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## CLINICAL BRIEF

# A PROTOCOL FOR DIABETIC MANAGEMENT

A Supplement to *Veterinary Team Brief*

### STEP 1: The Crux of the Matter

#### THE FACTS OF THE MATTER

- Individual insulin needs are not predictable and are likely to vary over time.
- Most patients need periodic changes in insulin dose; appropriate monitoring is key to promptly identifying the need for a change.
- Although indirect assessments of glycemic control, such as fructosamine concentrations, can be helpful, regular measurement of BG throughout a typical day is the preferred way to assess and adjust insulin therapy.
- BG values collected at home are a more accurate reflection of glycemic control than readings obtained in the clinic, as the stress of a hospital visit is avoided and normal routines and activities are preserved.

#### REFERENCES

1. **Feline diabetes mellitus in the UK: The prevalence within an insured cat population and a questionnaire-based putative risk factor analysis.** McCann TM, Simpson KE, Shaw DJ, et al. *J Feline Med Surg* 9:289-299, 2007.
2. **Canine diabetes mellitus; can old dogs teach us new tricks?** Catchpole B, Ristic JM, Fleeman LM, Davison LJ. *Diabetologia* 48:1948-1956, 2005.
3. **Evaluation of a quality-of-life tool for dogs with diabetes mellitus.** Niessen SJM, Powney S, Guitian J, et al. *J Vet Intern Med* 26:953-961, 2012.
4. **Evaluation of a quality-of-life tool for cats with diabetes mellitus.** Niessen SJM, Powney S, Guitian J, et al. *J Vet Intern Med* 24:1098-1105, 2010.



**FOR DIABETIC PATIENT  
MANAGEMENT  
GUIDELINES VISIT**

**Veterinaryteambrief.com/  
diabeticmanagement**

## Diabetes & Its Management

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Diabetes mellitus is a common endocrine disorder, estimated to affect one in 308 dogs and one in 230 cats.<sup>1,2</sup> Management strategies are constantly evolving, influenced in part by changing insulin availability, advances in blood glucose (BG) monitoring devices, and the expectations of owners. However, with an organized team-based approach and a sound understanding of this disease, practitioners can care effectively for these patients and help them live without troublesome clinical signs.

#### STARTING DOWN THE ROAD TO SUCCESS

- Successful management starts with a careful investigation of the client's goals and concerns.
- It is important to ensure that the client understands the relationship between insulin and BG.
- The veterinary team must work to engage the clients in the management process and help them feel part of the treatment team.

BG monitoring at home is one of the most effective ways to achieve the latter two goals. Clients who partner with their veterinary team in this way are less anxious because they have a clearer understanding of diabetes. They can work with their veterinarians to troubleshoot problems and intervene appropriately. Recent studies assessing quality of life perceptions for owners of diabetic pets have highlighted some common fears:

hurting their pet; making a bad decision; and not recognizing hypoglycemia.<sup>3,4</sup>

#### RESETTING EXPECTATIONS

Initial expectations may be unrealistic and need to be redefined. For example, most diabetic dogs have some degree of polyuria and it may not be appropriate for a client to leave his or her dog alone for 10 hours. A preemptive discussion about installing a doggy door may make an enormous difference to this client's perception of success. Conversely, some clients have negative prior experiences with diabetes, either with a previous pet or family member. Many worries are unfounded and can be alleviated through an up-front, thorough discussion that clears the way for the client to start treatment with a positive outlook.

## STEP 2: Understanding the Challenge

# Keys to Successful Management of the Diabetic Patient

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Effective diabetic management is a 3-legged stool—each part is equally important, all are interdependent, and no part can stand alone. These “legs” are client perception, patient status, and assessment of glycemic control. Weaving these components together creates a successful outcome, defined as a stable diabetic patient and satisfied client.



When making treatment decisions, client perception and patient status should be weighed equally with BG data.

