



Subcutaneous fluids (SQF) are used in patients needing fluid support or therapy when IV fluids are not indicated or hospitalization is not possible. SQF can help prevent dehydration in patients not eating well and in those needing intermittent fluid therapy but not hospitalization (eg, patients with chronic kidney disease [CKD]).¹ (See **Chronic Kidney Disease & SQF**, page 25.) Mild dehydration cases caused by short durations of vomiting or diarrhea may also benefit from SQF.

Subcutaneous Fluid Administration for Needle-Nervous Clients

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See client handout, **Subcutaneous Fluid Administration at Home**, page 26

Veterinary nurses can teach clients to administer SQF at home, which has several benefits:

- Home administration may lead to lower stress levels for the patient.
- SQF can encourage a client's active role in the pet's care, strengthening the human–animal bond.
- SQF can provide an alternative option for clients with financial constraints, although it may be less effective than IV fluid therapy, which requires hospitalization and skilled monitoring.

The following information should give veterinary nurses the confidence to teach clients how to administer SQF.

The Basics

- First, ensure the environment for SQF instruction is distraction-free (eg, an examination room without the patient) and all the supplies the client needs for practice are readily available. (See **Figure 1**.)
- Use a variety of techniques (eg, live demonstrations, videos, written instructions, hands-on practice) because each client absorbs information differently and should have access to learning methods that work best for him or her. (See **Resources**.)

Setup Review

Most patients will be prescribed SQF for ongoing at-home treatment and have several bags of fluids dispensed at a time.

- Describe to the client the type of fluid the veterinarian has prescribed, show him or her the bag in the packaging, and demonstrate how to properly open the package.
- Point out the bottom of the fluid bag and the port that will be used to insert the drip set, explaining how it differs from the injection port.

Clamp & Pin Operation

Allow the client to actively participate until he or she feels comfortable with this step.

- Open the drip set packaging and demonstrate how both the roller clamp and the slide or clip clamp on the fluid line operate. Allow the client to practice operating both clamps, and show him or her that closed clamps will not move on the fluid line, but open clamps will move freely.
- Allow the client to insert the drip set piercing pin into the fluid bag with one or both clamps closed (see **Figure 2**, page 22) until he or she is accustomed to the force required to access the fluid.



▲ **FIGURE 1** A bag of fluids, a fluid administration or drip set, and needles are necessary for at-home SQF administration.

Resources

- Administering subcutaneous fluids [video]. Mar Vista Animal Medical Center. [youtube.com/watch?v=-4Ta537YEOU](https://www.youtube.com/watch?v=-4Ta537YEOU)
- How to give subcutaneous fluids to your cat at home [video]. Youtube.com. [youtube.com/watch?v=TtSzMudgx78](https://www.youtube.com/watch?v=TtSzMudgx78)

Needle safety is critical when teaching clients how to deliver subcutaneous fluids at home.



▲ **FIGURE 2** The client should spike the bag with the piercing pin on the drip set and ensure the bag is not punctured.

Photos courtesy of Liz Hughston, MEd, RVT, CVT, VTS (SAIM, ECC)

- Make sure the client knows to push in the piercing pin until its hard plastic ridge is flush with the edge of the tube accessing the fluid bag, and explain that inserting the piercing pin at an angle may puncture the fluid bag. Also, emphasize the importance of keeping the piercing pin from touching anything to prevent contamination.

Fluid Administration

Show the client the drip chamber where he or she will monitor the rate of fluid administered to the pet. Explain what constitutes a good rate and what indicates the needle has been properly inserted. Again, allow the client to practice.

- Demonstrate how to adjust the fluid level in the drip chamber. Ask the client to practice filling the chamber and emptying it back into the fluid bag until he or she is comfortable with the process.
- Have the client again practice filling the fluid line with the clamps. Remind the client to watch the drip chamber while filling the line and note the changes in speed flow based on the tightness of the clamp on the line.
- Review with the client the fluid amount that will be administered each time, and demonstrate how to read the measurements on the bag. Clients may find masking tape helpful for indicating when the prescribed volume has been administered.

