

# VCMC / SPH CLINICAL PRACTICE GUIDELINE

## Management of Pediatric Patients in Diabetic Ketoacidosis

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The contents of this clinical practice guideline are to be used as a guide. Healthcare professionals should use sound clinical judgment and individualize patient care. This CPG is not meant to be a replacement for training, experience, CME or studying the latest literature and drug information.

The acute management of Diabetic Ketoacidosis (DKA) in children is different from that of adults, as children are at risk for acute cerebral edema, with its accompanying high morbidity and mortality.

### DO NOTS:

Do not give more than 20 mL/kg as a single fluid bolus

Do not give more than a total of 30 mL/kg of bolus fluids unless the patient is in shock.

**Do not give bolus IV insulin.**

**Do not give boluses of sodium bicarbonate. Bolus of sodium bicarbonate should only be used for patients with severe acidosis (pH<7.0) and have been associated with increased risk of cerebral edema.**

Do not start insulin until a fluid bolus has been given and maintenance fluids begun. This may wait until admission to the hospital if this occurs within 2 hours of admission to the ED.

### Initial Approach

1. Obtain and monitor vital signs, including blood pressure, on all patients.
2. Do a bedside glucose determination to determine glucose level.
3. Assess the degree of hydration and mental status. Obtain a urine sample for glucose and ketones.
4. Draw blood for electrolytes, BUN, pH (venous or arterial), and CBC.
5. Start an intravenous line and give 10 mL/kg of normal saline over 30 minutes.
6. Contact the pediatric hospital service as soon as possible. Patients are then stratified by the degree of acidosis.

### Mild: pH>7.25, CO<sub>2</sub>>12, no alteration of mental status, dehydration < 10%.

1. Begin IV maintenance and replacement fluids with half normal saline at a rate of 1x maintenance fluids (2500 mL/m<sup>2</sup>/24 hours)
2. Begin an insulin drip at 0.08-0.1 units/kg/hour if the patient is in the ED for 2 hours.
3. Add potassium chloride 3mEq/kg/24 hour within 2 hours of admission to the ED or when insulin has been started.
4. Follow blood glucose, pH or CO<sub>2</sub> every hour, electrolytes at 2 hours and then every 4 hours.
5. If the blood sugar is below 400 mg/dL and the patient is being given insulin, add 5% dextrose to the IV solution. If the blood sugar is 250 mg/dL or below, add 10% dextrose.

### Moderate: pH 7.15-7.25, CO<sub>2</sub> 8-12, patient is lethargic, dehydration 10-15%.

1. Give a bolus of 10 mL/kg of normal saline. This may be repeated.
2. Consider the use of normal saline or 2/3 normal saline for maintenance plus replacement fluids at a rate 1x maintenance fluid requirements.
3. Begin an insulin drip at 0.1 units/kg/hour if the patient is in the ED 2 hours.
4. Add potassium chloride at 3-5 mEq/kg/24 hours within 2 hours of admission to the ED.
5. Follow laboratory parameters as above.
6. Follow guidelines for addition of dextrose to the IV fluids as above.

### Severe: pH <7.15, CO<sub>2</sub> <8, altered mental status, dehydration >15% or signs of shock

1. Give a bolus of normal saline at 20 mL/kg. Do not give more unless there is evidence of shock.
2. Continue normal saline at a rate of 1.5 x maintenance fluids
3. Monitor vital signs continuously.
4. Arrange for an ICU bed as soon as possible.
5. Begin an insulin drip at 0.1units/kg/hour within 2 hours of admission to the ED.
6. Add potassium chloride at 3-5 mEq/kg/24 hours within 2 hours or when insulin has been started.
7. Monitor laboratory parameters as above.
8. Obtain a bedside glucose every 30 minutes but be aware that many meters do not read above 600mg/dL. If meter reads critically high, obtain serum glucose.
9. Follow guidelines for addition of dextrose to the IV fluids as above.