms of a diabetic emergency include:

- Depressed or altered mental status; signs may include:
  - Irritable, agitated behavior
  - Irrational behavior
  - Confusion
  - Uncoordinated movement
  - Lethargic
  - Unconsciousness
  - Coma
- Breath odor that is sweet or fruity
- Tachypnea often with deep breaths
- Tachycardia
- Cool, clammy skin; perhaps diaphoretic
- Excessive thirst accompanied by frequent urination
- Nausea and perhaps vomiting
- Headache

#### **32.4.3 Protocol**

Should a glucometer not be available or not function properly, do not delay treatment or transport.

##### **32.4.3.1 Storage**

A glucometer kit will be kept in the "first in" bag. The glucometer kit will consist of a closable pouch or case that contains the following:

- A glucometer
- Test strips matching the glucometer
- Lancets
- Alcohol wipes
- Sterile gauze wipes

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- Sterile dressings

### **32.4.3.2 Measurement Procedure**

1. Take body substance isolation precautions.
2. Open the glucometer kit.
3. Select and then clean the puncture site (usually a finger tip) on the patient, with alcohol wipe.
4. Remove a test-strip from its container and insert it into the glucometer. The glucometer should activate. The glucometer should, after a self-test, indicate it is ready.
5. Verify that the puncture site is clean and dry.
6. Using aseptic technique prick the patient's skin at the puncture site with a disposable lancet.
7. Dispose of the lancet in a sharps container.
8. If necessary, develop a drop of blood using appropriate technique such as dangling the site and squeezing.
9. Wipe off the first drop of blood with sterile gauze and develop a second drop.
10. To the second drop of blood, touch the appropriate site on the test-strip, while it is inserted in the glucometer. The glucometer should indicate it is processing.
11. Cover the puncture site with a sterile dressing.
12. When a reading is presented on the glucometer, record the reading (mg/dL) and the time (24-hour).
13. Dispose of the test-strip.
14. Repackage the glucometer kit, replenishing items as necessary.

### **32.4.3.3 Documentation**

The following must be documented in the PCR (or ePCR):

- Indications for obtaining blood glucose measurement (history, signs, symptoms)
- Measurement results (each measurement, in vital signs section of an ePCR)
- All interventions (sugar or food given, when, what, how much)
- Results of the interventions (patient's response, how long it took)
- Any call for ALS (when)