Vetsulin® CurveKit™

Glucose curve workpad ➤ How-to instructions ➤ Interpretation guidelines

UNPARALLELED SUPPORT FOR MANAGING CANINE AND FELINE DIABETES—ONLY FROM MERCK ANIMAL HEALTH
Once the patient has been on Vetsulin® (porcine insulin zinc suspension) for 5 to 7 days for dogs, or 7 to 14 days for cats, admit the patient either:

1. First thing in the morning before eating and receiving Vetsulin, or
2. Right after the patient eats and receives Vetsulin at home.

After admitting the patient, it’s important that the patient follow the same routine as it does at home. Provide the same food and exercise on the same schedule it is accustomed to.

**BLOOD SAMPLING:**
Measure blood glucose every 2 hours. Ideally, continue for 12 hours if insulin is administered twice daily (BID) or for 24 hours for canine once-daily (SID) insulin administration.

**CHART:**
Plot the blood glucose concentrations against time to create the blood glucose curve. Ideally, the nadir, or lowest blood glucose level after administering insulin, should be 100–125 mg/dL in dogs and 120–200 mg/dL in cats. Once you have established the nadir, then determine the duration of activity. This is the time between insulin injection and when blood glucose becomes >200–250 mg/dL for dogs or >250 mg/dL for cats after the nadir. For dogs starting with once-daily dosing, if the blood glucose is above 250 mg/dL by 12 hours after injection, then the dog will need twice-daily insulin injections.

At the end of the testing period, compare the curve to the interpretation charts on the next page to aid in developing your treatment plan.

**NOTE:**
A 24-hour curve may be the only way to accurately diagnose Somogyi overswing. Sampling can be done at the marginal vein of the ear, or for dogs, on the mouth mucosa (just flip up the lip) to minimize stress.
Interpreting serial glucose curves.

Serial glucose curves are a useful tool in the initial stabilization and monitoring of the diabetic dog and cat, giving the most accurate assessment on which to base changes in insulin therapy. They are vital in investigating the unstable diabetic.

These charts show the curves you would expect to find in the stable diabetic dog and cat as well as the 4 main problem scenarios. The charts for the 4 problem scenarios are plotted against a 24-hour timeline but can be easily adapted to a 12-hour BID dosing timeline.

**Ideal Blood Glucose Curve: SID Dosing**
(Insulin given at time=0)

- The renal threshold in the dog is 180–220 mg/dL and in the cat is 200–280 mg/dL.
- A stable diabetic dog maintains a blood glucose range of 100–250 mg/dL for most of a 24-hour period, while a stable diabetic cat maintains a blood glucose range of 120–300 mg/dL.

**Insufficient Insulin Dose**
(Insulin administered at time=0)

**Action:** In general, increase insulin dose in dogs. Note that insufficient insulin dose can be difficult to determine in diabetic cats due to stress-induced hyperglycemia, but if the cat’s clinical signs have not resolved, the nadir is >200 mg/dL, and Somogyi overswing has been ruled out, increase the dose in 1 IU increments.

**Rapid Metabolism of Insulin**
(Insulin administered at time=0)

**Action:** Decrease SID dose by 25% and administer insulin twice daily or change to longer-acting preparation.

**Insulin Resistance**
(Insulin administered at time=0)

**Action:** Investigate cause, e.g., Cushing’s disease, hyperprogesteronism, antibody production, owner issues, injection issues, or use of the wrong type of syringe (see Diagnostic Tests to Consider for the Evaluation of Insulin Resistance in Diabetic Dogs and Cats on center pocket of this folder). Consideration should be given to Somogyi overswing, which can present as persistent hyperglycemia for a few days following the hypoglycemic event.

**Insulin-induced Hyperglycemia or Somogyi Effect**
(Insulin administered at time=0)

**Action:** For dogs, decrease dose by 50% or more. You may need to go back to the starting dose if the current dose is higher than 2.2 IU/kg. For cats, decrease dose by 50% or return to starting dose of 1 IU/BID, whichever is lower.

BID = twice daily; SID = once daily.
Causes of insulin resistance.

Some causes of insulin resistance are obvious and can be detected immediately. However, identification of many other causes of insulin resistance may require an extensive round of diagnostic tests (see below). Several concurrent disorders can affect insulin status in dogs and cats and interfere with the effectiveness of insulin therapy.

**DIAGNOSTIC TESTS TO CONSIDER FOR THE EVALUATION OF INSULIN RESISTANCE IN DIABETIC DOGS AND CATS**

- CBC, serum biochemistry panel, urinalysis
- Bacterial culture of the urine
- Serum lipase and amylase (pancreatitis)
- Serum trypsin-like immunoreactivity (exocrine pancreatic insufficiency, pancreatitis)
- Adrenocortical function tests
  - ACTH stimulation test (hyperadrenocorticism)
  - Low-dose dexamethasone suppression test (hyperadrenocorticism)
- Thyroid function tests
  - Baseline serum total and free T<sub>4</sub> (hypothyroidism or hyperthyroidism)
  - Endogenous TSH (hypothyroidism)
  - TSH stimulation test (hypothyroidism)
  - TRH stimulation test (hypothyroidism or hyperthyroidism)
  - T<sub>3</sub> suppression test (hyperthyroidism)
- Serum progesterone concentration (diestrus in intact female dog)
- Plasma growth hormone or serum insulin-like growth factor I concentration (acromegaly)
- Serum insulin concentration 24 hours after discontinuation of insulin therapy (insulin antibodies)
- Serum triglyceride concentration (hyperlipidemia)
- Abdominal ultrasonography (adrenomegaly, adrenal mass, pancreatitis, pancreatic mass)
- Thoracic radiography (cardiomegaly, neoplasia)
- MRI (pituitary mass)

**References:**

**QUESTIONS? WE’RE HERE FOR YOU.**

For support and answers from Merck Animal Health diabetes professionals, call 877-783-4840. Or visit us online at www.vetsulin.com.