

## Feline Lower Urinary Tract Disease



Most cat owners are aware of F.U.S. or Feline Urological Syndrome. Recently several experts have suggested the use of the term Feline Lower Urinary Tract Disease, or FLUTD, because it more correctly encompasses all the forms and the diverse causes of the disease.

Feline Lower Urinary Tract Disease is a condition in which stones or crystals may form in the urinary tract – and there are a variety of causes.

FLUTD accounts for nearly 10% of all cat admissions to veterinary hospitals and without proper nutritional management, obstructive FLUTD recurs at the depressing rate of 50 to 70%.

The syndrome can occur in any age of cat and sometimes with very little warning. The purpose of this article is to help you understand the complex causes and management of this dreadful condition and enable you to spot it in your own cat at an early stage because a cat with a blockage due to FLUTD is indeed a true medical emergency.

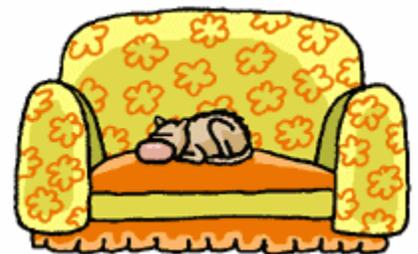
### WHAT CAUSES FLUTD?

Although this disease complex has been intensively studied for decades, it is still an enigma. Many diverse and fundamentally different factors that may be single, multiple and interacting, or unrelated have been implicated in the cause or development of FLUTD. Dr. Carl Osbourne, a leading researcher in this field, postulated the causative factors outlined below:

Infections	Urethral Plugs	Stones	Other causes
<ul style="list-style-type: none"> <li>• Bacterial</li> <li>• Fungal</li> <li>• Parasitic</li> <li>• Viral</li> </ul>	<ul style="list-style-type: none"> <li>• Struvite crystals</li> <li>• Matrix and struvite crystals</li> <li>• Matrix and other crystals</li> <li>• Matrix only</li> </ul>	<ul style="list-style-type: none"> <li>• Struvite</li> <li>• Calcium phosphate</li> <li>• Calcium oxalate</li> <li>• Ammonium urate</li> <li>• Cystine</li> <li>• Xanthine</li> </ul>	<ul style="list-style-type: none"> <li>• Anatomical abnormalities</li> <li>• Trauma</li> <li>• Neoplasia</li> <li>• Iatrogenic</li> <li>• Idiopathic</li> </ul>

### Related factors include:

- **Time of year** A higher incidence has been reported in late winter and early spring. Perhaps due to months of decreased activity, and in many areas, forced confinement.
- **Obesity** Several studies have found increased risk with increased weight – does this also correlate with inactivity?
- **Hereditary** There is little doubt that your cat's genes will have an important part to play in the susceptibility to this disease.
- **Vitamin A deficiency** This myth must be debunked. While it is very true that vitamin A deficiency causes sloughing of cells, and this could contribute to plug formation, in actual fact, vitamin A deficiency is extremely rare and therefore not a real contributing factor. Neither will additional vitamin A be of any benefit.



Despite the exhaustive nature of these factors, in real life, the majority of cases of urethral obstruction are associated with the formation of struvite crystals – and we refer to this as obstructive FLUTD.

Obstructive FLUTD is a condition in which stones or crystals form in the cat's urinary tract – these stones or crystals may then obstruct urine flow and irritate the delicate lining of the urethra and bladder. These areas then become irritated and inflamed causing further shedding of cells – these cells, together with the crystals already present form “urethral plugs”. The signs of FLUTD in your cat will depend on quantity of these plugs and will vary from difficult urination; to bloody urine; to complete blockage of the cat's urethra and penis. ***This is and excruciatingly painful condition and is potentially fatal. Immediate veterinary attention is paramount – the blockage MUST be relieved quickly as this is a life threatening condition!***



## **ANATOMY**

For background information, let's discuss how the urinary tract works. The kidneys filter blood and remove the waste products of metabolism to form urine. Urine flows constantly from the kidneys through two tubes, called ureters, to the bladder where it is stored. When the cat urinates, the urine is excreted through another tube called the urethra, which runs to the exterior.

When a cat is suffering from FLUTD, the blockage of the urethra can partially or totally prevent urination. The bladder then becomes massively distended with urine – since it is not being eliminated. Within a very short time period, the excess bladder pressure prevents kidney function and we have the start of a disaster. Without functioning kidneys, poisonous waste substances cannot be removed from the body and a state of self intoxication exists – this is known as uremia. Uremia is a life threatening condition.

## **HOW DO I KNOW IF MY CAT IS AFFECTED?**

Watch for the following signs:

- A housebroken cat that suddenly becomes “dirty”, change it's habits and urinates on the floor, in the bathtub, or in the sink.
- Frequent trips to the litterbox. Squatting and straining to pass small drops of urine. Don't mistake this for constipation; laxatives at this stage could kill your cat by causing spasms which could rupture the massively distended bladder. Don't risk it – see your veterinarian immediately if suspicion exists.
- Traces of blood in the urine and / or a strong and pungent ammonia-like smell.
- Excessive “yowling” and / or licking of the lower abdomen.
- Listlessness, depression, vomiting, or poor appetite.



