

Brookville Road Animal Hospital

8049 Brookville Road, Indianapolis, IN 46239

phone: (317) 353-6143

Home Care Instructions

Diet: It is strongly recommended that he/she be fed exclusively Hills C/D Multi, canned or dry, or Royal Canin Urinary SO, canned or dry. These foods can help prevent the occurrence of urinary crystals. Additionally, canned cat food increases moisture intake. In cats with history of urethral obstruction this strongly correlates with a lower likelihood of re-obstruction. Water fountains, tuna juice, low-sodium chicken broth also can be added to his everyday routine.

Additional Instructions/Comments:

- Monitor urination output for the next 7 days. If no urine noted in a 12 hour period or straining to urinate seek veterinary attention as soon as possible.
- Schedule recheck exam in 7 days.
- He/she is most likely to re-obstruct over the next 7 days. It is very important to monitor him/her closely over this time period.
- Please see www.indoorcat.org for further information regarding feline urinary health and for additional ways to enrich his environment to help decrease the chance of re-obstruction.

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By Wendy C. Brooks, DVM, DipABVP

Educational Director, VeterinaryPartner.com

Urinary Blockage


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Recognizing the Emergency

We have already described the signs of feline idiopathic cystitis (F.I.C.) as straining to urinate, bloody urine etc. If the cat is a male, he is at risk for an especially life-threatening complication of this syndrome: the urinary blockage.

Mucus, crystals and even tiny bladder stones can clump together to form a plug in the narrow male cat urethra. The opening is so small that it does not take a lot to completely or even partially obstruct urine flow. Only a few drops of urine are produced or sometimes no urine at all is produced.

It is hard to tell when a cat is blocked as the inflammation, urgency, and non-productive straining also accompany cystitis whether or not there is a blockage. The easiest way to tell is by feeling in the belly for a distended bladder. It is often the size of a peach and if there is an obstruction the bladder will be about as hard and firm as a peach. (Normal bladders are usually soft like partly filled water balloons, and non-obstructed inflamed bladders are usually very small or empty). Still, while this size and texture difference is obvious to the veterinarian, most pet owners are not able to feel for the bladder correctly. If there is any question about whether a male cat is blocked, he should be taken to the vet for evaluation as soon as possible.

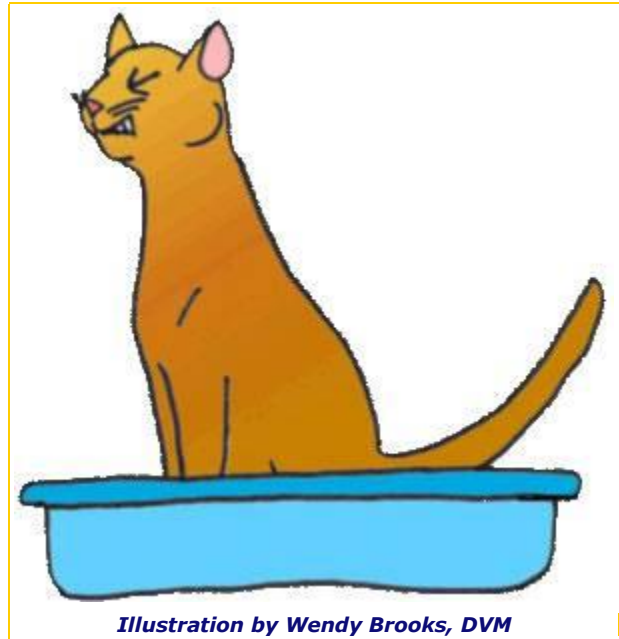


Illustration by Wendy Brooks, DVM

If the blockage persists 3 to 6 days, the toxin build up will result in death.

DO NOT PUT OFF HAVING THE CAT CHECKED!

Confirmation and Assessment

The veterinarian will feel the bladder in the abdomen and attempt to express urine. Sometimes gentle pressure will actually expel the obstruction but usually the cat will require more aggressive means of relief. The blocked cat will be assessed for dehydration and toxin build up. The urinary toxins that build up in obstructions commonly cause vomiting, nausea, and appetite loss. They can also cause life-threatening heart rhythm disturbances. Your cat is assessed for all these complications as they will need to be addressed.

A partial blockage can be just as serious as a complete blockage. Treatment is usually the same.

If the blockage persists for longer than 24 hours, urinary toxins will have started to build up in the system.