- Clients should be encouraged to perform serial BG measurements at home every 4 to 6 weeks, or anytime they see a change in their pet, and share those results with their veterinarian.
- Clearly define action points with clients—such as what to do with the data, when to call the veterinarian, and when to decrease the insulin dose—ahead of time.
- If clients are reluctant to measure BG at home, encourage them to watch the process on the Internet. There are dozens of videos (see examples at [veterinaryteambrief.com/diabeticmanagement](http://veterinaryteambrief.com/diabeticmanagement)) showing various ways to do this, and seeing others succeed is reassuring.
- Schedule routine appointments quarterly to examine the patient, review the data, and make sure that the client is satisfied with how things are going. This visit is a great time to check for urinary tract infections or measure fructosamine levels.

Bear in mind that BG data is simply a tool for guiding insulin therapy; the goal is not to achieve the perfect curve. Short periods of hyperglycemia are generally well tolerated and cause minimal morbidity in patients. When making treatment decisions, client perception and patient status should be weighed equally with BG data. *The only exception is documented hypoglycemia. A dose reduction is essential if this occurs.*



**TO WATCH THE  
STEP-BY-STEP PROCESS  
OF BLOOD GLUCOSE  
TESTING AT HOME VISIT**

**[Veterinaryteambrief.com/  
diabeticmanagement](http://Veterinaryteambrief.com/diabeticmanagement)**

CLIENT PERCEPTION	PATIENT STATUS	ASSESSMENT OF GLYCEMIC CONTROL
<ul style="list-style-type: none"><li>• How is the patient doing overall?</li><li>• Is he or she drinking excessively?</li><li>• Does he or she get up in the night to urinate?</li><li>• Have there been any urinary accidents?</li><li>• Is the litter box flooded with urine?</li><li>• Is he or she sleeping more than usual?</li><li>• Does he or she seem confused or disoriented?</li></ul>	<ul style="list-style-type: none"><li>• Assess body condition score.</li><li>• Document weight loss or gain.</li><li>• Evaluate overall muscle mass.</li><li>• Check for signs of peripheral neuropathy (cats).</li><li>• Evaluate mouth, gums, teeth.</li><li>• Examine eyes, including retinas.</li></ul>	<ul style="list-style-type: none"><li>• BG data are essential for appropriate adjustment of insulin therapy.</li><li>• Insulin dose should not be increased without determination of nadir BG.</li><li>• On-target fructosamine levels indicate adequate control in stable patients:<ul style="list-style-type: none"><li>– Cannot be used to adjust insulin therapy</li><li>– Cannot guide treatment decisions in poorly regulated patients.</li></ul></li></ul>

## STEP 3: Client & Practice Matters

# Practice Management Concerns

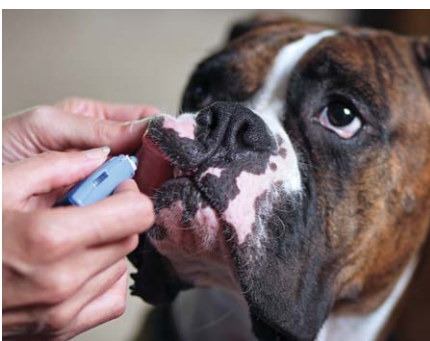
Jessica Goodman Lee, CVPM

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Conducting at-home glucose curves is recommended for the pet because it provides an accurate picture of glycemic history during a “normal” day—one without the stress of being hospitalized. But there are also financial benefits and convenience factors for both the client and the practice (see sidebar on page 8) of monitoring blood glucose in pets at home.

### THE WELL-KNIT STAFF

While it may be relatively easy for clients to understand the medical benefits of at-home testing (AHT), many are understandably uncomfortable about obtaining blood samples from their pets. It is the job of the entire practice team to assuage their fears and provide training and encouragement. Once clients see how easy it is to obtain a sample and use the glucose meter, they may be grateful. The key is to tailor the training to each client based on his or her comfort level.



It is the job of the entire practice team to assuage client fears and provide training and encouragement.

