

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, moderate to large ketones – blood¹ 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, hemoglobin A1c; POCT blood glucose and ketones¹, UA
- Repeat Chem 7/VBG after initial NS bolus

If newly diagnosed diabetes (and not done in ED) add:

- Free T4, TSH, islet cell antibody, insulin antibody, ZnT8 antibody, glutamic acid decarboxylase antibody
- Consider C-peptide if BMI >95th percentile

FEN:

- Make NPO
- Give 0.9% NS bolus 10-20 mL/kg over 30-60 min
 - Additional fluid bolus *only* if signs of worsening dehydration or shock (hypotension, tachycardia, delayed cap refill, oliguria)
 - Caution needed when using depressed mental status as marker of shock, as it may represent DKA associated brain injury
 - 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:

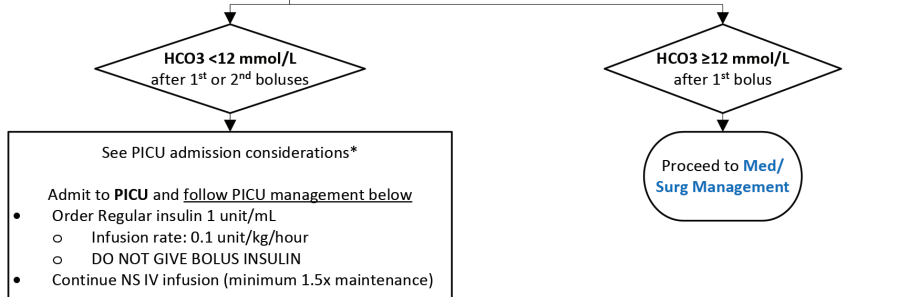
- Establish PIV x2
- If oliguria present, insert Foley catheter
- Strict I&O
- Bed rest

¹POCT Blood Ketone Interpretation:

- <0.6 mmol/L: Low
- 0.6-1.5 mmol/L: Moderate
- >1.5 mmol/L: Large

*** 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



Monitoring

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

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:

- 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)
- Ensure patient on 0.9% NS fluids
- If GCS <11 after therapy, consider ET intubation
- 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 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

Labs

- Serum glucose q1hr
- Serum lytes q2hr
- Blood gas q4hr if pH <7.25
- Mg/Phos q8hr
- POCT blood ketones q2hr

Insulin

- Continue insulin infusion at 0.1 unit/kg/hr
- Consider 0.05 unit/kg/hr to avoid hypoglycemia or if initial pH >7.15

Fluids

Rate:
 Minimum of 1.5x maintenance (max 2x maintenance)

Base Fluid Type:
 (Use two bag protocol)

- Bag A 0.9% NS (no dextrose), Bag B D10NS
- May switch Bag A to 0.45% NS after 24 hours or if Na >150 with normal mental status

Amount of glucose needed:
 [Bag A: 0.9% NS (no dextrose); Bag B: D10NS]

- 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 KCl)

- If K+ <3 mmol/L: 60 mEq [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

HCO₃ >15 and blood ketones <1.5 x1

No: Ongoing PICU care

Yes: Proceed to DKA resolution and ongoing management