Initial Treatment

The single most important thing for the obstructed cat is to have the blockage removed. This is done by placing a urinary catheter through the urethral opening and either through the obstruction itself, or using pulses of flushing solution to move the plug back into the bladder where it can be dissolved. This procedure is often painful and sedation will most likely be needed. Some cats are unblocked with great difficulty only. Some cats cannot be unblocked and must have an emergency perineal urethrostomy to re-establish urine flow (see below for details on this surgery).

Fortunately, most cats are successfully unblocked. The urinary catheter is sewn in place and will stay in place for a couple of days. Often a urinary collection bag is attached to the catheter so that urine production can be measured. Sometimes, the bladder is filled with sterile fluid and flushed out to remove crystals, inflammatory debris, and blood.

When the blocked cat has filled his bladder to capacity, his kidneys stop making urine as there is nowhere for it to go. Once urine flow returns, the kidneys quickly begin to correct the metabolic disasters that have been taking place. Often an extremely sick blocked cat can be snatched literally from the jaws of death by having proper fluid support and by re-establishing urine production. It is amazing how efficient the working kidneys can be in restoring the body's balance; still, it is important to realize that this is a serious condition and not every cat can be saved.

Occasionally a cat is brought in soon after blocking and achieves an excellent urinary stream immediately after unblocking. These cats may be able to proceed with treatment without having to spend a few days in the hospital or without having to have the catheter sewn into place. Most blocked cats do not fit into this category but it is important to realize that some cats are able to avoid more aggressive treatment.

Further, in the event of extreme budget limitations on the owner's part, a blocked cat can be unblocked quickly and returned to the owner for aftercare. This is not a good idea as the cat is likely to need additional support for the best chance of survival; still, given that leaving the cat blocked would be cruel and ultimately end in the cat's death, this may be an alternative in some cases.

What Happens during Hospitalization?

The kidneys do most of the work during the recovery phase. The cat must wear a type of collar that prevents biting at or removing the crucial urinary catheter. Urine production is monitored closely as after the obstruction is relieved often dramatic urine volumes are produced. (This is called post obstructive diuresis and if the cat is not drinking on his own, it is crucial that his fluid therapy matches the volumes produced as urine. If they do not, he will dehydrate.) Fluid therapy is given either intravenously or under the skin, depending on the degree of support needed by the cat. Medications are given to relieve pain and relax the irritated urethra.

After a couple of days of catheterization, the catheter is removed and the patient is observed for re-blockage. He will not be allowed to go home until his urine stream seems strong and relatively easy. Some cats will leak urine at this point as it is painful for them to engage in normal pushing; this is generally a temporary problem. Once he seems to be urinating reliably on his own, he will be released for home care.

What to Watch for at Home after Discharge from the Hospital

In an ideal world, owners can learn how to feel the abdomen for a firm obstructed bladder. This is hard to teach at discharge mostly because at this point, the cat is pretty sore. There will usually be medications and dietary recommendations to go home with the cat.

It is crucial to realize that the cat is at risk for re-blocking for a good week or two from the time of discharge.

This is because the irritation syndrome that led to blocking in the first place is still continuing and as long as the episode continues, blocking is a possibility.

At home, the same straining and possibly bloody urine will still be produced. It is important for the owner to be aware of urine volume being produced and of bladder size, if possible. Any loss of appetite or vomiting should be reported to the veterinarian at once. If there is any concern about reblocking, the veterinarian can determine fairly easily if the cat has re-blocked.

Most cats recover uneventfully and most do not need continuing medication after they have recovered. Some cats, especially if they have blocked before, will require on-going treatment. Once the cat is no longer obstructed, management is the same as for any other cat with **feline idiopathic cystitis** that is not obstructed.

Occasionally the bladder over-stretches while it is blocked and is permanently damaged. Such cats require medication to help them contract and empty their bladders normally. This is unusual but one should be aware of the possibility.

The Perineal Urethrostomy

Urinary blockage is almost exclusively a problem reserved for males. This is because the female urethra is shorter and broader and thus far more difficult to obstruct. When urinary blockage becomes recurrent in a male cat, it becomes time to consider surgical reconstruction of the genitalia to create a more female-like opening. This surgery is called the perineal urethrostomy or PU for short. Basically, the penis is removed and a new urinary opening is made.