PRACTICE MANAGER	VETERINARIAN	TECHNICIAN	RECEPTIONIST
<p>Ensure that everyone is on the same page about the program’s purpose and protocols.</p> <ul style="list-style-type: none"> <li>Schedule educational meetings about diabetes and the practice’s recommended protocols. Convey the:               <ul style="list-style-type: none"> <li>Medical benefits of AHT</li> <li>Importance of using a monitor calibrated for cats and dogs</li> </ul> </li> <li>Assemble and share a standard packet of materials/instructions for clients who are starting AHT.</li> <li>With the veterinarians, establish treatment codes and charges for:               <ul style="list-style-type: none"> <li>A client <i>Starter Package</i> (AlphaTRAK® Blood Glucose Monitoring System, strips, lancets, lancing device, training sessions with a technician)</li> <li>Lancet and strip refills</li> <li>A prepaid curve analysis package (interpretation of testing results, email and/or phone consultation)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Draft written standards of care for diabetes that include AHT</li> <li>Make sure that all technicians are adept at obtaining blood samples with a lancet and can train clients.</li> <li>Educate the client about:               <ul style="list-style-type: none"> <li>Benefits of AHT</li> <li>Frequency of testing</li> <li>Clinical signs to monitor</li> <li>Administration of insulin</li> </ul> </li> <li>Discuss the prepaid consultation package and provide a BGC schedule for the next few months.               <ul style="list-style-type: none"> <li>Document the client’s preferred method of communication and provide your individual email address.</li> <li>Indicate a follow-up in the chart if the curve results have not been received by the first scheduled date.</li> </ul> </li> <li>Introduce the clients to the technician who will conduct the needed training.</li> <li>Commend the special efforts of clients who decide to regulate their pet’s diabetes at home.</li> </ul>	<p>Train clients to use a lancet and testing strips and how to monitor.</p> <ul style="list-style-type: none"> <li>Point out the areas from which a sample can be obtained and determine which is suitable for the patient and client.</li> <li>Demonstrate how to use the lancet; then have the client try until he or she is comfortable.</li> <li>Review the veterinarian’s instructions and ensure that all the client’s questions have been answered.</li> </ul> <p>If a client is still nervous or unsure about obtaining blood or using the monitor, schedule another brief training session for the following day. Continue to do so until he or she is comfortable and confident with the process.</p>	<p>Communicate support for the client’s decision to do AHT. Convey that the entire veterinary team has undergone recent training about diabetes and everyone is committed to help clients provide the prescribed medical management for their pets. (See the Client Handout on page 7.)</p> <p>Reassure worried clients about at-home testing and emphasize that it will become routine.</p> <ul style="list-style-type: none"> <li>Reiterate that clients should call the practice with questions or concerns or to request more training.</li> <li>Recommend that clients call to order lancets and testing strips a few days before they run out.</li> </ul>

## STEP 3: Client & Practice Matters

# Blood Glucose Curves: The Whys & Hows

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If the BGC does not contain enough data to reliably determine the nadir, average, or duration, the results should be interpreted with caution.



**FOR MORE DETAILS  
ABOUT DIABETES AND  
MANAGING DIABETIC  
PATIENTS VISIT**

**Veterinaryteambrief.com/  
diabeticmanagement**

### WHEN TO CONDUCT A BGC

- Every 4 to 6 weeks, as part of a routine monitoring program
- After increase or decrease in insulin dose
  - Ideal to perform curve within 3 days of a change in dose
- Evidence of hypoglycemia
  - Weakness, disorientation, fatigue, tremors
- Increase in thirst or urination
  - Frequent nocturia, accidents in the house
- Anytime that insulin sensitivity is expected to change
  - Starting thyroid supplementation
  - Starting methimazole
  - Treating a urinary tract infection
  - Starting trilostane for hyperadrenocorticism
  - Administering glucocorticoids for any reason

The information gathered from a blood glucose curve (BGC) guides decisions regarding insulin type and dose, particularly if a patient is not doing well. Remember to consider information from the client and the patient's overall status when contemplating a change in insulin therapy. The exception is hypoglycemia; the insulin dose must be decreased by 25% if this is documented.

