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Lactic Acidosis

Ketoacidosis

Renal Tubular  
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Uremia

## Ketoacidosis

Ketoacidosis is a common form of elevated anion gap metabolic acidosis seen in patients with insulin requiring diabetes mellitus, alcoholics and pts undergoing fasting or starvation and is due to the overproduction of ketone bodies (Ketosis) leading to accumulation of ketones in plasma (Ketonemia) and urine (Ketonuria).

The basic mechanism for the development of Ketonemia is as the following. In starvation states where plasma glucose levels are low or in states of low plasma insulin where uptake of glucose by cells is diminished, fatty acids will be mobilized and transported to tissues (brain, skeletal muscle, heart) for fatty acid oxidation and energy production. Fatty acids are also transported to the liver, where due to diminished citric cycle activity resulting from gluconeogenesis, acetyl CoA from fatty acid oxidation can not be oxidized and is instead converted to the generation of ketone bodies. These ketone bodies (acetoacetate and  $\beta$ -hydroxybutyrate) serve as a source of fuel for other tissues, in particular, the brain. Ketonemia arises when this process is prolonged due to prolonged states of glucose unavailability, as the hepatic production of ketone bodies overwhelms the capacity of extrahepatic tissues to oxidize them. Accumulation and ionization of ketones in plasma result in the release of excess hydrogen ions which then lead to acidosis.

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