



Abstract

Placing a urinary catheter in a female dog can be challenging, mostly because of the infrequency of the procedure and anatomical variations in each patient. Indications for urinary catheterization are to measure urine output, relieve urethral obstruction, and administer medications. Necessary supplies include catheters, sterile lubrication, sterile gloves, and collection systems. Catheter type and size affect comfort and efficacy. Foley catheters are preferred for indwelling use. The placement technique, either digital or visualization, is determined by patient size. Potential complications include urethral tears and urinary tract infections. Catheter care involves regular cleaning and vigilant monitoring for signs of infection and/or other complications.

**EMERGENCY MEDICINE/CRITICAL CARE**

Urinary Catheter Placement in Female Dogs

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Placing a urinary catheter in a female dog can be a challenging procedure. In many clinics, female catheterization is not frequently performed, which makes it even more difficult. A patient's size, anatomy, and any abnormalities can also present challenges. This article reviews different methods of placing a urinary catheter in a female canine patient and briefly discusses the general nursing care of a patient with an indwelling urinary catheter.

WHY PLACE A URINARY CATHETER?

There are multiple reasons to place a urinary catheter. A urinary catheter can facilitate measurement of urine output, relieve a urethral obstruction, encourage cleanliness in a nonambulatory patient, and provide a route for administering medications directly into the bladder.

Take-Home Points

- Inserting a urinary catheter into a female dog can be challenging because it is infrequently performed and because of variations in patient size and genitourinary anatomy.
- Urinary catheters facilitate various essential functions including measuring urine output, relieving urethral obstruction, and administering medications directly into the bladder.
- The risk for potential complications, such as urethral tears and urinary tract infections, must be carefully considered in each patient, especially those with coagulopathies and urethral abnormalities.
- Successful catheterization requires having appropriate supplies and selecting the applicable catheter type and size.
- Urinary catheter placement techniques (digital or visualization) vary according to patient size.
- Proper catheter care involves regular cleaning, monitoring for complications, and prompt intervention if signs of infection occur.



Although generally considered a benign procedure, urinary catheterization does have risks for complications. Due to the sensitive nature of urethral tissue, appropriate catheter sizing and adequate lubrication are important to prevent microtears, which can lead to inflammation and hemorrhage (of particular concern in a patient with a coagulopathy). Although documentation of such cases is lacking in the current veterinary literature, reports from human medicine highlight the potential for near-fatal hemorrhage after catheterization.¹ In veterinary patients with a coagulopathic comorbidity, ample caution is warranted if urinary catheter placement is indicated. Careful consideration of the risk to the patient should be considered before placing the catheter. Additionally, prudence should be exercised in patients with known urethral tears; however, urethral tears are reported less often in female patients than male patients. Additional attentiveness is necessary in patients with diarrhea due to a heightened risk for fecal contamination; increased nursing care is necessary to mitigate infection risks.

SUPPLIES

An appropriately sized catheter, sterile water-based lubrication, sterile gloves, and a collection system are minimally needed for urinary catheterization (**FIGURE 1**). An antiseptic, such as chlorhexidine or iodine, is recommended for flushing the vulva before catheter placement. Hair clippers may be necessary to remove excess hair around the vulva. Additionally, instruments, as discussed later in this article, may be required for visualizing the urethra.

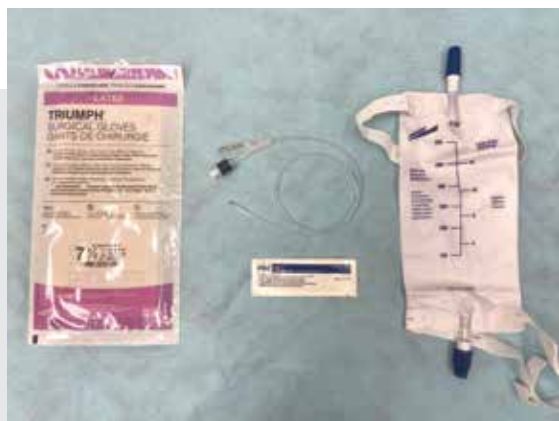


FIGURE 1. Minimum supplies needed to place a urinary catheter: sterile gloves, sterile lubrication, catheter, and collection system.