To assess the response to insulin, we need to know the following:

- Nadir BG (target for a diabetic recheck is 100-150 mg/dL)
- Average BG (target is <250 mg/dL)
- Duration of effect (target is 10-12 hr with q12h dosing, 20-24 hr with q24h dosing)

To gather sufficient data points for a BGC in most patients, a measurement every 2 hours is required. Measure within 60 minutes if the BG drops quickly (>200 mg/dL over the previous 2 hours) or if it gets close to 100 mg/dL. Less frequent measurements (every 4 hours) may be adequate for feline patients receiving insulin glargine, as BG levels often fluctuate minimally during a 24-hour period. If the BGC does not contain enough data to reliably determine the nadir, average, or duration, the results should be interpreted with caution.

The nadir is often the most critical piece of information. In a stable patient, a nadir of 80 mg/dL may be tolerated; otherwise always decrease the insulin dose by 25% if the nadir goes below 100 mg/dL. It is always inappropriate to increase the insulin dose without first establishing a reliable nadir with a BGC.



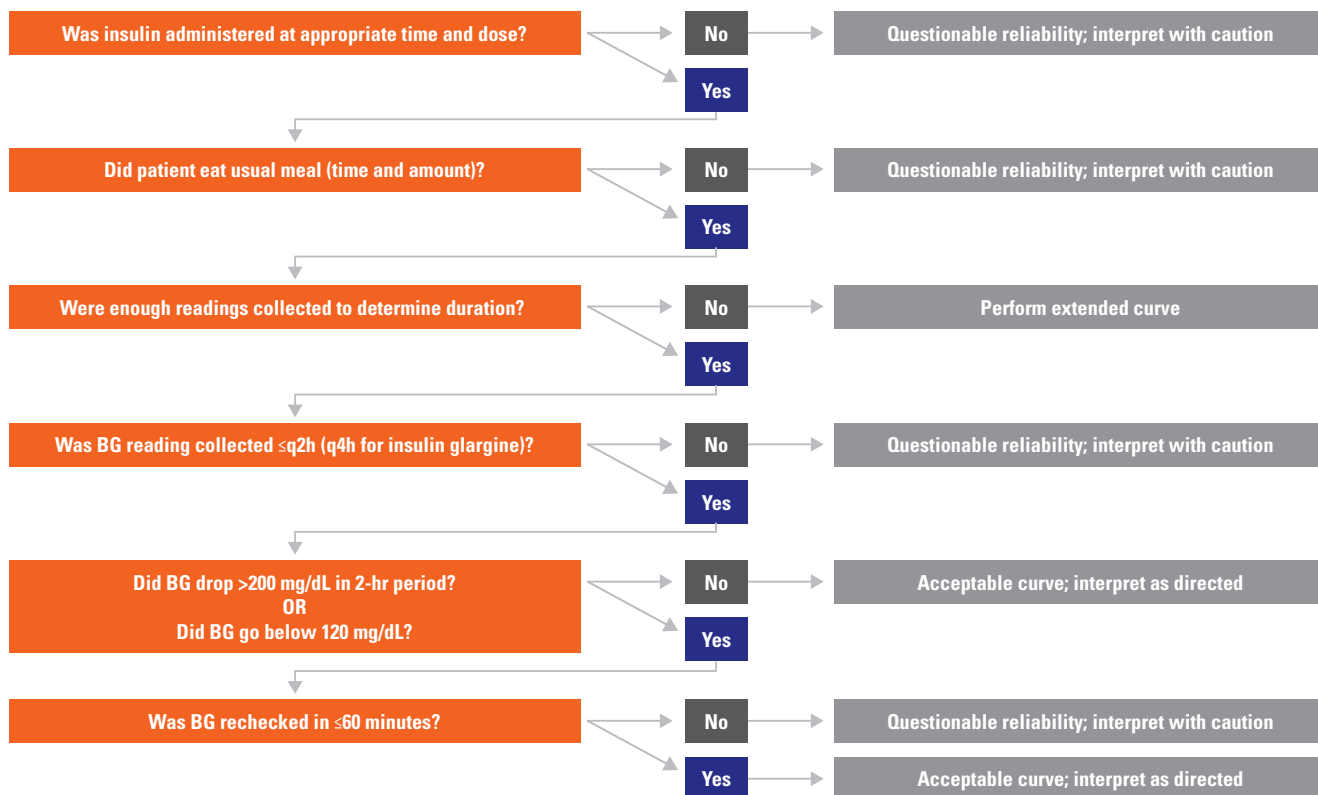
The nadir cannot be predicted by a single BG reading, because its timing may vary from day to day.

