

CPEG Pediatric DKA Algorithm: Ongoing Management

Refer to [TREKK Pediatric DKA Algorithm](#) for initial management

Pediatric DKA patients should be managed in conjunction with a pediatric diabetes specialist

DKA: Monitoring

Ongoing Monitoring (until resolution of acidosis)

- **Q1H:** HR, BP, POC blood glucose (BG), neurovitals, fluid ins and outs
 - If any change in mental status, go to DKA with suspected cerebral injury
- **Q1-2H x 2 then Q1-4H:**
 - Blood gas, BG, Na, K, Cl, HCO₃, urea, creatinine, urine ketones
 - Optional: Ca, Phos
 - Calculate anion gap and consider adding serum β-hydroxybutyrate (BOHB) to assess acidosis and guide weaning of insulin infusion

To distinguish ongoing DKA from hyperchloremic acidosis:

	Anion gap	BOHB
DKA	>12	>1 mmol/L
Hyperchloremic acidosis	≤12	<1 mmol/L

DKA: Ongoing Fluid Management

RATE: Rehydration Table : Ongoing IV Fluids (from TREKK DKA Algorithm)

Weight mL/kg/hr	<10 kg	10 to <20 kg	20 to <40 kg	40 kg or more
	6.5	6	5	4 (MAX 500 mL/hr)

3 principal elements of IV fluids to consider:

a) IV Solution:

- Rehydrate with IV NS or RL. Consider changing to solution containing 0.45% NaCl (to reduce the risk of hyperchloremic acidosis)

b) Potassium

- If K < 5.5 mmol/L, add **40 mmol/L KCl** to IV fluid
- Optional 50:50 mix of 20 mmol/L KCl plus 20 mmol/L KPhos

Note: Patients in DKA are at high risk of HYPOkalemia. Frequent monitoring and attention to serum K is essential. If HYPOkalemia persists despite maximum rate of K replacement (60 mmol/L in peripheral IV), then the insulin infusion rate should be held if K < 3.5 mmol/L. Also consider oral supplements.

c) Dextrose

Change to D5 NS/½NS/RL or D10 NS/½NS/RL

- BG 14–17 mmol/L **OR**
- BG decreasing >5 mmol/L/hour

Insulin

- Dilute 50 units of regular insulin in 50 mL NS for 1 unit/mL. Flush tubing with 5 mL of insulin solution
- **Dose: 0.1 units/kg/hour****
 - Continue this dose until DKA corrected (pH >7.30, HCO₃ >18 mmol/L, BOHB <1 mmol/L and/or anion gap ≤12 mmol/L)
 - Target glucose of 8–14 mmol/L

Note: Patients in DKA are at risk of persistent hyperchloremic metabolic acidosis. BOHB & AG are better indicators of DKA correction than pH & HCO₃ alone

- Convert to SC insulin once DKA is corrected and patient able to tolerate oral fluids. If this occurs between usual meal insulin times, ↓ insulin infusion by 25–50% q1–2 hours to keep BG in target range until insulin is due
- Discontinue insulin infusion and IV fluids 15–30 minutes after SC rapid-acting insulin is given

** In very young patients, those trending toward HYPOkalemia, or correcting acidosis but inability to maintain BG with D12.5% solution, consider rates of insulin 0.05 units/kg/hr.

DKA with Suspected Cerebral Injury

Recognition:

- May be clinically apparent at presentation, or develop within first 12–24 hours of treatment
- Risk factors for cerebral injury:
 - Greater acidosis (lower pH and pCO₂)
 - More severe dehydration
 - Young age (<5 years)
 - New-onset diabetes

Warning signs:

- GCS ≤13, severe/progressive headache, focal neurological signs, incontinence, and/or inconsolability AND/OR
- Cushing's triad: ↑ BP, ↓ HR, abnormal breathing

Immediate management is essential if cerebral injury is suspected. CT head not required prior to treatment or transport

Immediate Management – High Suspicion of Cerebral Injury

- Move to place of intensive monitoring, call emergency response team if available; RN and MD at bedside
- Assess and support ABCs. The need for intubation is RARE (see Page 1)
- Elevate head of bed to 30°; keep head midline
- Run IV fluids at 75% of rate outlined in Rehydration Table
- Monitor BP and perfusion closely to avoid hypotension and prevent further cerebral injury
- Administer 3% NaCl 5 mL/kg (MAX 250 mL) IV over 10 min OR 20% mannitol 0.5–1 g/kg (MAX 100 g) IV over 15 min
- May repeat hyperosmolar agent dose × 1 after 30 min if no improvement or use alternate agent

Ongoing Monitoring

- Cardiorespiratory monitor, more frequent neurovitals
- Biochemical monitoring as for DKA
- Consider head imaging once stable

Ongoing Fluid Management

- Provide fluid boluses if needed for perfusion, **THEN**
- Adjust IV fluids to 75% or to maintain normal BP, but avoid overhydration
- Fluid choice:
 - IV NS or RL
 - dextrose and K as for DKA ongoing fluid management