Home Monitoring of Blood Glucose: 
Practical Tips for Incorporating It into Your Practice

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Last year, the American Animal Hospital Association (AAHA) issued the AAHA Diabetes Management Guidelines for Dogs and Cats, which included the following statement: “Home monitoring of blood glucose (BG) is ideal and strongly encouraged to obtain the most accurate interpretation of glucose relative to clinical signs. Most owners are able to learn to do this with a little encouragement and interpretation of glucose results is much easier for the clinician.”

Once the veterinarian has determined the treatment protocol for a patient, my job is to create an environment in which the client can be successful in implementing and complying with the veterinarian’s treatment plan. In my career, I have had the opportunity to train hundreds of owners to successfully measure their pets’ blood glucose at home, and have seen the positive results.

While there are many schools of thought as to the most effective method of achieving glycemic control, I believe most of us would agree that appropriate application of home blood glucose monitoring in veterinary patients is a powerful tool to improve case outcome.

In the last 10 years great improvements in hand-held glucometer technology have made home monitoring of blood glucose possible for many owners of diabetic animals.
STARTING WITH STAFF...THEN CLIENTS
The most important aspect of creating a home blood glucose monitoring program in your practice is developing the ability to easily and consistently collect capillary blood samples in all animals. The entire staff should be trained in how to perform this skill.

The best way to develop this skill is to adopt capillary blood collection as the preferred method of obtaining blood glucose readings in your practice. As your staff gains experience, they will improve their skill and confidence and will be better able to both demonstrate the method to clients as well as help clients troubleshoot the process if issues arise.

Every one of our patients and clients are unique. Adjusting the blood collection technique to each client and pet’s needs is integral to success at home.

CHOOSING THE COLLECTION SITE
One of the first decisions to make is to choose what blood collection site will work best for the patient.

• Choice of site depends on the size, temperament, and physical characteristics of the pet.
• There are several sites to choose from and the best site is the one that the animal will tolerate and consistently yields an adequate sample.
• Always remember that the owner will need to be able to collect the sample at home, so a method that is safe and requires as little restraint as possible needs to be determined.

Lateral Ear Margin
The lateral ear margin is the most common collection site used in the cat, and is also generally the best tolerated (Figure 1). I have worked with cats that have had blood glucose samples drawn 2 to 4 times daily from their ears for more than 5 years with minimal scarring or bruising (Figure 2). Ear margins can be used in dogs, but generally the ears do not produce a sample as consistently as in cats. The exception to this would be in “floppy eared” dogs (Figure 3), such as spaniels.

HELPFUL HINTS: EAR MARGIN
• Do not try to actually hit the vein of the lateral ear margin with the skin prick; simply get close to it. Hitting the vein itself may result in excessive bleeding or bruising.
• In cats, work on the outside of the ear pinna and hold a cotton ball or gauze square under the pinna to prevent the ear from moving away from your needle.
• In dogs, the best samples are often collected from the inside of the ear pinna rather than the outside.

Lip Fold
I generally do not encourage using the lip—this may place the client at unnecessary risk. However, in dogs with large lip folds, such as a hound, or in very gentle dogs, this site will consistently yield an excellent blood sample (Figure 7).

Tail Base
In obese pets, especially those who will not tolerate having their feet or ears handled, clipping a small area of hair at the base of the tail and collecting blood from this area often works very well (Figure 8). See Helpful Hints box in the Elbow Callus section for tips on collection techniques.

LANCING DEVICES
A lancing device is a spring-loaded device that holds the lancet; when triggered, the lancet pricks the skin in a controlled manner. Use of lancing devices is optional; however, they are particularly helpful for clients who feel uncomfortable with free-hand skin pricks for blood sample collection.

The key to using a lancing device is to make certain that the tissue cannot move away from the needle. For instance, with ear margins, rolled-up gauze or a cotton ball should be held under the ear pinna to provide firm pressure and allow the lancing device to work.

HELPFUL HINTS: PISIFORM PAD
• This only works in pets who will tolerate having their feet handled. If the pet has issues with this, another option should be considered.
• Try using the “farrier technique”: Stand the pet up and flip the foot back toward you as you would to clean a horse’s hoof. Avoid collecting the sample with the animal laying down.

Elbow Callus
The elbow calluses are my preferred collection spot in the dog (Figure 6). Elbow calluses are not usually sensitive and generally yield excellent blood samples.

HELPFUL HINTS: ELBOW CALLUS
When collecting the sample from the elbow callus, think skin scraping: lightly pinch and hold the callus for a few seconds before you attempt blood collection; then allow a blood bubble to form before attempting to take the sample.

Pisiform (Wrist) Paw Pad
Paw pads yield excellent blood samples (Figures 4 and 5); however, collecting from the primary pads tends to be painful and often is not well tolerated by the patient. Using the non–weight-bearing pad alleviates this issue and is generally well tolerated in animals who do not mind having their feet handled.
Figure 1. The ear margin is the most commonly used blood collection site in cats.

Figure 2. This cat has had twice daily blood draws from the ear margins for 2 years. As you can see, the procedure has not caused any serious damage or trauma to the ears.