The average BG reflects both insulin responsiveness and duration of effect. As a general guideline, the target average is <250 mg/dL, which minimizes complications associated with sustained hyperglycemia, such as ketoacidosis and diabetic neuropathy.

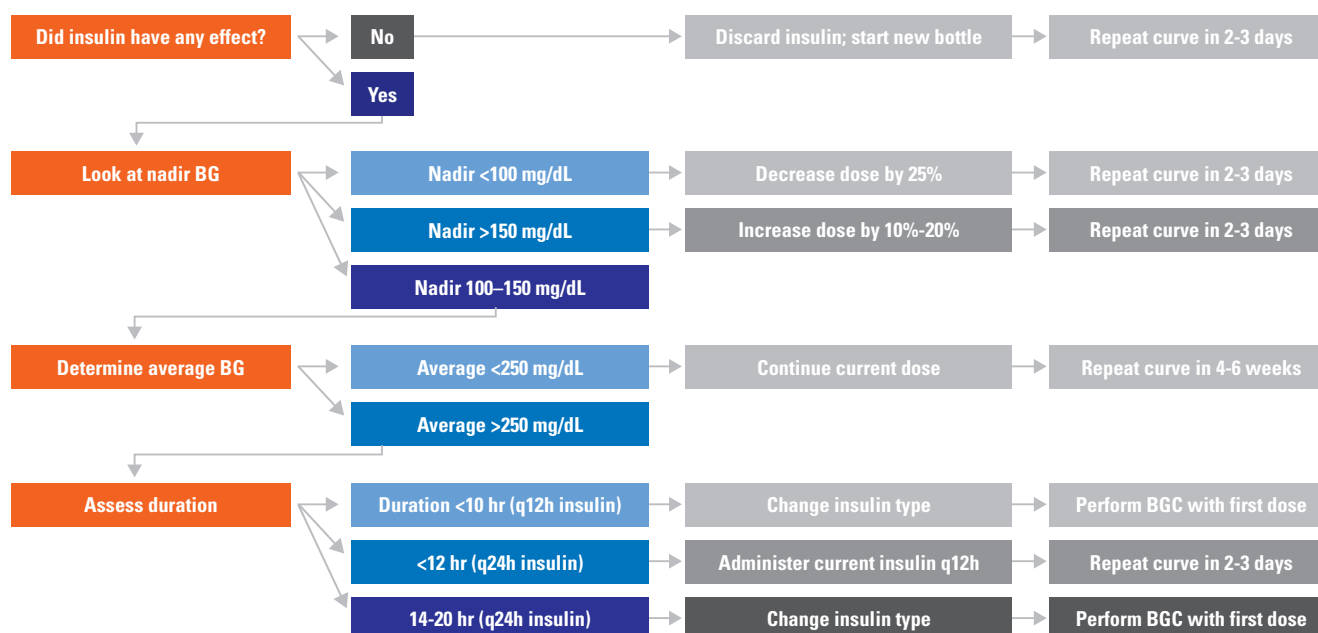
Duration of effect is defined as the interval during which BG is less than 80% of the preinsulin concentration, and is determined primarily by insulin type (ie, lente, protamine zinc, NPH, glargine, etc). If duration is unsatisfactory, the solution is usually to switch to a different type.

# Protocol for Blood Glucose Curve Evaluation

## A: Initial Evaluation



## B: Detailed Evaluation (recheck)



# A Guide to Successful Client Communication & Clinic Teamwork

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Give clients, *in writing*, specific “trigger” blood glucose numbers to prompt them to contact the clinic.