Catheter type and size affect patient comfort and catheter effectiveness. The most commonly used types are red rubber catheters and Foley catheters. Red rubber catheters are made of latex that provides some flexibility. Those catheters are a good option for a patient that is intermittently catheterized and does not require an indwelling catheter. However, red rubber catheters commonly leak. Foley catheters are preferred for indwelling catheters. These catheters are made from a silicone material that is softer and less likely to irritate the bladder and urethra. Furthermore, the design of a Foley catheter discourages leakage around the catheter by having a balloon at its tip. Before inserting the catheter, inflate the balloon to ensure it has no defects. After confirming that the balloon is intact, deflate the balloon for placement. When the balloon is inflated with sterile saline or water in the bladder, it rests on the bladder neck, which prevents urine from leaking and the catheter from slipping out of the bladder.

Both types of catheters come in a variety of sizes to suit any patient. There are no determinate guidelines to help select the appropriate catheter size. Experience will help guide this decision. **TABLE 1** can be used as a guideline to estimate the appropriate catheter size for a patient's weight. However, a patient's clinical signs, body condition score, and other factors must also be considered.

The collection system needs to be sterile and easy to empty while also ensuring urine flows in 1 direction. Traditionally, IV-fluid bags have been used. Although they are sterile, sterility is difficult to maintain when the bag is being emptied. Also, IV-fluid bags do not have a structural way to prevent urine from flowing back into a patient. If an IV-fluid bag is used, the bag must be lower than the patient at all times and must be

TABLE 1 Approximate Urinary Catheter Size According to Patient Weight

WEIGHT, LB	FRENCH SIZE	OUTER DIAMETER, MM
<15	4	1.3
	5	1.7
15–39	6	2
	8	2.7
40–80	10	3.3
	12	4
>80	14	4.7
	16	5.3



discarded after being emptied. If a patient needs to be moved, the IV tubing must be clamped to prevent urine from flowing back into the bladder while being moved. Because the IV tubing needs to be clamped for transport, the hospital must have a protocol in place to ensure the line is unclamped after transport. Several companies in the veterinary market offer urine collection systems. These systems provide an easy and sterile way to collect urine and empty the system as well as prevent urine from flowing back into a patient by 1-way valves within the collection system.

PLACEMENT TECHNIQUES

Digital Method

The digital method of placing a urinary catheter involves the use of a gloved and lubricated finger to guide the catheter through the urethra into the bladder (**FIGURE 2**) and is the most common method used to catheterize female canine patients. The procedure requires a sterile environment, urinary catheter, sterile lubricant, sterile gloves, and antiseptic solution. The patient should be sedated to the point of musculoskeletal relaxation, then placed in sternal or lateral recumbency (**FIGURE 3**). A veterinary assistant may be needed to elevate the tail as well as clip hair and clean the area immediately surrounding the vulva with an antiseptic solution.



FIGURE 2. Digital method being used to insert a urinary catheter. Due to patient size, the veterinary nurse is using his pinky finger to guide the catheter into the urethra.



If a patient needs to be moved, the IV tubing must be clamped to prevent urine from flowing back into the bladder while being moved.

Before donning sterile gloves, ensure hands are clean and jewelry is removed. Apply a generous amount of sterile lubricant to the sterile field and finger. Insert the finger into the vulva and pass it over the pelvic ridge. Identify the larger vaginal opening dorsal to the smaller urethral opening and occlude with finger. With the other hand, lubricate the urinary catheter and pass that under the occluding finger. The catheter will pass into the urethra and subsequently into the bladder. If there is resistance or the catheter begins to retreat, the catheter may have entered the vaginal canal.