TAKE ACTION ✓

- 1 Many clients are afraid of needles and the veterinary team should be well-trained to educate clients thoroughly, both at the practice and with material to take home, to help allay any concerns.
- 2 When teaching clients SQF administration, allow them to practice the procedure as many times as they need to feel comfortable.

Needle Safety

Needle safety is critical when teaching clients how to deliver SQF at home. Many do not have experience with needles of any kind; some may be intimidated by the thought of sticking their pet, while others may need to overcome a general fear of needles. The following steps will prepare clients for safe and effective needle use.

- Show the client how to open the needle package.
- Review the construction of the needle (ie, hub, shaft, bevel, point) and show the client how the open end is perfectly sized to fit on the end of the fluid line.
- Explain that touching any part of the needle other than the hub can introduce contamination and the client should ensure he or she touches only the hub.
- Demonstrate removing the cap and recapping the needle, and allow the client to practice. Some clients will want to uncap and recap the needle several times to feel comfortable with the action.
- When removing and discarding the needle without recapping is difficult, as may be the case with SQF, using a one-handed recapping technique is acceptable. (See **The One-Handed Needle Recapping Technique**, page 25.)
- Remind the client that the needles are sharp and every effort should be made to avoid a needle stick of any person.
- Show the client how to attach the needle to the end of the fluid line and how to remove it, and allow him or her to practice.

Needle Use

When demonstrating proper needle insertion, use a towel as a stand-in for the patient. A towel provides more resistance to the needle than the patient's skin and allows the client to practice performing a quick, decisive stick.

- Ask clients to imagine the towel is their pet's back, from the base of the skull to the back of the shoulder blades. Pull the towel up to create a tent. (See **Figure 3**.) Have the client feel the tension formed in the tent door (ie, the triangle formed when the towel is pulled up) and encourage him or her to practice creating and feeling the tent.

Extra Tips for At-Home SQF Administration

- Advise clients on potential spaces in their home that allow for confinement (eg, walk-in closets, bathrooms).
- Emphasize the importance of an elevation differential between the fluid bag and the patient to ensure fast flow of fluid. (See **Figure 5**, page 24.)
- Remind clients a second person may be necessary initially to help restrain the patient until both client and pet are accustomed to the procedure.
- Assure clients many pets—if not most—accept SQF readily and adapt well to the treatment.
- Be sure clients know a small amount of blood-tinged leakage can be expected once fluid has been administered.



▲ **FIGURE 3** The veterinary nurse can use a towel to simulate the skin tent needed to create a subcutaneous space for fluid administration. The client can practice inserting the needle into the towel.

Allow clients to practice as many times as they need to feel comfortable and confident in their ability to safely perform the needle stick.



▲ **FIGURE 4** An approved sharps container is made of thick, puncture-proof plastic with a sealable lid.



▲ **FIGURE 5** A walk-in closet offers excellent confinement for the pet's at-home SQF administration and also makes elevating the fluid bag easy.

- Show the client how to insert the needle into the towel tent with the bevel up, explaining the point is the sharpest part of the needle and the least traumatic or painful for the patient. Instruct the client to insert the needle into the towel up to the hub.
- Explain that the client should change the insertion point on the pet each time fluid is administered to avoid creating scar tissue. Once the needle is in place, let the client operate the clamp and watch the fluid flow in the drip chamber when there is no resistance to the flow of fluid in the line.

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Needle Disposal

Clients must know how to safely dispose of used needles at home. In many states, veterinarians are barred from accepting used needles from clients, but many pharmacies and medical offices provide needle return services as long as the needles are disposed of in an approved sharps container. (See **Figure 4**.)

Mail-in sharps disposal services also can be purchased at local pharmacies. All used needles must be discarded safely to avoid possible injury.

- Strongly emphasize safe needle disposal during the SQF lesson. Most clients find leaving the used needle on the end of the fluid line the easiest way to keep the end of the line clean, but that potentially allows bacterial growth and contamination. Best practice is to immediately replace the needle with a clean needle labeled as such.
- Remind clients to use a fresh needle every time they provide SQF, and be sure to supply enough needles for the duration of prescribed treatment, including

several extra in case clients need to reinject the pet. (See **Extra Tips for At-Home SQF Administration**, page 23.)

