

Understanding Diabetic Ketoacidosis (DKA) in Clinical Practice

Early recognition and treatment are critical.

- DKA is a life-threatening complication of diabetes caused by a lack of insulin, leading to hyperglycemia, ketosis, and metabolic acidosis.
- Occurs primarily in type 1 diabetes but can also occur in type 2 under certain stress conditions (infection, trauma, etc.).

Pathophysiology and Diagnostic Criteria

Insulin insufficiency/deficiency +/- triggers
(new-onset type 1 diabetes, insulin omission, infection, myocardial infarction, surgery, substance use)

- **Diabetes/hyperglycemia:** Glucose ≥ 200 mg/dL (11.1 mmol/L) OR prior history of diabetes
- **Ketosis:** β -Hydroxybutyrate concentration ≥ 3.0 mmol/L OR urine ketone strip 2+ or greater
- **Metabolic acidosis:** pH < 7.3 and/or bicarbonate concentration < 18 mmol/L



Symptoms



Polyuria



Polydipsia



Weight loss



Fatigue



Kussmaul breathing



Vomiting



Abdominal pain



Altered mental status

Management Goals

GOALS

- Restore circulatory volume and tissue/organ perfusion
- Resolve ketoacidosis
- Correct electrolyte imbalances, particularly potassium.

TREATMENT PROTOCOL

Fluid Replacement:

- 0.9% NaCl or other crystalloid for severe hypovolemia at 1L/hour or at a clinically appropriate rate aiming to replace 50% of the estimated fluid deficit in the first 8–12 hours.
- Add dextrose to the fluids once blood glucose is < 250 mg/dL.

Insulin Therapy:

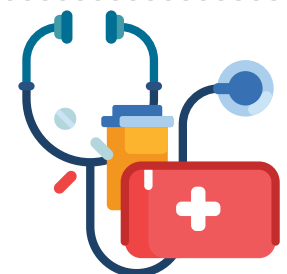
- IV regular insulin: 0.1 units/kg IV bolus, then start a continuous IV infusion 0.1 units/kg per hour.
- Continue the drip until plasma ketone < 0.6 mmol/L and venous pH ≥ 7.3 or bicarbonate ≥ 18 mmol/L and patient is able to tolerate food.
- Transition to subcutaneous insulin 1–2 hours before stopping IV insulin to prevent rebound hyperglycemia.

Electrolyte Management:

- Monitor and replace potassium—patients with DKA have a large total body K⁺ deficit. Potassium should be given as long as it is less than 5.0 mmol/L.
- Potassium monitoring and replacement critical, as insulin therapy drives potassium into cells.

Bicarbonate Therapy:

- Generally not recommended unless pH < 7.0 .



This infographic is based on recommendations from the ADA's Standards of Care in Diabetes—2024

Prevention and Education

When seeing people with diabetes:



Educate on daily glucose monitoring, ketone monitoring, sick-day management, maintaining hydration, and adjusting insulin doses.



Emphasize the importance of early medical intervention. If symptoms of DKA appear, recommend immediate follow up with healthcare professional