Diabetic ketoacidosis (DKA) is a severe and life threatening metabolic disease. It occurs when the body cannot use glucose as an energy source because there is no insulin or a shortage of insulin. The body switches to burning fatty acids and producing acidic ketones in the blood and urine. Ketones are poisonous in high levels. This condition is called ketoacidosis.
What are ketone bodies?

The breakdown of fatty acids in the liver produces three compounds: β-hydroxybutyric acid (β-HB), acetoacetate, and acetone, known collectively as ketone bodies. β-HB comprises approximately 78%, and acetoacetate is approximately 20% of the ketone bodies. Acetoacetate is unstable and breaks down into carbon dioxide and acetone, which comprises the remaining 2%.
Normally, ketones can be broken down into CO₂ and H₂O by the body.

The increase of ketones causes acid/base imbalance, which leads to Ketoacidosis.

If not diagnosed or treated in time, ketoacidosis is potentially fatal.

Why monitor the ketone levels?

- Normally, ketones can be broken down into CO₂ and H₂O by the body.
- The increase of ketones causes acid/base imbalance, which leads to Ketoacidosis.
- If not diagnosed or treated in time, ketoacidosis is potentially fatal.
4 How to test ketone bodies?

Test ketones in urine using “dip stick” technology
Many hospitals still use the nitroprusside urine method to produce a qualitative assessment of ketoacidosis by detecting both acetoacetate and acetone. This method may not be reliable and may require confirmation by a reference lab.

Test ketone in serum using reagent on chemistry analyzer
Blood ketone testing method that quantify, β-hydroxybutyric acid, the predominant ketone body, is preferred over urine ketone testing for diagnosing and monitoring ketoacidosis. This method had been
Why is the β-Hydroxybutyrate test important?

β-Hydroxybutyrate test is significant because:

• The nitroprusside urine method detects less than 25% of the ketones present in ketosis. β-Hydroxybutyrate test detect the major ketone (β-HB) produced by body (78%)
• During ketoacidosis, β-Hydroxybutyrate levels increase immediately and increase more than levels of acetone and acetoacetate, providing an earlier indication of metabolic trends.
• Ketoacidosis.
Quantitative and objective β-Hydroxybutyrate results provide a better method for
Who are recommended to test ketones?

Recommended that under the following conditions, diabetics should be tested for the presence of ketones:

- **Patients with insulin dependent diabetes**
  (blood glucose levels are consistently over 240 mg/dL)

- **Pregnant women with gestational diabetes**

- **When symptoms of ketoacidosis** nausea, vomiting, abdominal pain are present

- **During acute illness and stress**

Other conditions where ketone testing has clinical value:

- Ketosis due to starvation and malnutrition;
- Ketoacidosis due to alcoholism;
- Monitoring hypoglycemia;
- Monitoring ketogenic diets used to control seizures in