**FOR HELPFUL  
CLIENT EDUCATION  
RESOURCES VISIT**

**Veterinaryteambrief.com/  
diabeticmanagement**

## RESOURCES

A varied selection of online resources for clients and the veterinary team, including videos that show successful use of at-home blood glucose monitors, can be found at [veterinaryteambrief.com/diabeticmanagement](http://veterinaryteambrief.com/diabeticmanagement).

There are literally hundreds of websites and videos available. I strongly recommend that you thoroughly review all sites and videos you recommend to ensure that the content reflects your practice’s philosophy. Videos posted by actual clients often resonate the most; however, they must be carefully screened.

For many clients, management of a diabetic pet will seem challenging. The degree to which a client will be able to complete the veterinarian’s treatment plan depends on the ability of the veterinary team as a whole to educate and communicate positively with that client.

### 1. Evaluate Patient’s Tolerance for Treatment as Part of Initial Workup.

Determine whether the patient will tolerate capillary blood draw and identify collection site(s) most likely to yield necessary samples.

**2. Be Positive & Confident.** Convey that diabetes is not a death sentence; it can absolutely be managed and the pet can live without troubling clinical problems. If the team conveys confidence, the client is more likely to take on the treatment plan. When clients seem overwhelmed, break discussion of treatment into two phases.

**3. Identify & Address Causes of Client Resistance.** Open communication is essential. Communicate the value of the recommended treatment, emphasizing that it will improve the clients’ quality of life and reduce medical problems in their pets. Identify and address specific reasons for any reluctance to comply, including:

– **Being overwhelmed or frightened by the scale of the treatment plan.** Allow the client to start slowly: Demonstrate insulin administration and supervise the client for 5 to 7

days, *then* introduce at-home testing at a recheck or technician appointment. Most clients become comfortable with needles and giving injections after a week.

– **Financial concerns:** Rent glucose meters so clients can try them without having to commit to the plan or purchase them immediately. Note that glucose meter use will ultimately improve glycemic control, thus reducing serious diabetic complications and saving the client significant cost.

– **Time commitment/scheduling issues:** The key to success is performing treatments as close to 12 hours apart *as possible*. Allow clients to choose treatment hours that work for them. Clients need to feel that any issues they have with other time commitments can be discussed and addressed without them being made to feel that their pet is not being cared for properly.

**4. Create Clear Short- & Long-Term Treatment Goals.** Give clients, *in writing*, specific “trigger” blood glucose numbers to prompt them to contact the clinic. Such guidance gives value to home monitoring and encourages clients to return

*continues on page 8*

# Caring for Your Pet with Diabetes

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Caring for a diabetic patient requires a little extra time and effort but creates a special bond between you and your pet. Remember that your veterinary team is here to guide you every step of the way. Our goal is a contented patient with minimal signs related to high blood sugar and no episodes of hypoglycemia (low blood sugar). Blood glucose (BG) measurements guide our insulin dose adjustments. These can be taken in the clinic, but pets can get upset at the veterinarian's office, which makes the results less accurate, and we all know that our pets would much rather be at home.

Hand-held glucose meters measure BG using a tiny drop of blood and then display the value. The distribution of glucose in the blood differs among people, dogs, and cats, which is why human glucose meters are not accurate for pets. We need a number we can trust.

### **"HOW-TO" POINTERS:**

- Ask your veterinary team to help you find appropriate sites for testing
- Practice using the lancet on an orange or tomato
- Make BG testing fun by petting, providing a treat, or offering a favorite toy
- Turn on the glucose meter and get a test strip ready
- Get the lancet (or needle, if you prefer) ready for use
- Gently massage the test site with your fingers or apply a dry, warmed towel
- Deploy the lancet quickly, with firm pressure
- Hold the strip against the blood drop until the monitor beeps
- Have a cotton ball handy and apply gentle pressure on the site

You are with your pet every day and know him or her best, so you can be the eyes and ears for signs that a dose adjustment may be needed.

