

DIABETIC KETOACIDOSIS (DKA) in ADULT PATIENTS (19 years and older) – INITIAL MANAGEMENT

On Admission	Typically, patients will present with ¹ : <ul style="list-style-type: none">arterial pH less than or equal to 7.3anion gap above 12 mmol/Lserum HCO₃⁻ less than or equal to 15 mmol/Lpositive serum and/or urinary ketones, inc β- hydroxybutyrateblood glucose (BG) is usually greater than or equal to 14 mmol/L, but can be lower (e.g. in pregnancy or with use of SGLT2 inhibitors*)		Objectives of management include ¹ : <ul style="list-style-type: none">restoration of normal extracellular fluid volume and tissue perfusionresolution of ketoacidosiscorrection of electrolyte imbalances and hyperglycemiadiagnosis and treatment of coexistent illness		
First 1 to 2 hours	DKA Solution 1		DKA Solution 2		DKA Solution 3
	Fluid Replacement		Glucose and Potassium Replacement		Insulin Infusion
	Bolus and maintenance fluids to correct sodium deficit and water losses. Restoring ECFV improves tissue perfusion and reduces plasma glucose levels both by dilution and by increasing urinary glucose losses.		Serum potassium is often in the normal range at diagnosis, but falls rapidly with treatment, therefore potassium replacement is started immediately. Choose fluid based on CBG Choose rate based on serum K		Metabolic acidosis is a prominent component of DKA; insulin is used to stop ketoacid production as well as reduce blood glucose. Do not start insulin infusion until the serum potassium is 3.5 mmol/L or above
	Severe Deficit : Bolus NS 1 to 2 L to correct shock/ hypotension	Mild to moderate deficit: Maintenance fluids as ordered	CBG 14 mmol/L or above: KCl 40 mmol/L in NS Adjust rate according to serum K (* If CBG below 14 mmol/L, use dextrose-containing IV fluid)		Insulin regular infusion at initial rate of 0.1 unit/kg/hour
After first 1 to 2 hours	Continue maintenance fluids as ordered		Once the CBG is less than 14 mmol/L, change to a dextrose-containing IV solution to maintain CBG between 10 to 14 mmol/L and allow the insulin infusion to continue without hypoglycemia.		insulin infusion is continued until resolution of ketosis, measured by the normalization of the anion gap and improvement of bicarbonate towards normal. As some patients with DKA develop a hyperchloremic non-anion gap metabolic acidosis as part of treatment, the insulin infusion should be continued until both the anion gap has normalized and the bicarbonate is approaching normal. If the AG is increasing or not decreasing with the institution of the insulin infusion, the insulin dose may need to be adjusted.
			CBG less than 14 mmol/L: KCl 40 mmol/L in D5W	CBG less than 14 mmol/L and K greater than 5 mmol/L: D5W	
Monitoring	Serum sodium - physician may change DKA Solution 1 to sodium chloride 0.45% after patient is hemodynamically stable.		CBG by glucometer Q1H serum potassium Q3H Notify MD when: K less than 3.5 or more than 5 mmol/L		CBG by glucometer Q1H anion gap Q3H bicarbonate Q3H Notify MD: anion gap not decreasing anion gap less than 13 mmol/L CBG less than 10 mmol/L
	Vital signs Q1h x 6 hours Consider cardiac monitoring with ECG Use Diabetic Ketoacidosis in Adult Patients - Initial Management Worksheet (Form 1881) to document infusions				

1. Hyperglycemic Emergencies in Adults. Diabetes Canada Clinical Practice Guidelines Expert Committee. Can J Diabetes, 42 (2018) S109-S114