Before considering this surgery, here are some considerations:

- This surgery is done to prevent obstruction of the urinary tract. It does not prevent feline idiopathic cystitis. This means the cat is likely to continue to experience recurring bloody urine, straining etc. He just will not be able to block and complicate the situation.
- Cats with perineal urethrostomies are predisposed to bladder infections and infection-related bladder stones. The University of Minnesota currently recommends that male cats with perineal urethrostomies have regular periodic urine cultures even if they are asymptomatic. This basically means that your cat should go to the vet to be tested 3 or 4 times a year for urine cultures.

What you need to know if you are Considering this Procedure for your Cat

- The metabolic complications from the urinary blockage should be resolved before the surgery is performed. In some emergency situations this is not possible (the male cat cannot always be unblocked with a urinary catheter and a new urinary opening may have to be constructed on an emergency basis.) Residual urinary toxin build up is an important risk factor that should be eliminated or minimized if possible.
- Shredded paper or pelleted newspaper litter should be used during the 10 days following surgery. Clay and sand litter may stick to the incision and disrupt healing.
- The most serious complication that can occur post-operatively is scar (stricture) formation. This causes a narrowing of the urinary opening and the surgery may have to be revised.
- In theory, local nerve damage can occur during the surgery leading to urinary and/or fecal incontinence. Obviously these are disasters for a household pet but fortunately this is a very rare complication.
- As mentioned, regular urine cultures are recommended for cats with perineal urethrostomies.

Date Published: 6/4/2002 9:57:00 AM

Date Reviewed/Revised: 12/13/2010

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Feline Idiopathic Cystitis

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(The disease formerly known as FUS and FLUTD)

Feline lower urinary tract disease, or feline idiopathic cystitis, is the term describing the following group of clinical signs:

- bloody urine
- straining to urinate (can easily be mistaken for straining to defecate)
- urinating in unusual places
- urinary blockage (almost exclusively a male cat problem and constitutes an emergency)
- licking the urinary opening (usually due to pain).

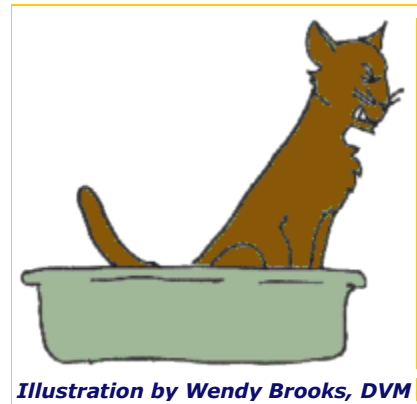
A cat need only demonstrate some of these signs to be considered affected.

This syndrome has been described in cats for nearly 100 years and continues to be a common condition. The chief obstacle in eradicating this condition seems to be that any number of inflammatory conditions (infection, tumor, bladder stone, etc.) in the urinary bladder will produce the same symptoms. This condition has been called feline urologic syndrome, and was later re-named feline lower urinary tract disease.

Sorting out Causes

The average age of a cat with FLUTD is 4 years. Of all cats with FLUTD:

- 50% will not have a cause that can be identified despite extensive testing.
- 20% will have bladder stones.
- 20% will have a urethral blockage.
- 1-5% will have a true infection.
- 1-5% will have a urinary tract cancer.
- 1-5% will have had trauma to the urinary tract (i.e., have been hit by a car etc.)
- 1-5% will have a combination of a bladder stone and an infection.




Hundreds of studies have been conducted to determine which causes are most likely for which cats. What has emerged from these studies is that for young adult cats, a definitive cause for the syndrome we call FLUTD cannot usually be found. These cats are said to have feline idiopathic cystitis or FIC, which means bladder inflammation of unknown cause.

What Happens to Cats with FIC?

As the struggle to understand this common but confusing syndrome continues, some features of FIC have been observed:

- Lower urinary tract signs tend to recur.
- There seems to be an association with environmental stress.

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- FIC seems to be a younger cat's problem, with episodes decreasing in frequency as the cat gets older.
- Urinary crystals, previously believed to be central to the syndrome, seem to be involved only peripherally.
- Numerous therapies have been used to curtail the episode once it has started but because the episode seems to last a week or two regardless of treatment, it is hard to be sure what is working.
- As difficult as it is to address an episode in progress, more success has been achieved in preventing future episodes.

Why Do only some Cats get FIC?

We know that cats that get this syndrome have a unique imbalance in the way their brain controls hormones. In other words, these cats are unusually sensitive to environmental stress and, due to a complicated cascade of metabolic events, stress manifests in the urinary tract.

There are two parts of therapy: treating the episode and preventing future episodes.

