General Medical:
Diabetic Emergencies: Hypo- and Hyperglycemia

Goal: To aid EMS Providers in the recognition and care of symptomatic hypo- and hyperglycemia
Inclusion Criteria: All patients who are symptomatic with weakness, dizziness, confusion, disorientation, syncope or loss of consciousness due to a known or suspected diabetic emergency. These include: symptomatic hypoglycemia and hyperglycemia associated with suspected diabetic ketoacidosis (DKA) (common) or Hyperosmolar Hyperglycemic State (HHS) (less common)
Exclusion Criteria: Consider treatment for asymptomatic patients with abnormal POC Glucose level
Refer to: Altered LOC, Neonatal, Seizure, Sepsis, Shock, Stroke and other symptom-specific CPGs

Symptomatic Hypoglycemia

Hypoglycemia Definition (POC Glucose):

Age	Non-Diabetic	Diabetic
Adult (at least 14 years of age)	Less than 80 mg/dL	Less than 110 mg/dL
Pediatric (1 month to 13 years of age)	Less than 70 mg/dL	
Newborn under 1 month of age	Refer to Neonatal CPG	

NOTE: Never administer dextrose or glucose to a patient who is not hypoglycemic. If the POC glucose is normal in a patient with altered level of consciousness, search for alternative causes (refer to the Altered LOC CPG).

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC
    a. Initiate continuous ECG monitoring
2. Assess and document Glasgow Coma Scale (GCS) and neurologic exam (refer to Stroke CPG)
3. Positioning:
    a. Trauma not suspected:
        i. Position of comfort or left lateral position
        ii. If there is evidence of shock, position the patient supine with the feet elevated
    b. Trauma suspected:
        i. Refer to Spinal Motion Restriction Policy and Trauma CPG
    c. Closely monitor airway status and respiratory effort
4. Administer supplemental oxygen to maintain SpO_2 of at least 94%, with continuous monitoring
5. Perform and document a POC Glucose analysis
    a. Adult hypoglycemic patient who is responsive AND able to protect his/her airway:
        i. Administer 1 tube (15 g) oral glucose SL
        ii. If symptoms persist after 10 minutes, administer a 2nd tube (15 g) of oral glucose SL
        iii. Perform and document a repeat POC Glucose analysis and patient's response to treatment

b. **Pediatric (1 month to 13 years of age) oral glucose dose:**
i. Administer ¼ to ½ tube of oral glucose SL
ii. If symptoms persist after 10 minutes, administer additional ¼ to ½ tube SL
iii. Perform and document a repeat POC Glucose analysis

6. Perform and document Secondary Survey and SAMPLE history
7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

8. Establish IV/IO access if patient is hypotensive, in shock, unresponsive to oral glucose or unable to protect his/her airway

9. If an adult patient at least 14 years of age is hypoglycemic and level of consciousness does not improve after oral glucose, OR if oral glucose could not be administered, administer 125 mL of D10W IV/IO over 10 minutes.
    a. Monitor for improved level of consciousness and resolution of symptoms
    b. Treatment option, **only if D10W is unavailable**: Administer 50 mL of 25% Dextrose (D25) IV/IO
        i. Waste 25 mL of from an amp of D50 and replace with Normal Saline

c. **Infant and Child (1 month to 13 years of age) dextrose dose:**
i. 2 mL/kg of D10W IV/IO over 10 minutes
ii. Treatment option if D10W is unavailable: Waste 40 mL per amp of D50 and replace with Normal Saline – administer 2 mL/kg
iii. Monitor for improved level of consciousness and resolution of symptoms

10. If level of consciousness and symptoms do not improve, administer an additional 125 mL of D10W IV/IO over 10 minutes.
    a. Monitor for improved level of consciousness and resolution of symptoms
    b. Treatment option, **only if D10W is unavailable**: Administer 50 mL of 25% Dextrose (D25) IV/IO
        i. Waste 25 mL of an amp of D50 and replace with Normal Saline

c. **Pediatric repeat dextrose dose: As above, under Section 8.c**

11. Consider glucagon (1 mg IM or IN) as *third-line* treatment for adults at least 14 years of age:
    a. ONLY if BOTH of the following conditions are met:
        i. Oral glucose cannot be administered due to patient's inability to protect his/her airway; **AND**
        ii. Reasonable attempts at both IV and IO access are unsuccessful
    b. Monitor for improved level of consciousness and resolution of symptoms
    c. May repeat once after 20 minutes

d. **Pediatric glucagon dose:**
i. Infants 1 month to 1 year of age: 0.5 mg IM or IN
ii. Children 1 year to 13 years of age: 1 mg IM or IN
iii. Monitor for improved level of consciousness and resolution of symptoms
iv. May repeat once after 20 minutes

