**UNMH Pediatric Diabetic Ketoacidosis Pathway**

**DKA Triage Screening Tool**

<table>
<thead>
<tr>
<th>History</th>
<th>Known or SUSPECTED Type I Diabetes Mellitus</th>
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<tbody>
<tr>
<td>PLUS ONE OF</td>
<td>Abdominal Pain, Altered Mental Status*, Extreme Thirst, Fatigue, Frequent Urination, Kussmaul Breathing, Respiratory Distress*, Vomiting, Weight Loss</td>
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</tbody>
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**DKA TREATMENT GOALS:**
Rapid diagnosis of DKA
- Insulin Drip for DKA
- Hourly glucose checks on insulin drip
- Use 3-bag system
- Do not drop glucose > 100 per hour
- Appropriate disposition No bicarbonate treatment

**PHYSICIANS**
- USE DKA POWERPLAN
- Order insulin drip, labs, and TWO bags of IV fluids! (details next page)
- See additional treatment (next page)

**NURSES**
- Use 3-bag system (on right)
- Finish bolus before starting insulin
- Hourly POC blood sugars
- Q15 min Neuro checks for first hour
- Notify MD if glucose drops > 100/hr

**Fluid Rate (FR) = 1.5 x maintenance**
- Insulin MUST run with both fluids!
- Do NOT slow insulin rate!

**PICU Criteria**
- pH < 7.1
- K+ < 2.5
- Age < 2 years
- Profound shock
- Altered Mental Status
- Dysrhythmia
- Intubation
- Cerebral Edema
- Floor patients must have a bed on PSCU/6-East!

**3-Bag System and Starting Rates**

<table>
<thead>
<tr>
<th>Bag 1</th>
<th>Bag 2</th>
<th>Bag 3</th>
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<tr>
<td>Insulin</td>
<td>NS +/- additives</td>
<td>D10 NS +/- additives</td>
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</table>

**Positive = MD/RN SWARM**

**Blood Glucose > 200 AND SWARM concerning for DKA**

**Altered Mental Status? Seizure? Shock? See critical care strategies on last page**

**Triage B**

- 10-20 mL/kg NS Bolus (over 1 hr*)
- iStat Chemistry, iStat gas

**Lantus SQ OK**

**Exit Guideline**
- Diabetic NOT in DKA vs Alternate Diagnosis*

**Exit Guideline**
- Diabetic NOT in DKA vs Alternate Diagnosis*

**Bag 1**
- > 300
  - 0.1 Units/kg/hr
- 150-300
  - ½ FR
- <150
  - 0

**Bag 2**
- FR
- 0

**Bag 3**
- FR
- ½ FR

**Note*: Ketones in urine is needed for diagnosis, but treatment may start before confirmation at physician discretion.
H&P AND TREATMENT INFORMATION

HISTORY AND PHYSICAL

Review of Systems
- Polyphagia, Polydypsia, Polyuria, Weight Loss, Anorexia, Vomiting, Fatigue, Malaise
- Insulin Use, most recent dose, insulin pump
- Home glucose/ketone measurements
- Age at dx, prior hospitalizations, previous DKA
- Infectious sx, Ingestions, Trauma
- Risk of Pregnancy, STI

Known Diabetic

Other

Teensage females

Physical Exam
- Airway
- Breathing: Tachypnea, Kussmaul breathing
- Circulation: Capillary refill, pulses
- Neuro: Pupils, CN exam, motor, GCS, Mental Status
- Vital Signs (including temperature)

ADDITIONAL TREATMENT

Assure good IV access but avoid central lines due to risk of thrombus

Neurologic assessments every 15 minutes for first hour or until stable

Reeval for need for 2nd bolus
Start 1.5 MIVF NS until 3-bag system ready

Start insulin infusion at least 1 hour AFTER 1st bolus started1,4,6

Add glucose to fluids when blood sugar drops below 300 mg/dL or if dropping > 100/hr

0.2 U/kg Lantus now if new diabetic. Otherwise order their regular home dose.

Do NOT give bicarbonate OR insulin boluses1,4

Add antibiotic coverage if febrile

ORDER INFORMATION

IV FLUID ORDERS1

ALWAYS ORDER a bag with AND a bag without dextrose!