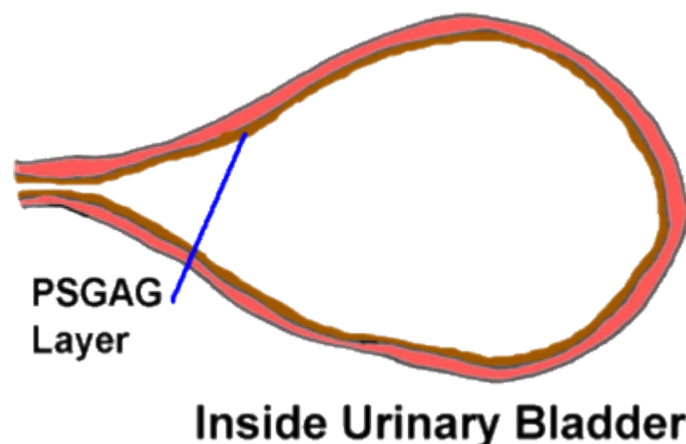
Treatment of the Non-Obstructed Cat

Such patients include:

- Most female cats with FIC.
- Male cats with FIC that do not have a urethral obstruction.
- Male cats with FIC who have had their urethral obstruction relieved but are still suffering from their present FIC episode.

As we have mentioned, no definitive therapy has emerged for reliably curtailing the episode; still, we have a great deal of theory.

Defective Mucous Lining Theory



The urinary bladder is lined with a type of glycoproteins called PSGAGs. This material basically insulates the tissue of the bladder from the urine it contains. Urine can vary greatly in pH and can contain abrasive crystals in addition to assorted toxins and irritants that the kidneys have removed from the bloodstream and concentrated.

If the lining of the bladder becomes patchy, the tissue of the bladder is directly exposed to the urine and inflammation results. According to this theory, treatment might center on replenishing the

PSGAGs that line the bladder, or distending the bladder periodically so as to deplete the painful inflammatory chemicals the bladder tissue has to release.

Dietary/Urinary pH Theory

Years ago it was commonly held that because commercial cat food was high in plant-based proteins (such as soy or grain), it could alter the urinary pH and lead to crystal formation, and that those crystals led to inflammation. This theory was later modified to include an interaction of urinary pH and dietary magnesium content leading to crystals and bladder inflammation. A massive reformulation of commercial cat food occurred in the late 1980s and the incidence of FIC rapidly decreased. Yet, FIC did not disappear completely, which tells us that this theory only fit some cases of FIC. Still, obstructed male cats most certainly show crystals in their urinary plugs. There are currently different types of crystals involved in these plugs. Addressing crystals, especially in male cats, continues to be included in therapy for FIC.

Environmental Stress Theory

There has always seemed to be a link between environmental stress and FIC and now that a neurohormone link has been discovered, it is clear that many FIC cats can benefit from environmental manipulation. What is not clear is whether or not medication for anxiety can actually curtail an existing episode.

Aside from theoretical methods of limiting the duration of the episode, it is important to also consider the patient's pain. Painful urination can be excruciating and often therapy will include analgesics, urethral dilators, and muscle relaxants.

Since no single therapy has emerged to treat the existing FIC episode, often treatments are selected to cover multiple theories. The following medications are commonly used in the face of an FIC episode in progress.

Anti-spasmodics and tranquilizers

These medications help the painful urethral spasms that occur with the inflammation associated with the episode. They also help the urethra dilate so that urine can pass. Typical medications might include: acepromazine, phenoxybenzamine, or diazepam.

Antibiotics

While true infection is not typically involved in FIC, antibiotics are still commonly prescribed. There is controversy about antibiotic use since research seems to indicate that antibiotics may not alter the course of a typical episode. Antibiotics cover the 1-2% of cats that truly do have infection and some feel that some antibiotics have additional anti-inflammatory properties separate from their antibacterial ones.

Urine acidifiers

These are not used as commonly as they were in the past. The idea behind them is to assist in the dissolution of struvite crystals. They are still prescribed in some cases, but the approach is somewhat controversial given that most diets have been acidified already. It is also important to note that some cats have crystals made of oxalate stones, which will be exacerbated by acidifiers. Still, this therapy is sometimes prescribed especially if struvite crystals are seen in large numbers on the urinalysis report.

Prednisone/steroid anti-inflammatories

These medications are anti-inflammatory and may help with the swelling and pain but they can also promote infections in catheterized patients. These medications are probably not best used in patients who have received urinary catheters. Research suggests that they do not alter the course of the episode; however, many feel they help with the pain.

