DKA: Treatment for Severely Compromised Patients

Refer to a 24 hr facility for patients presenting with any of the following: weak/laterally recumbent/obtunded, severely dehydrated, uncontrolled DM and systemic illness (PU/PD, weight loss, vomiting, diarrhea, anorexia), hypovolemic/hypotensive, severely acidotic, significant electrolyte abnormalities, hyperosmolar, and/or CNS signs.

DKA: Primary Care Treatment for Less Critical Patients

Consider referral if your clinic's capabilities do not allow for optimal nursing care and hospitalization. Start supportive care if transfer to referral center is not immediately available.

- Administer IV fluids to correct dehydration over 6–12 hr (12–24 hr for patients prone to fluid overload) and meet maintenance fluid requirements. Balanced crystalloids (e.g., lactated Ringer's solution, Plasmalyte, or Normosol R) are ideal.[a,b]
- Monitor BG with a PBGM or CGM. If using CGM, confirm accuracy of initial BG readings via comparison to PBGM results.
- Add potassium chloride (KCl) to fluids, and/or potassium phosphate (KPhos) as needed.[a,b,c]
- Once on fluids and the potassium is >3.0-3.5 mEq/L, it is safe to administer 0.1 U/kg regular (R) insulin IM. Try to initiate insulin within 4-6 hr of presentation.
- Measure BG every 1–2 hr and give 0.1 U/kg R insulin IM until BG is <250 mg/dL.
- Then add dextrose to the fluids to make a 2.5–5% solution and maintain the BG around 200–250 mg/dL while continuing insulin administration.
- Monitor BHB every 8–12 hr until the patient is stable.[d]
- Manage concurrent disease, including infections (e.g., urinary tract infection) and pancreatitis.
- Nursing care! Warmth, food, and love.
- When BG is <250 mg/dL and BHB has improved or resolved, if the patient is not consistently eating or drinking, regular insulin injections can be continued every 1–2 hr IM or transitioned to 0.2–0.4 U/kg SQ (if the dog is rehydrated) every 4–6 hr.
- When BG <250 mg/dL, BHB has improved or resolved, euhydration is achieved, and the dog is eating consistently, transition to SQ intermediate or basal-acting insulin.
- Glycemic regulation before discharge is not a goal of DKA management and should not be expected.

BG, blood glucose; BHB, beta-hydroxybutyrate; CGM, continuous glucose monitor; CNS, central nervous system; DKA, diabetic ketoacidosis; DM, diabetes mellitus; KCl, potassium chloride; KPhos, potassium phosphate; IM, intramuscular; PBGM, portable blood glucose monitor; PD, polydipsia; PU, polyuria; R, regular insulin; SQ, subcutaneous; U, unit

a. Gal A, Odunayo A. Diabetes ketoacidosis and hyperosmolar hyperglycemic syndrome in companion animals. *Vet Clin North Am Small Anim Pract* 2023;53(3):531–50.

b. Panciera D. Fluid therapy in endocrine and metabolic disorders. In: DiBartola S, ed. *Fluid, Electrolyte, and Acid-Base Disorders in Small Animal Practice*. 4th ed. Philadelphia: WB Saunders; 2012:500–13.

c. Boag A. Diabetic ketoacidosis and hyperglycemic hyperosmolar syndrome. In: Mooney CT, Peterson ME, Shiel RE, eds. *BSAVA Manual of Canine and Feline Endocrinology*. 5th ed. Gloucester: British Small Animal Veterinary Association; 2023:243–51.

d. Stojanovic V, Ihle S. Role of beta-hydroxybutyric acid in diabetic ketoacidosis: a review. *Can Vet J* 2011;52(4):426–30.

FIGURE 3.1

Diabetic Ketoacidosis Protocol for Dogs

The *2026 AAHA Diabetes Management Guidelines for Dogs* are available at aaha.org/diabetes-management-dogs

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