Conclusion

Any client can be taught to provide SQF therapy at home. Education is crucial for making clients feel confident and secure, and if they are effectively taught the required skills, they may find SQF administration a rewarding experience that gives them an active role in promoting their pet's health. ■

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FUN FACT: When Liz was growing up in San Francisco, she attended rodeo camp every summer for 10 years. She can rope a calf, tie a goat, and herd cattle!

Chronic Kidney Disease & SQF

Chronic kidney disease (CKD) is characterized by structural or functional deficiencies (or both) that have been detectable for 3 months or longer in one or both kidneys,² leading to a progressive loss of the ability to³:

- Concentrate urine
- Excrete waste products
- Maintain proper electrolyte balance
- Produce hormones

Because the kidneys cannot concentrate the urine, free water is lost, leading to dehydration that in turn leads to decreased flow through the glomeruli and increased plasma concentrations of waste products, particularly nitrogenous waste in the form of urea (ie, blood urea nitrogen [BUN]).

In CKD patients, uremia (ie, increased BUN) is a primary cause of clinical signs (eg, vomiting, anorexia, weight loss, lethargy, ulcerations of the mucous membranes) that lead to poor quality of life. SQF helps prevent dehydration, dilute waste products in plasma, and reduce BUN, all which improve quality of life.^{3,4}

The One-Handed Needle Recapping Technique⁵

- **STEP 1:** Place the cap of the needle on a flat surface (eg, floor, countertop).
- **STEP 2:** Holding the needle hub or the end of the fluid line with the needle attached, slip the needle into the cap without using the other hand. Pushing against a firm, heavy object (eg, a wall or baseboard if on the floor, the backsplash if on a counter) may help.
- **STEP 3:** Push the capped needle against the wall or backsplash, using only the hand holding the needle hub or the end of the fluid line, until the cap is "seated" on the needle—it will click when the cap is secure. Alternatively, tip the capped needle so the cap's end is against the floor or counter and push until the cap is seated.

Subcutaneous Fluid Administration at Home

Even with the best education before you leave the practice, you may have questions about SQF administration when you and your pet get home. This handout should provide answers to your most frequently asked questions, make you feel confident, and help ensure treatments go smoothly for you and your pet.

■ **THERE ARE BUBBLES IN THE LINE—WILL THEY HURT MY PET?**

Small bubbles in the line will not harm your pet. However, if you are concerned about them, simply open the clamps and allow fluid to run through the line until the bubbles are gone.

■ **I PUT THE NEEDLE IN AND OPENED THE CLAMP, BUT FLUID IS GOING EVERYWHERE! WHAT SHOULD I DO?**

The needle may have gone through one side of the pinched skin and out the other, allowing fluid to flow through the hole created. This can happen if the tent in the skin is not high enough or if the needle enters at an angle rather than parallel to the pet's spine.

To resolve this problem, pull the needle back slightly and adjust the angle, or remove the needle completely and try again. The same needle can be used for 2 attempts. If a third attempt is needed, use a fresh needle.¹

■ **THE FLUID IS NOT FLOWING IN THE DRIP CHAMBER. WHAT IS WRONG?**

First, make sure the line is open and not clamped. If the line is open and has not collapsed on itself where the clamp has been, adjust the needle by either moving it further in, pulling it back slightly, or adjusting the angle. If these methods are unsuccessful, create a larger space under the skin by pulling up on the skin tent.

■ **THE FLUID I GAVE LAST TIME IS STILL THERE. SHOULD I GIVE THE NEXT DOSE?**

Do not give the next dose if the fluid has not been absorbed completely. Contact the veterinary practice because the patient may need to be examined and the dose volume or frequency adjusted.

■ **THE DRIP CHAMBER IS FULL OF FLUID AND I CANNOT SEE THE FLUID DRIPPING.**

To remove fluid from the drip chamber, fill the chamber completely by squeezing it gently until it is as full as possible. Once the drip chamber is completely full, turn it and the bag upside down, and squeeze the fluid from the chamber back into the fluid bag.

Reference

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Download a printable handout at brief.vet/sqf-handout

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