Study Design

- 116 diabetic dogs
  o 18 insulin-treated with a positive urine ketone test
  o 88 untreated, newly diabetic
- Dogs were assigned to 1 of 3 groups on the basis of laboratory findings
  o Diabetic ketoacidosis (DKA; n=43)
    ▪ Hyperglycemia (serum glucose > 250 mg/dL) and glycosuria
    ▪ Acidosis (plasma bicarbonate [HCO₃⁻] = 15 mmol/L) or acidemia (pH < 7.3)
    ▪ Positive urine ketones
  o Diabetic ketosis (DK; n = 41)
    ▪ Hyperglycemia and glycosuria
    ▪ Lack of acidosis or academia
    ▪ Positive urine ketones
  o Nonketotic diabetes (NKD; n = 32)
    ▪ Hyperglycemia and glycosuria
    ▪ Lack of acidosis or academia
    ▪ Negative urine ketones
- Fifty healthy dogs were selected for the reference range study
  o All had serum glucose values within the reference range (80–120 mg/dL) and negative urine glucose and ketones

Results and Discussion
• Serum B-OHB concentrations differed significantly (P < .001) among the study groups
• All dogs from the DKA and DK groups and 21 dogs from the NKD group had serum B-OHB concentrations above the upper limit of the reference values stated for this study (0.15 mmol/L)
• Serum B-OHB concentrations were higher in dogs from the NKD group in relation to healthy dogs (P<.001)
• The overall accuracy of the test was high (0.92)
  o This means that a randomly selected individual from the DKA group will have a serum B-OHB value greater than that of a randomly chosen animal from the DK group 92% of the time
• The cutoff value of 1.9 mmol/L showed the best sensitivity (100%, with specificity = 45%)
• The cutoff value of 3.8 mmol/L presented high specificity (95%, sensitivity = 72%) and a greater than 14 positive likelihood ratio

Key Points
• “... findings suggest that B-OHB determination may be a potential tool for diagnosing and monitoring ketoacidosis in diabetic dogs and therefore merits further study in the clinical setting”
• Considerable overlap between the DKA and DK groups may limit its use as a single laboratory index for the diagnosis of DKA with a simple cutoff value