Figure 3. The inside of the dog’s ear flap often yields a more consistent sample than using the outside of the ear flap as you would in a cat.

Figure 4. A good, secondary option for sample collection in the cat is the non weight-bearing pisiform paw pad.

Figure 5. The pisiform paw pad is also a good option in dogs who do not object to having their feet handled.

Figure 6. The elbow callus in dogs, when present, is an excellent site for blood collection because it yields a consistent sample and is generally very well tolerated by the pet.

Figure 7. While we do not often suggest the lip as a collection site due to the potential for injury to the owner, in a calm dog the lip will consistently yield good blood samples.

Figure 8. The tail base is especially useful in small-breed dogs who are overweight, do not have elbow calluses, or will not tolerate having their paws handled for blood collection.
SETTING CLIENTS UP FOR SUCCESS

1. Be positive! While diabetes is a serious chronic disease, it is manageable. With the owner’s help, the veterinarian can often achieve good glycemic control, resolution of clinical signs, and a near-normal lifespan and quality of life.

2. Make a positive recommendation. In order for the client to be confident in performing blood glucose monitoring at home, the veterinarian has to make a positive recommendation for it at the time of diagnosis of diabetes (similar to recommending a urine culture if an infection is suspected). The veterinarian or staff should explain that home monitoring:
   • Enables the veterinarian to improve his or her understanding of the day-to-day effect that insulin has on blood glucose
   • Enables the client to determine whether or not he or she should give insulin
   • Alerts the client to potential emergencies or loss of glycemic control before the pet develops clinical signs.

3. Be certain you can collect blood from the pet prior to client demonstration. This is possibly the single most important part of this treatment plan. If you attempt to demonstrate the technique and are unable to draw blood easily, the owner will lose confidence and often decline the plan. In all cases, my suggestion is to:
   • Discover the best site to collect blood from the animal away from the client, prior to recommending the protocol.
   • Once you have located the best collection site and determined whether the pet is tolerant of the procedure, demonstrate the procedure to the client.
   • Even if owners have decided not to pursue home monitoring, do not shy away from collecting blood glucose samples in front of them. Oftentimes, if owners see you perform sample collection regularly, they become more amenable to trying it themselves.

4. Give the client clear, written instructions. In my experience, compliance failure is often directly linked to the absence of a clear directive from the veterinary team. Written discharge instructions should include:
   • The treatment plan
   • Specific parameters for clinical signs and blood glucose readings that should prompt the client to contact the office (For example: Call the office if you obtain 2 readings over 350 mg/dL or any readings under 100 mg/dL)
   • The follow-up schedule.

5. Be sure the client understands that a learning curve is associated with glucose monitoring. The protocol should never be portrayed as “simple” or “easy to do.” Instead, clients should be prepared for a 7- to 10-day period where they may experience some difficulty in performing glucose monitoring. If clients realize it may take a few days to acclimate, they will feel less frustrated during the learning curve, increasing the likelihood of successful monitoring.

6. Give the client permission to call or return to the hospital for help. Ideally, have a technician as the primary point of contact and encourage the client to ask for help if they have any issues with the monitoring plan. Have your staff follow up with regular calls to check in on the pet and client to find out whether they have any questions or concerns.
Clients often ask about using a human glucometer rather than purchasing a veterinary model. I believe the most important point is that clients check blood glucose at home, regardless of which glucometer they use. That said, I always strongly encourage clients to try veterinary models for several reasons:

1. As was shown in a study in 2009, there are stark differences in accuracy from meter to meter, and generally the veterinary meter, specifically the AlphaTRAK veterinary-specific handheld blood glucose monitor (abbotanimalhealth.com), was far more accurate than most human meters.

2. In my experience, veterinary meters require smaller samples, making it far easier for the owner to consistently collect blood.

3. The makers of the veterinary meters provide both educational and technical support for their veterinary customers, whereas the makers of human models do not.

No home monitoring program can be successful without client cooperation. Oftentimes, the level of client compliance you achieve will be directly related to how well you set your client up for success at initiation of treatment. See Setting Clients Up for Success for a list of valuable suggestions for communicating with clients about home blood glucose monitoring programs for their pets.

One of the factors veterinary hospitals must consider when developing home monitoring programs is determining compensation for their staff’s time. Each hospital will have to develop a pricing plan that works best for them.

We experimented with numerous pricing plans and found that clients preferred paying a single fee that covered all insulin adjustments/blood glucose log interpretation for a period of time rather than a per-interpretation fee. This is also much easier for bookkeeping purposes.

Our protocol requires quarterly checks:
- The client pays for a diabetic examination, which is approximately 2.5× our normal examination fee
- This fee also covers all blood glucose interpretation/insulin adjustments for the 3-month period.

Many clients will attempt home blood glucose monitoring if:
- It is recommended by the veterinarian
- The clients understand the benefits
- Clients receive adequate training and support from the veterinary team.

While home monitoring helps gain beneficial information, it does not replace regular rechecks with the veterinarian. However, when used appropriately, it is a powerful tool that helps the client and the veterinarian better understand the pet’s disease and make more informed decisions regarding treatment.

References

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