Hyperglycemia Hyperosmolar Syndrome Pathway

**Suspected Hyperglycemia Hyperosmolar Syndrome (HHS)**

**Signs/symptoms:**
- Extreme thirst
- Frequent urination
- Confusion
- Vision changes

**Other considerations:**
- History of diabetes, either type 1 or 2
- Absence of Kussmaul breathing
- Fruity breath
- Abdominal pain

**Triage Level 2**

**Obtain EPOC STAT**

**Vital signs and neuro checks q1h**

**Did EPOC results indicate diabetic ketoacidosis (DKA)?**

- **Follow DKA Pathway**
  - *Consider mixed picture*

**Use ED HHS order set**

**Obtain the following STAT:**
- Chem 8 (BMP)
- VBG
- Serum osmolality
- Calcium
- Phosphorus
- Magnesium
- Creatinine kinase
- Beta-hydroxybutyrate (BHB)

**Place 2 IVs**

- NPO
- Administer 20mL/kg (up to 1L) lactated ringers (LR) or normal saline (NS) over 1 hour

**Evaluate and treat any co-morbid diagnosis**

- **Repeat blood glucose q1h**
- Do NOT start insulin infusion

- **Start 2 bag system:**
  - (D: D10 + ¾ NS + 20 K phos + 20 K acetate)
  - (S: ¾ NS + 20 K phos + 20 K acetate)

- Repeat the following q2h
  - Chem 8 (BMP)
  - VBG
  - Serum osmolality
  - Calcium
  - Phosphorus
  - Magnesium
  - Creatinine kinase

- Vital signs every 15 minutes
- Monitor urine output every 30 minutes
- Replace 1:1 with LR over the next 30 minutes (in addition to 2 bag system resuscitation)

**Does patient require additional fluid bolus?**

- **Signs of shock (HR, BP, altered mental status, significant dehydration)**
  - Repeat blood glucose
  - Repeat LR or NS fluid bolus

**Admit to PICU**

- Management per ICU physician
  - Start insulin infusion
  - Start an anticoagulant
  - Place Endocrinology consult, if not already completed

**Transfer to Med/Surg once meet the following criteria:**
- No fluid bolus in 12 hours
- Hemodynamically stable for at least 12 hours
- Normal vital sign trend for age/gender without interventions or medications
- OK with orogastric suction
- Sodium within normal limits
- Serum creatinine ≤ 3.0
- Ready for transition off insulin drip

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**HHS definition:**
- Glucose > 600mg/dL
- HCO3 > 15mEq/L
- Serum osmolality > 320
- Small to zero ketones in urine (<30mg/dL)
- Beta-hydroxybutyrate (BHB) ≤ 1 mmol/L

**Exclusion criteria:**
- HCO3 < 15mEq/L
- Large ketones in urine (>80mg/dL)
- Beta-hydroxybutyrate (BHB) > 1 mmol/L

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**Disclaimer:** Pathways are intended as a guide for practitioners and do not indicate an exclusive course of treatment nor serve as a standard of medical care. These pathways should be adapted by medical providers, when indicated, based on their professional judgement and taking into account individual patient and family circumstances.

ChildrensNebraska.org/Pathways

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