CLINICAL PATHWAY:

Diabetes Ketoacidosis (DKA) Emergency Room Algorithm

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

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 – blood[1] 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 ketones[1], UA
- **Repeat Chem 7/VBG after initial NS bolus**

If newly diagnosed diabetes, 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

[1]POCT Blood Ketone Interpretation:
- <0.6 mmol/L: Low
- 0.6-1.5 mmol/L: Moderate
- >1.5 mmol/L: Large

Reassessment: any of the following present?
- 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 after initial therapy
- Persistent signs of poor cardiac output, unresponsive to initial rehydration

Yes

- Arrange for Admit to PICU
- 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) until DKA specific IVFs arrive
- Order DKA specific IVFs in preparation for PICU admission

Proceed to PICU Management

No

Proceed to Med/Surg Management

Always monitor for DKA Associated Brain Injury 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: Therapy should always precede imaging!
- (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 patient 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)**

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

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