

Pancreatic Disorders

Diabetes Mellitus in Dogs



The foundation of treatment for diabetic dogs is insulin along with dietary modifications. Most diabetic dogs have an absolute insulin deficiency resulting from destruction of pancreatic beta cells, which is similar to human type 1 diabetes. While these dogs will need exogenous insulin for life, nutrition is still important to diabetes management.

Insulin resistance caused by obesity, advancing age, certain health conditions (e.g., hyperadrenocorticism, hypothyroidism, hypertriglyceridemia, and pancreatitis), and genetics are associated with increased risk for, or challenges in managing, diabetes mellitus in dogs.^{1,2} Neutered males and intact females are also at greater risk of developing diabetes compared to intact male dogs.

The classic clinical signs of canine diabetes mellitus are polyuria, polydipsia, polyphagia, and weight loss. Onset of signs is typically subtle, occurring over weeks to months, and may initially go unnoticed by the dog owner.

The goals of dietary management are to:

- help regulate glycemic control to manage clinical signs of diabetes while avoiding hypoglycemia
- achieve and/or maintain healthy body condition and muscle mass

Key Messages

- In newly diagnosed dogs, the first goal of diabetes management is to reduce and control hyperglycemia through insulin administration and diet.
 - An important complication associated with insulin therapy is hypoglycemia, or excessively low blood glucose concentration. In dogs, it is defined as blood glucose < 60 mg/dL (< 3.3 mmol/L).⁴
 - Signs of hypoglycemia may occur suddenly and can include:
 - weakness
 - extreme lethargy
 - muscle twitching
 - trembling
 - incoordination
 - unusual behavior
 - seizures

- collapse
- coma
- Nutritional management of diabetic dogs is different from diabetic cats because the underlying disease etiologies are different.
 - The starch, or digestible carbohydrate, content of complete dog foods is the main determining factor of postprandial glucose and insulin responses in healthy dogs.^{5–7}
 - The amount and source of dietary starch can alter postprandial glucose in diabetic dogs.^{8,9}
 - Increased soluble and insoluble fiber can reduce postprandial hyperglycemia and reduce caloric content.^{1,10}
- Diet recommendations depend on individual factors such as body condition score, body weight, food acceptance, exercise, and treats. A diet that will correct obesity (if indicated), optimize body condition, and minimize postprandial hyperglycemia is recommended.
 - Dogs with uncomplicated diabetes can do well with a palatable, nutritionally balanced diet that contains a moderate dietary fiber content. The key is to assure consistent intake so that insulin can be coordinated with nutrient absorption.¹
 - Underweight diabetic dogs can benefit from a higher calorie diet containing moderate amounts of both soluble and insoluble fiber.
 - Dietary fat restriction (< 30% of metabolizable energy [ME]) is recommended for diabetic dogs with concurrent chronic pancreatitis or persistent hypertriglyceridemia, except for diabetic dogs in thin body condition.¹¹
- Once glycemic control is established, managed weight loss in obese dogs can help improve sensitivity to insulin.
 - The target rate of weight loss is 1% to 2% of body weight per week.¹
 - For overweight and obese diabetic dogs needing to lose weight, therapeutic diets for weight management reduce the risk of nutritional deficiencies because they are formulated to be complete and balanced at low caloric intake.¹²
 - Weight loss in obese patients may reduce the amount of insulin needed to maintain healthy blood glucose levels.
- Meals of equal size should be fed twice daily at the time of insulin administration.
- Checking for clinical signs is important to effective diabetes monitoring.
 - At home, dog owners can monitor water intake, urine output, appetite, and body condition.
 - Veterinary healthcare teams will want to monitor muscle mass, body weight, and body condition regularly in all diabetic patients.
 - Rapid and/or unplanned weight loss is an indication of poorly controlled diabetes.
- Adjust dietary recommendations, as needed, when concurrent diseases are present (e.g., pancreatitis, renal disease, or intestinal disease).

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