



## Overview About What We Need to Know About DKA, Pathology, Symptoms and Treatment

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The most serious complication of type 1 diabetes is diabetic ketoacidosis (DKA), though it can occur in patients with type 2 but less common. Basic pathology in DKA is hypo insulinism or lack of effective insulin action followed pathologic cascade of events in 3 pathways include;

- Excessive blood glucose (hyperglycemia more than 200 mg/dl) produced osmotic diuresis and loss of fluid and electrolytes from urine. It cause dehydration with different severity.
- Lipidolysis resulted increased metabolism of free fatty acids and production of ketone bodies like acetone. Therefore patients may refer with annoyed smell of ketone like as “nail polish remover”.
- Both above events cause decrease blood PH (acidosis).therefore patients with DKA will present rapid and deep breathes.

### What are symptoms of DKA?

According to simple description of physiopathology, you can guess some symptoms of the patients with DKA.

- Increment plasma glucose more than 200 mg/dl
- Dehydration and extreme thirst due to frequent urination and plasma hyper osmosis.
- Rapid and deep breathing; in fact, it's a compensatory mechanism for decreasing of acidosis.
- Abdominal pain with nausea and vomiting due to different reasons like as blood ketones accumulation and intestinal paralysis.
- Fatigue and lethargy may appear for dehydration
- Decrement of consciousness level even comatose due to brain edema. cerebral edema is unpredictable occurs more frequently in younger children.

Sign and symptoms of diabetic ketoacidosis			
Sign		Symptoms	
Dehydration	Kussmaul breathing	Polyuria/polydypsia	Weight loss and fatigue
Smell of ketone	Lethargy	Nocturia	Headache
Abdominal tenderness	Mental status changes	Abdominal pain	Confusion

**Table 1**

Appearance of any symptoms depend on how much patient is delayed to hospital.

### What parents must do at home

DKA is an emergency. If left untreated, it can lead to coma and even death. Therefore if your patient has above symptoms, immediately call emergency service. Before coming of emergency, firstly

keep your calmness and hold head your patient up. You must not inject insulin your patient at all. Insulin injection in this situation may exacerbate brain edema. using of oxygen maker in home before hospital admission is beneficial if your patient has respiratory distress. It is preferred keep your patient fast, because decrement in consciousness level, increase risk of aspiration.

### What we must do in hospital

Initial investigation is airway, breathing and circulation assessment. Though decrement of insulin is basis of DKA, first medical therapy in hospital is fluid and electrolyte replacement with normal saline that help to fade out acidosis and hyperglycemia. Then after first hour, insulin therapy will be start. Treatment with bicarbonate must be avoided as much as possible. Electrolyte and blood gas will be monitored and will be corrected by hydration and insulin. If Whenever treatment result to eliminate symptoms, fluid and food eating will be resume.

### What we should do for DKA prevention

If your children is known case of diabetes mellitus, there is always concern about DKA appearance. Therefore it is very important, insulin injection must do with every meal time and it is necessary blood glucose assay before and 2 hour after meal time. Sometimes blood glucose checking should be done frequently like as infectious periods. If blood glucose levels are frequently more than normal target range according to every age, may need to increment insulin dosage, if you know it or after your medicine consultation.

Also if there is strips for checking of urine ketones, it can inform you about DKA.

It is important we should know, in primary steps, may patient do not have any symptoms of DKA. Because of this, frequent blood glucose checking and urine ketones strips can help recognize DKA in preliminary.

we advise parents, learn how use urine ketone strips and whenever urine ketone showed positive bands feel danger for children with T1DM.

When your children with T1DM, involved by unexplained nausea and vomiting with or without abdominal pain, inappropriate lethargy, headache, breath difficulty call your physician or refer to hospital immediately even blood glucose not be high.

Unfortunately, almost 25% children with T1DM, firstly present with DKA, while her or his parents have not any information about DKA and may cause delay in take treatment on time and result morbidity and even mortality.

Therefore education about symptoms of DKA may help to save life a children.

For additional information about DKA you can refer to BSPED Interim Guideline for the Management of Children and Young People under the age of 18 years with Diabetic Ketoacidosis and care. [diabetesjournals.org](http://diabetesjournals.org).

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