# Diabetic Ketoacidosis

## Clinical Practice Guidelines

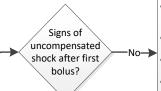
Patient arrives with

clinical concern for DKA\*(see inclusion criteria): Order BMP, VBG, urine ketones

Patients with altered mental status should be excluded from this guideline, only receive IV fluids with normal saline, and be discussed with endocrinology

If patient meets inclusion criteria: Consult Endocrine

Begin rehydration with Normal Saline (NS) 20 mL/kg bolus (or 1L if >/=50kg)



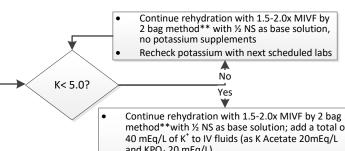
Yes

Discuss with Endocrine and PICU Check neuro (GCS) status every hour

- Check bedside glucose every hour
- Start ½ Normal Saline (0.45% NS) at 1.5-2.0x maintenance IV fluid (MIVF) via 2 bag method\*\*
- Glucose infusion rate determined by the patient's blood sugar\*\*
- BMP q6h on 5-11 schedule as medically appropriate
- Continue long acting insulin regimen if known diabetic
- If new onset or on insulin pump discuss with endocrinology for long acting insulin plan as well as plan for new pump site

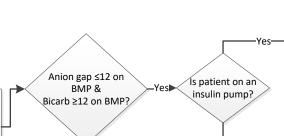


Begin insulin infusion at 0.1 units/kg/hr



Continue rehydration with 1.5-2.0x MIVF by 2 bag method\*\*with ½ NS as base solution; add a total of and KPO<sub>4</sub> 20 mEq/L)

When no vomiting in 4hrs and patient is alert, may have 1ml/kg of sugar free clears, up to 60ml/hr



Transition to insulin pump

- Ensure basal rate has been on for at least 30 minutes prior to meal
- Check baseline pre-meal glucose
- Allow patient to eat appropriate diet
- Give meal insulin through insulin pump
- Stop insulin infusion 30 minutes after meal insulin given through pump, and switch to dextrose free fluids

Transition to scheduled SQ insulin

- Check baseline pre-meal glucose
- Allow patient to eat appropriate diet
- Give scheduled SQ insulin

• Ensure long acting insulin given within last 24 hours

**Exclusion Criteria** 

 Stop insulin infusion 30 minutes after SQ insulin given if eating, and switch to dextrose free fluids

#### \*Inclusion Criteria

Patient must meet all of the following:

- pH< 7.3
- Bicarb on BMP ≤ 15
- Glucose ≥ 200
- Ketosis by urine or blood testing (send with first void, but do not delay initiation of insulin infusion if patient meets other criteria for DKA)

AND any of the three listed below:

- History of previously diagnosed Insulin Dependent Diabetes Mellitus (IDDM)
- History of significant Non-Insulin Dependent Diabetes Mellitus
- History consistent with new onset IDDM (polyuria, polydipsia, polyphagia)

#### \*\*2 Bag Method: Total IV Fluid (TIVF) = 1.5-2xMIVF

No

Patient's Glucose	1 <sup>st</sup> Bag (D₀ solution)	2 <sup>nd</sup> Bag (D <sub>10</sub> solution)	If patient meets any of the following exclude from protocol and discuss treatment plan with Endocrinology
BG <200	0% TIVF	100% TIVF	<ul> <li>Age &lt; 3 years</li> <li>Altered mental status</li> <li>If corrected sodium ≤ 130 mEg/L</li> <li>If corrected sodium ≥ 150 mEq/L</li> <li>Corrected plasma sodium = measured plasma or serum sodium concentration + (2*(serum glocose-100)/100)</li> </ul>
BG 200-300	50% TIVF	50% TIVF	
BG >301	100% TIVF	0% TIVF	
BG <70	<ul> <li>Maintain insulin infusion</li> <li>Give 15 g carbs (ex. juice cup), If altered mental status give D25</li> <li>Check blood glucose in 15 minutes</li> </ul>		Hyperosmolar Hyperglycemic Syndrome with or without DKA     Significant dehydration/ketosis without insulin deficiency from any other cause, such as:

#### Warnings and emergency therapies

Symptomatic Cerebral Edema from DKA is a clinical emergency Pediatric DKA is associated with a higher incidence of cerebral edema and stroke

deficiency from any other cause, such as: -Appendicitis or other abdominal crisis

- -Steroid induced hyperglycemia
- -Ketosis from other metabolic/genetic causes
- Monitor electrolytes during treatment closely, rapid changes in glucose and/or sodium may indicate rapid fluid shifts and increase risk for cerebral injury
- For concern of cerebral edema, consider hypertonic saline administration: 3-5ml/kg (1.5-2.5 meg/kg) over 10 minutes (max of 500ml), use caution if corrected Na ≥ 150mEq/L as hypertonic saline may worsen hypernatremia/hyperosmolarity
- If fever of > 38 C is present, the work up should include a fever/infection evaluation while treating DKA

Bicarbonate administration is associated with increased morbidity/mortality from cerebral edema and should be reserved for dire situations after consultation with a Pediatric Endocrinologist

# **Diabetic Ketoacidosis**

### **Clinical Practice Guidelines**



## **REFERENCES**

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