

## THE DIABETIC KETOACIDOTIC (DKA) PATIENT

Diabetic patients that are not well regulated are at risk for entering a ketoacidotic state. The DKA state occurs when the body metabolizes alternate energy sources (i.e. fats instead of carbohydrates). The breakdown of which results in the accumulation of ketone bodies in the blood. These ketone bodies are acidic and lower the normally neutral pH of the blood. Multiple organ systems are adversely affected by a low blood pH, especially the nervous, cardiovascular and renal (kidney) systems. The severity of organ system damage is directly related to how acidotic the patient becomes. Thus, early identification and early, aggressive treatment is necessary for a good outcome.

Both dogs and cats can be affected. Most commonly DKA occurs when a diabetic patient goes undiagnosed; however, previously diagnosed diabetics that develop concurrent disease are at risk. We generally think of diabetics as being in a relatively fragile state of balance/compensation. If another disease/problem develops, this balance can be thrown off, leading to decompensation that is often severe. The most common concurrent diseases resulting in DKA are pancreatitis, skin or urinary tract infections, congestive heart failure, Cushing's disease and gastroenteritis.

DKA animals usually display lethargy and weakness that can be extreme; mental dullness to a moribund state; anorexia; vomiting; rapid breathing. Upon presentation to a veterinary hospital, the diagnosis is made by documentation of a low blood pH and ketones in the urine. Initiation of aggressive treatment after diagnosis is often necessary. The mainstay of therapy is typically supportive and symptomatic: intravenous fluids; electrolyte and dextrose supplementation; frequent administration of a short-acting insulin; medications for nausea and vomiting. The blood glucose must be closely monitored every 2-4 hours and the insulin dose is typically adjusted frequently, as these patients tend to be very erratic. Overall, we generally try to get the best control over their diabetes that we can by trial and error. Until the underlying/concurrent disease is diagnosed and treated, tight control is unlikely.

The typical hospital stay for a DKA patient is 3-7 days. If an underlying disease can be identified with specific treatment initiated and the patient eats and drinks well, they are slowly weaned off of therapy as above and started back on their previous insulin regimen. The dose of insulin is usually not what it was before the DKA event. Essentially, we have to start all over again, using conservative doses at first and then gradually making increases, in small increments, as needed. After the patient is sent home, relatively frequent visits to the hospital will be necessary for the first two to three months.

If an underlying disease can not be identified, the prognosis becomes poorer. We continue to control the patient the best we can, but recurrence of a DKA event is very possible. Owners must carefully monitor their pet.

It is important for owners to realize that a DKA patient can be very frustrating to manage for the owner and the veterinarian alike. A strong dedication is imperative. Long-term presumptions can usually not be made, as these patients are very dynamic, and we just deal with changes as they come up.