Narcotic analgesics

These medications are straight pain-relievers with no anti-inflammatory effects. Their effects often include euphoria and relaxation which can assist in keeping the urethra relaxed and spasm free. Typical medications might include the fentanyl patch, buprenorphine, tramadol, or others.

Anti-anxiety medications

These medications address the stress component that is believed to have been the trigger the episode

to start with. The problem seems to be that these medications typically require several weeks to reach maximum effect in most patients and the FIC episode has generally resolved on its own before that. This suggests that these medications are better for preventing future episodes rather than for curtailing an active episode. Still, some patients seem to respond very quickly to this type of therapy so it may be worthwhile. Typical medications include: amitriptyline, clomipramine, and fluoxetine.

Elmiron and Adequan

These medications may strengthen and thicken the mucous lining in the bladder. At first developed to increase lubrication and decrease inflammation within arthritic joints, one theory of this disease is that the mucous lining of the bladder becomes disrupted in some cats, leading to an inflammatory reaction within the bladder wall and the consequences are the FLUTD syndrome.

Subcutaneous fluids

Two purposes are achieved by giving fluids under the skin. The first is distending the bladder. There is evidence that as the bladder wall stretches, inflammatory chemicals are released into the urine. By depleting the bladder wall of its inflammatory chemicals, there is less on-going pain. The other goal in giving extra fluids is dilution of the urine, meaning that any irritants the urine contains will be diluted and rendered less noxious. Fluids may be given as a one-time dose in the hospital or as a continuing therapy at home.

Prevention of Future Episodes

Many management strategies have been proposed to prevent further episodes of this painful and potentially life-threatening condition but only some techniques have been proven effective:

- Feeding primarily canned food/Increasing water consumption
- Environmental enrichment/Relieving environmental stress

Canned foods/water consumption

By increasing the amount of water consumed by the cat, the bladder is more distended and the urine is more diluted (as described above in the subcutaneous fluid section). Canned cat food is 80% water so simply switching to canned foods will increase a cat's water consumption. Also, filling the water bowl while the cat is watching or getting a drinking fountain encourages the cat to take a drink. This recommendation stems from a study of cats that had urinary blockages and were divided into two groups, one receiving Waltham urinary S/O diet canned and one receiving the same food dry. None of the cats on the canned version had subsequent urinary episodes during the time of the study while there was some recurrence in the other group.

Environmental enrichment

One might think a cat has plenty of toys and seems relaxed and well-adjusted but the reality is that the cat's natural environment of living in the forest and hunting and eating mice regularly throughout the day is a far cry from sitting on a sofa, eating processed foods, and eliminating waste in a plastic box filled with clay. Most cats are fine with the domestic lifestyle but the FIC cat is special and has special sensitivity. Stress can be minimized by allowing choices for the cat in terms of where to play, rest, eat, and eliminate.

Here is a summary of recommendations that have been published:

- Each cat at home should have the opportunity to play with the owner or with another cat if he chooses to.
- Each cat should be able to move freely about her home including climbing if she chooses to.
- Each cat should have convenient access to a private rest area where other animals will not disturb him or an escape route should he be bothered. There should be no loud appliances in the rest area that might suddenly come on and be frightening.
- Scratching posts should be available.

- Toys should be regularly rotated and replaced.
- Each cat should be able to choose warmer and cooler areas within the home.
- There should be a litter box for each cat, ideally plus one extra. Litter boxes should be located in well-ventilated areas and should be kept clean. Boxes should be washed out weekly with a minimally scented detergent. Unscented clumping litter seems to be best. If there is more than one floor in the home, there should be a box on each floor. Litter boxes should be private enough that other animals will not be bothering the cat and loud appliances will not startle the cat during litter box use.
- Each cat should have her own food and water bowls. Feeding/watering stations should be safe so that other animals (like dogs) will not be startling the cat. Bowls should be washed daily.
- The brand, flavor, or format of the food (dry vs. canned) should be kept fairly constant. If it is changed, allow your cat a choice of new food vs. old food at least for a while before changing over, and do not change more than once a month.

Many people are surprised to find that environmental enrichment has been effective in prevention since it does not involve medication or diets but it is important to remember that what makes a cat vulnerable to FIC is a problem with the neurochemicals involved in stress.

For more information on environmental enrichment, read about the [Indoor Cat Initiative](#).

Date Published: 1/1/2001

Date Reviewed/Revised: 12/09/2009