## **WHAT IS THE INCIDENCE OF FLUTD?**

Research indicates that about 1% of the cat population is affected each year. It is most common in adults. It affects both males and females. The males, due to anatomical consideration, are more susceptible to urethral blockage – while females are more likely to develop the non-obstructive form of FLUTD.

## **DIET & FLUTD:**

Probably more research has gone into the nutritional aspect of this disease than anything else. The long held theory that “ash” is the key factor has long been discarded. What's this “Low Ash” theory all about? The total mineral content of your cat's diet as measured by laboratory analysis is called “ash”. During analysis, the food sample is burnt and because the minerals don't burn, the ash that is left over reflects the total amount of minerals in the diet. These minerals, such as calcium, phosphorous, magnesium, sodium, iron, etc., are all essential to your cat's well being and must be provided in the correct proportions in the diet to meet the nutritional requirements of the animals. In the early days, many low ash cat foods may have been deficient in calcium or had other mineral imbalances.

The observation that struvite crystals, which account for the vast majority of cases, were formed from magnesium and phosphorous further let to the erroneous belief that magnesium may be the villain. Numerous studies certainly have demonstrated that the addition of magnesium salts can induce the

development of obstructive FLUTD, however, the quantity of magnesium added to these experimental diets was way in excess to that typically found in commercial cat food. Even more importantly that this, the magnesium salts used in these studies had an alkalinizing effect on the cat's urine, and we already know that an alkaline urine predisposes the cat to the disease!

Even more recent data indicated that if magnesium chloride, the acidifying salt of magnesium, is added to an experimental diet, no crystals or obstructions occurred. We now believe that neither the total ash content nor the magnesium content are of MAJOR importance. The major dietary factor contributing to the development of FLUTD seems to be whether the diet is able to produce an acid urine in the cat. We know that in acidic urine conditions there is little or no struvite production and this seems to be the case even if abnormally high levels of magnesium are fed to the cat. Currently the specialty diets used to treat obstructive FLUTD have controlled levels of magnesium and aim to produce moderately acid urine.



### **WHAT DO WE REALLY KNOW?**

- We know that diet modification can prevent, or at the very least reduce, the formation of struvite crystals.
  - We know that diet modification can even be used to dissolve struvite stones.
  - We know that about two thirds of all obstructive case are due to struvite.
- It has been established that diets designed to limit struvite formation are unquestionably appropriate and extremely beneficial for cats that have already had obstructive FLUTD. Without dietary modification these cats WILL usually regress.
  - On the other hand, we all know that about one third of all obstructive cases are due to other minerals, of which the most common is the calcium stone or urolith – these must be surgically removed.
  - We also know that not all cats will obstruct.

### **HOW TO REDUCE THE RISK:**

- ✓ Schedule regular veterinary checkups – particularly urinalysis if your cat has had the condition before.
- ✓ If your veterinarian advises a special diet – *use it religiously until told otherwise!*
- ✓ Make sure your cat always has access to fresh water.
- ✓ Make sure the litterbox is regularly cleaned and in it's usual place. This should be such as to give the cat some privacy.
- ✓ Encourage play and exercise – this is even more important if your cat is confined.
- ✓ Do not allow your cat to become obese.
- ✓ Pay attention to your cat.

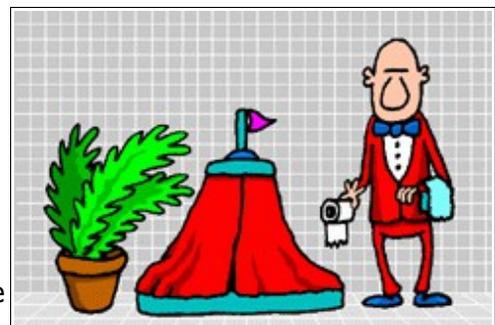
### **FEEDING CATS WITH NO HISTORY OF FLUTD**

Should all cats be fed a diet designed to treat and / or prevent FLUTD?

*Answer: There is no diet that can prevent ALL forms of FLUTD.*

As we have already seen not all cases of the condition are caused by struvite and it is in this type of condition that special diets are beneficial. So what is one to do? Surely this is where good old common sense comes into play and we have to weigh up the pros and cons – rather like an insurance company – what are the odds, or what are the probabilities.

We know that the magnesium levels are not of *major* importance – but they certainly are of some importance – all the minerals are. We know that a diet that produces an acid urine is *very important*, but this too must be in moderation – too acidic urine could produce metabolic acidosis and even Calcium oxalate stones. So, quite clearly, everything must be in moderation. If a manufacturer is producing a



specialty diet with the intention of preventing obstructive FLUTD it should also meet all the other dietary needs of the cat. If it doesn't do this it's a poor diet.

Many major manufacturers now make diets that are capable of reducing or preventing the struvite problem – and this still is *the major cause* – by using one of these diets you certainly are addressing the major cause of the problem. So, by understanding the “odds” – a more rational choice can be made. Therefore be guided by your veterinarian's decision on which product to use for your cat.

Although current research is intense, no manufacturer has yet produced a diet that will prevent ALL forms of the disease – and it is essential that you fully understand the complexity of the controversy of the situation.