K > 5.5

< 35 kg
- Normal Saline AND D10 NS

> 35 kg
- Normal Saline AND D10 NS

K < 5.5

< 35 kg
- Normal Saline AND D10 NS + 20 mEq/L KCl + 20 mEq/L KPhos

> 35 kg
- Normal Saline AND D10 NS + 40 mEq/L KCl + 20 mEq/L KPhos

IF K < 2.5 or > 5.5 order an EKG
K Acetate instead of KCl is allowed

IF Severe DKA add a Lactate

USE THE FOLLOWING INITIAL RATE

POC Glucose
- NS +/- additives
- D10 NS +/- additives

> 300
- 1.5 maintenance
- Bag at bedside

150 - 300
- 0.75 maintenance
- 0.75 maintenance

< 150
- Bag at bedside
- 1.5 maintenance

Nurses need BOTH bags to start insulin drip
Specialized fluids take time, start with NS at 1.5 maintenance while waiting for insulin and supplemental fluids

LAB ORDERS

All

- VBG
- Chem 7, Mg, Phos
- CBC with diff
- Hemoglobin-A1c
- Ionized Calcium (iCa)
- Urinalysis (UA)
- Q1 hour POC Glucose

If New Diabetic

- Islet Cell Antibodies
- Insulin antibodies
- TSH
- FT4
- Celiac Disease Reflex Panel

If Severe DKA add a Lactate

ORDER INFORMATION

H&P AND TREATMENT INFORMATION
**Cerebral Edema Treatment:**

- Elevate head of bed
- 3% NS over 30 minutes
- Mannitol
- Consider a slower initial insulin drip rate
- Consider head CT AFTER initial treatment

**Shock Treatment:**

- Bolus Insulin administration
- Insulin infusion within 1 hour of 1st fluid bolus
- Bicarbonate administration
- 5 mL/kg
- 0.5g/kg
- 0.05 units/kg/hr

- NS or LR boluses until perfusion restored
- 20 mL/kg (up to 3)
- Dopamine (Cold shock)
- Epinephrine (Cold shock)
- Norepinephrine (Warm shock)
- Fever

- See UNMH PED Sepsis Pathway

**Possible alternate diagnoses:**

- Stress response due to bacteremia, pneumonia, sepsis, metabolic disorder, or trauma

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**Cerebral Edema Risk Factors:**

- Age < 3 years
- Prior Hx of DKA
- pH < 7.0
- Na fails to correct as sugar ↓
- Initial glucose > 1000 mg/dL

**Cerebral Edema Diagnosis:**

1 Major + 2 Minor or 1 Diagnostic + 2 Major

**Diagnostic**

- Abnormal verbal/motor to pain
- Posturing (e.g. decorticate)
- CN Palsy (usually III, IV, or VI)
- Cheyne-Stokes respirations

**Major**

- Altered/fluctuating consciousness (GCS ≤ 13)
- Sustained bradycardia
- Age-inappropriate incontinence

**Minor**

- Vomiting
- Headache
- Age < 5 years
- Does not easily wake
- Diastolic bp > 90 mmHg

**Cerebral Edema Pathways**

- Call PICU attending if intubation or treatment for cerebral edema is required

**Diabetic Ketoacidosis Criteria**

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<tr>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
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<td>pH 7.21 – 7.3 OR CO₂ 11-15</td>
<td>pH 7.11 – 7.2 OR CO₂ 6-10</td>
<td>pH &lt; 7.1 OR CO₂ &lt; 5 OR Altered Mental Status</td>
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**References:**


