## Diabetic Ketoacidosis PICU Management

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL

Inclusion Criteria: patient of any age presenting with potential Diabetic Ketoacidosis(DKA)

[Consider if history of: weight loss, vomiting, abdominal pain, polyuria, polydipsia, nocturia; Consider if exam findings of: tiredness, Kussmaul respirations, dehydration, mental status changes, abdominal pain (can be severe and present as acute abdomen)]

Exclusion Criteria: well-appearing, HCO3 >18 mmol/L

### INITIAL MANAGEMENT

Establish DKA diagnosis (defined by pH <7.3, HCO3 <15 mmol/L, blood sugar >200, ketones - blood or urine)

\*Note: Hyperglycemic Hyperosmolar Syndrome (HHS) is a spectrum with DKA, and may not have acidosis and ketones, but will have severe hyperglycemia and dehydration. Discuss care with PICU/Endocrine.

### LABS:

- Chem 10, Blood gas, CBC w diff, HbA1C, STAT B-hydroxybuterate, UA
- Repeat Chem 7/VBG after initial NS bolus

If newly diagnosed diabetes, add:

- Free T4, TSH, is let cell antibody, insulin antibody, glutamic acid decarboxylase antibody
- Consider C-peptide if BMI >95<sup>th</sup> percentile

### FEN:

Make NPO

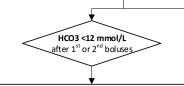
- Give 0.9% NS bolus 10-20 mL/kg over 30-60 min
  - Additional fluid bolus only if signs of shock (hypotension, tachycardia, delayed cap refill, oliguria)
  - Caution needed when using depressed mental status as marker of shock, as it may represent cerebral edema
  - Large volume fluid resuscitation may be associated with increased risk of cerebral edema
- Post bolus: start NS at minimum of 1.5x maintenance until appropriate fluids (per PICU/Med Surg care) become available

### **NURSING CARE:**

- Establish PIV x2
- If oliguria present, insert foley catheter
- Strict I&O
- Bed Rest

### \* PICU admission considerations:

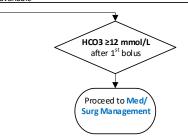
- Persistent, severe metabolic acidosis with serum HCO3 <12 mmol/L after initial NS bolus
- Persistent hypokalemia or hyperkalemia with serum K+ <3 mmol/L or >6 mmol/L
- Altered mental status with GCS <11 after initial therapy
- Persistent signs of poor cardiac output, unresponsive to initial rehydration



### See PICU admission considerations<sup>3</sup>

Admit to PICU and follow PICU management below

- Order Regular insulin 1 unit/mL Infusion rate: 0.1 unit/kg/hour
  - DO NOT GIVE BOLUS INSULIN
- Continue NS IV infusion (minimum 1.5x maintenance)





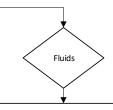
- Hourly neuro assessment
- If pH <7.3, K+ >6: continuous monitoring

### Strict I&O

# Insulin Labs

Serum glucose q1hr Serum lytes q2hr





Minimum of 1.5x maintenance (max 2x maintenance)

### Base Fluid Type:

- 0.9% NS
- May switch to 0.45% NS after 24 hours or if Na >150 with normal mental status

### Amount of glucose added to fluid: (use two bag protocol)

[Bag A: no dextrose; Bag B: D10W]

- If glu >300: run Bag A at 100%
- If glu 200-300: run Bag A at 50%; run Bag B at 50%
- If glu <200: run Bag B at 100%

### Amount of K+ added to fluid:

(divide equally between KPhos and KCI)

- If K+ <3 mmol/L: 60 mEg [call PICU]
- If K+ 3-5 mmol/L: 40 mEq
- If K+ 5-5.5 mmol/L: 20 mEq
- If K+>5.5 mmol/L, no void, or urine rate <1 mL/kg/hr: no K+ added

### Always monitor for Cerebral Edema and notify the PICU attending if s/s present!

### Signs/Symptoms:

HA, change in neuro status (restlessness, irritability, drowsiness), inappropriate slowing of HR or rise of BP

### Treatment:

- (1) Hypertonic Saline (3%) 1.25 2.5 mEq/kg (2.5-5 ml/ kg) IV (over 5 min for acute herniation; over 10 min for increased intracranial pressure) OR Mannitol 0.25 g/kg over 30 minutes (can be repeated every 6-8 hours) (2) Ensure pt on 0.9% NS fluids
- (3) If GCS <11 after therapy, consider ET intubation (4) Consider head CT
- Do not give sedating meds outside the setting of intubation (may lead to rise of PCO2 and herniation)

Therapy should always precede imaging!

If no improvement in mental status, repeat: Hypertonic Saline (3%) 1.25 - 2.5 mEg/kg (2.5-5 ml/kg) IV (over 5 min for acute herniation; over 10 min for increased intracranial pressure) OR Mannitol 0.25 g/kg over 30 minutes

Blood gas q2hr if pH kg/hr Mg/Phos q8hr HCO3 ≥15 X2? Ongoing PICU care Proceed to DKA resolution and ongoing management