12. For all patients treated for symptomatic hypoglycemia, perform and document a repeat POC glucose analysis:
    a. If normal and patient is improved, do not administer additional glucose, dextrose or glucagon
    b. If normal and patient remains symptomatic, search for other causes of altered level of consciousness
    c. If hypoglycemia persists, consult BioTel for authorization for additional dextrose or glucagon dosing, and prepare for transport to an appropriate receiving facility
13. Monitor vital signs and GCS, and initiate transport
    a. *All patients treated for symptomatic hypoglycemia should be strongly encouraged to accept transport, especially elderly patients and those with cardiovascular and other comorbidities*
    b. **NOTE:** The following patients ***shall be*** transported to an appropriate receiving hospital:
        i. Patients treated by EMS for symptomatic hypoglycemia who take sulfonylureas, such as:
            1. Glipizide (Glucotrol®)
            2. Acetohexamide (Dymelor®)
            3. Chlorpropramide (Diabinese®)
            4. Tolbutamide (Orinase®)
            5. Tolazamide (Tolinase®)
        ii. Patients treated by EMS for symptomatic hypoglycemia with glucagon (IM or IN)
        iii. Those who refuse transport should be considered as refusing "Against Medical Advice" (AMA), for which appropriate documentation in the ePCR is required
14. For additional patient care considerations not covered under standing orders, consult BioTel

Symptomatic Hyperglycemia (e.g. DKA and Hyperosmolar Hyperglycemic State)

Hyperglycemia Definition and Background:

- There is no standardized POC Glucose level to define symptomatic hyperglycemia. Confirmation of Diabetic Ketoacidosis (DKA) or Hyperosmolar Hyperglycemic State (HHS) requires in-hospital diagnostic testing. Definitive care for the underlying or precipitating cause likewise requires hospital evaluation.

- DKA may be the presenting clinical picture for children with previously undiagnosed Type I diabetes. Hyperosmolar Hyperglycemic State (HHS) is a life-threatening emergency in Type II (elderly) diabetics.

This CPG is intended to aid EMS Providers in the recognition and resuscitation of patients who may be suffering from acute, potentially life-threatening illness associated with extremely high POC Glucose levels.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC
    a. Initiate continuous ECG monitoring
    b. Assess for signs and symptoms of hypovolemic or septic shock (refer to Shock CPG)
2. Assess and document Glasgow Coma Scale (GCS) and neurologic exam (refer to Stroke CPG)
3. Positioning:
    a. Trauma not suspected:
        i. Position of comfort or left lateral position
        ii. If there is evidence of shock, position the patient supine with the feet elevated
    b. Trauma suspected:
        i. Refer to Spinal Motion Restriction Policy and Trauma CPG
    c. Closely monitor airway status and respiratory effort
4. Administer supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
5. Perform and document a POC Glucose analysis
6. Perform and document Secondary Survey and SAMPLE history

Advanced Level

7. Initiate continuous waveform capnography monitoring
8. Obtain and document POC lactate measurement, *if available*
9. Establish IV/IO access and administer Normal Saline 20 mL/kg **(but no more than a total of 1000 mL (1L))**
10. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
11. If hypoperfusion persists, administer 1 additional 20 mL/kg bolus **(but no more than a total of 1000 mL (1L))**

11. **Pediatric fluid resuscitation if DKA is suspected (even in absence of prior history of diabetes):**
a. Contact BioTel for authorization **before** administering additional fluid after the initial bolus

12. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
13. If hypoperfusion persists after 2 fluid boluses (1 bolus for pediatrics if DKA is suspected), consult BioTel for further guidance
14. Perform and document a repeat POC Glucose analysis and neurologic exam (including repeat GCS)
15. Treat suspected sepsis per Sepsis CPG and treat shock per Shock CPG
16. Initiate transport as soon as possible
17. For additional patient care considerations not covered under standing orders, consult BioTel