### **WHAT TO LOOK FOR:**

- Shaking, confusion, blindness (signs of low BG)
- Fatigue, sleeping more often (signs of high BG)
- Weight loss (suggests poor regulation)
- Increased thirst and urination (suggest poor regulation)

### **WHEN TO CALL:**

- Persistently high readings (>300 mg/dL)
- A low reading (<100 mg/dL)
- Vomiting, poor appetite
- Sudden increase in thirst and/or urination
- Abnormal urine color or odor (suggests infection)



You can be the eyes and ears of your veterinary practice for signs that a change in insulin dose may be needed.

## STEP 4: Communication Primer

when the need arises. Short-term goals include resolution of or improvement in issues associated with severe hyperglycemia, such as ketonuria and polyuria/polydipsia. Once these are achieved, then the focus can shift to the long-term goal—usually achieving durable glycemic control.

**5. Educate & Demonstrate.** Make certain that the client has a basic understanding of the disease and what you expect to accomplish through detailed oral instruction and written material. **HINT:** Ask the client to reiterate the treatment plan to enable you to identify any area of misunderstanding.

**6. Provide Long-Term Support & Follow-Up.** Proactive follow-up and support contribute to a positive client experience. Assign each client a team member, a technician with training in diabetic management, as his or her primary contact. Support

staff can receive training from the veterinarian or through reading articles such as this one and accessing the many continuing education opportunities available. Use automatic reminder systems to trigger regular calls to clients.

### TRAINING THE TEAM

Successful diabetic management depends on compliance with the treatment plan at home, which often requires involvement from the entire team. Teams that participate in training with respect to home monitoring and diabetic management are more efficient and successful with client communication and support. Keys to successful training include:

- **Understanding the Disease**
  - Use the many educational opportunities available at [veterinaryteambrief.com/diabeticmanagement](http://veterinaryteambrief.com/diabeticmanagement) or those of your own choosing.

- **Becoming Proficient at Using the Glucose Meter**

- Contact your local distributor's sales representative to arrange a "lunch and learn" for your practice.
- Use capillary blood draw as the primary method for collecting blood glucose readings in the practice. This strategy not only reduces time and resources, it also allows technicians to become comfortable with the procedure, so that they are confident and effective when demonstrating to owners.

- **Understanding the Hospital's Treatment Philosophy**

- The veterinarians should agree on and communicate *in writing* basic treatment protocols and goals for dogs and cats with uncomplicated diabetes so team members can echo these to clients.

- **Exploring & Role Playing Common Questions/Situations**

- Every practice is different. Identify the common issues that *you* encounter with clients and brainstorm as a group about how to deal with them.
- Develop as many scripts as possible to help team members deal with basic client questions and concerns. Outline how to route concerns within the team so the client receives accurate, timely information.
- Actively solicit feedback from clients and incorporate into your training and protocol.
- Role play client communication to help identify areas where miscommunication or inaccurate information may be inadvertently conveyed.

### FINANCIAL & OTHER BENEFITS OF AT-HOME GLUCOSE MONITORING

#### FOR THE OWNER

- Makes frequent clinic visits for BG monitoring unnecessary, freeing up the client's schedule and reducing stress for the pet.
- Quarterly outpatient examinations with regular consultations by phone or email cost considerably less than a full-day hospitalization with BG checks at least every 4 to 6 weeks.
- Changes in BG are detected and addressed more quickly, avoiding potentially costly emergency veterinary visits/hospitalizations.

#### FOR THE PRACTICE

- Improved pet health results in greater client satisfaction and loyalty, prompting continued patronage and more referrals.
- Reduced spending for everyday care and diabetic complications such as hypoglycemic events allows the client to spend more on preventive care.
- Reduced time and paperwork regarding hospitalization, documentation, and discussion of results with clients free up the staff for other client visits.
- Fees for in-clinic monitoring are replaced by consultation fees, including those for technician consults.
- A prepaid package including curve analysis via email or phone consults can be created:
  - After conducting the BGC, the client emails results to the veterinarian.
  - The veterinarian interprets the results and communicates his or her recommendations by email or phone.
- The sale of monitors, lancets, and strips produces revenue.

**The bottom line...patient- and client-centered medicine is priceless!** —Jessica Goodman Lee, CVPM

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