Visualization Methods

For patients in which the urethral opening is not easy to see or possible to feel, there are several ways to enhance visualization. Vaginal speculums can be used, yet many do not have a light source; an assistant may be required to provide light. Oscopes can be used, yet they are better for larger dogs (**FIGURE 4**). When the urethral opening is visible, a urinary catheter can be inserted into the vulva while an otoscope is used to



FIGURE 3. Patient positioned in sternal recumbency. Hindlimbs should be placed in a comfortable position and towels should be placed under the patient for comfort.



guide placement. A rigid or flexible endoscope can also be used; however, this technique is not common due to the required setup and reprocessing time.

Laryngoscopes can be used in medium to large patients. The laryngoscope blade is inserted into the vulva with the handle facing up, then the vulva is pulled caudally toward the veterinary nurse (**FIGURE 5**). To maintain sterility, this method usually requires an assistant to



FIGURE 4. An otoscope used to visualize the urethra.



FIGURE 5. A laryngoscope used to visualize the urethra.

hold the laryngoscope and vulva for the veterinary nurse placing the catheter.

TEACUP BREEDS AND SMALL DOGS

Patients that are too small for the digital method or any of the above visualization methods pose a challenge. It is often best to treat small dogs like cats and implement a blind technique. The patient is placed in ventral recumbency. The vulva is pulled toward the veterinary nurse placing the catheter, and the catheter is advanced on the ventral aspect of the vagina. Alternatively, the patient can be placed in dorsal recumbency with its hindlegs moved cranially until the opening of the vulva is facing the ceiling. Then, the catheter is inserted, staying on the ventral aspect of the vagina.

CONFIRMING CATHETER PLACEMENT

When the catheter is correctly placed, urine will flow. Manual suction with a syringe may be necessary for bladders that contain a smaller volume of urine. Appropriate placement should be confirmed with radiography. After placement is confirmed, remove the stylet. If using a Foley catheter, inflate the balloon. If using a red rubber catheter, place a winged piece of bandage tape on the tube near the vulva and secure it



FIGURE 6. The collection bag should be placed in a clean container to help prevent contamination. Do not place the collection system above the patient.



with a suture. Attach a urine collection system to the catheter to close the line, monitor output, and prevent infection.

CATHETER CARE

Always wear gloves when handling urinary catheters. Clean the patient's perineum and perivulvar area minimally every 24 hours with gentle soap and water or cleansing wipes. If the area is becoming soiled, increase the frequency of cleaning. The catheter itself should be cleaned with a solution of 0.5% to 2% dilute chlorhexidine up to 3 times per day. The solution can be applied to sterile gauze to wipe the tubing outside of the patient. The same solution can also be used to flush the vaginal vault during cleaning.

Place the collection bag in a clean container and monitor the urine collection system for disconnection, leakage of urine, or line occlusion (**FIGURE 6**). If the system is compromised, it should be replaced. Document urine output every 4 hours. The veterinarian should be alerted if the output reflects oliguria to anuria (range of 0 to 0.5 ml/kg/hr).

Monitor the patient for signs of infection, including fever, lethargy, inappetence, vomiting, irritation at the vulva, pyuria, and pigmenturia or hematuria. Infection can be confirmed by urinalysis and urine culture. Strategies to minimize the risk for a catheter-associated urinary tract infection include not leaving a catheter in place for more than 72 consecutive hours and daily assessment of the catheter and surrounding area along with maintenance.²⁻⁴ The best way to prevent infection is to avoid urinary catheterization if it is not necessary. Prophylactic antibiotic treatment is not recommended as it increases the risk for antibiotic resistance.²⁻⁴

SUMMARY

Urinary catheter placement in female dogs requires familiarity with various placement techniques and meticulous postprocedural care. The procedure offers invaluable diagnostic and therapeutic benefits, yet practitioners must carefully consider potential complications. Proper selection of catheter type and size, coupled with vigilant monitoring and maintenance, can mitigate risks and enhance a patient's outcome. Emphasizing infection prevention through prudent catheter use underscores the value of clinical judgment and evidence-based medicine in veterinary practice. **TVN**

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