



**Ettinger: Textbook of Veterinary Internal
Medicine, 7th Edition
Bacterial Urinary Tract Infection
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What is a bacterial UTI?

A *urinary tract infection* (UTI) refers usually to a bacterial infection of any or all parts of the urinary tract but most commonly the urinary bladder (called *bacterial cystitis*). A UTI is common in dogs, especially females. They are uncommon in cats less than 10 years of age. Cats more than 10 years of age, however, have a higher risk and a UTI is often associated with other diseases.

Two things must happen for a bacterial UTI to occur:

1. A break, either temporary or permanent, in the animal's defenses
2. Bacteria must migrate into the urinary tract, catch hold, and multiply

The UTI may or may not be associated with symptoms.

What are the symptoms of a bacterial UTI?

Symptoms of a bacterial UTI may or may not be present and are dependent on which part(s) of the urinary system is/are infected. The urinary bladder is most often infected, which then causes urgency and irritation.

Other symptoms may include the following:

- Blood in urine (hematuria)
- Straining to urinate (stranguria)
- Foul-smelling urine
- Urination in inappropriate places
- Inability to hold urine
- Urinating small volumes or not passing any urine despite posturing to urinate

Less commonly, a bacterial UTI may involve one or both kidneys. Again, obvious problems may not be present. When present, however, they may include the following:

- Fever
- Abdominal pain
- Inappetance
- Lethargy
- Blood in urine

- Vomiting

In reproductively intact dogs and cats, the infection may also involve parts of the genital system (uterus in females or prostate in males) and clinical signs may relate to the infection in these locations.

These described symptoms do not always mean that a UTI is present. All of these problems may occur because of diseases other than a UTI. For example, many cats less than 10 years of age do not have a UTI but are more likely to have uninfected inflammation (cystitis) or urinary stones. The symptoms are the same as those observed with a UTI. The presence of blood in urine does not mean that a UTI is present.

What tests are needed?

To diagnose a UTI, your veterinarian should collect a urine sample from your pet. The best method to collect urine is by a technique called *cystocentesis*, which a needle is inserted through the body wall into the bladder and urine is removed by a syringe. This technique is very safe and painless to your pet. Your veterinarian will analyze this urine sample (urinalysis) and examine a small amount under a microscope. If bacteria and/or white blood cells (WBC's) are present, your veterinarian will suggest performing a urine culture. The presence of white blood cells means that inflammation is present but does not necessarily mean a UTI is present. Likewise, in animals whose immune system is compromised, a UTI may be present, but the urinalysis may not reveal white blood cells or bacteria. A urine culture is the best method for confirming a UTI is present.

A urine culture involves sending a small part of the collected urine to a laboratory that will try to grow the bacteria on culture plates. If no bacteria grow, then no UTI is present. If bacteria grow, however, then the organism will be identified and antimicrobial susceptibility will be performed. Antimicrobial susceptibility testing usually takes 1 day for bacteria to grow and an additional 1 to 2 days for identification and antimicrobial susceptibility testing result to come back if there is bacterial growth.

In some animals, additional testing may need to be done, such as blood work or imaging studies (x-rays, ultrasound, scoping, etc.), because a bacterial UTI may occur as a result of or in combination with other diseases (e.g., bladder stones, chronic kidney failure, feline leukemia virus).

What treatment is needed?

Antibiotics are prescribed to treat bacterial UTIs. How long antibiotics need to be given to your dog or cat depends on several factors, including whether it is a dog or cat, the age of the animal, whether this is a first time UTI or a recurrence of a UTI, what the bacterial organism is, and what antibiotics it is sensitive to, and if complicating factors are associated with the UTI.

In general, a UTI is treated as follows:

- A simple (or uncomplicated UTI) occurs primarily in spayed female dogs and is not associated with systemic illness or complicating diseases. In this case, antibiotics are given for 10 to 14 days.
- A complicated UTI occurs when there are complicating diseases, if the UTI is recurrent, if your dog is reproductively intact, and in most cats. Remember, that young cats infrequently have a UTI and in older cats there is usually a complicating chronic kidney failure. Another example of a complicating disease is diabetes mellitus or hyperadrenocorticism (Cushing's disease). In animals with a complicated UTI, antibiotics should be given 3 to 6 weeks and a urine culture should be evaluated partway through the treatment to make sure the UTI is under control, and again after the antibiotic treatment is finished to make sure the UTI is cleared.

Although other treatments are sometimes recommended (i.e., cranberry juice), no conclusive evidence proves they are benefit in dogs and cats. Antibiotic treatment is the best way to get rid of a bacterial UTI.

How is a bacterial UTI prevented?

In most instances nothing specific can be done to prevent a UTI from occurring. Your dog or cat should be re-evaluated if clinical signs recur. With complicated UTI, your veterinarian should periodically evaluate your pet to make sure that the UTI has not recurred or is under control. In some animals, a urinary antiseptic or an antibiotic must be given long term to prophylactically prevent a UTI from occurring. If prophylactic antibiotic treatment is necessary, a low dose of the antibiotic is usually given to your dog or cat once a day at nighttime so that the antibiotic that is passed into the urine is allowed to concentrate in the urinary bladder.