



Urinary health: how water and 'water supplements' can help in the management of feline lower urinary tract disease



Sarah M. A. Caney BVSc PhD DSAM (Feline)

Abstract

Encouraging water intake is an important recommendation in cats suffering from lower urinary tract disease (FLUTD), irrespective of the cause. A variety of tactics exist for achieving this including feeding a moist diet, feeding specially formulated therapeutic 'urinary' diets and using supplements which help to increase voluntary water intake. Attention to the type, number and location of water bowls can be of help. A successful outcome often requires some experimentation so that each cat's individual preferences can be identified and supported. Carers can assess the success of their efforts in a number of ways including free catch urine specific gravity measurement; an ideal outcome would be urine with a specific gravity of 1.030 to 1.035.

Key words

FLUTD, urinary, water intake, diet, supplement

Background

Encouraging drinking and intake of additional fluids is a key recommendation for all cats with FLUTD, irrespective of the cause. Evidence to support this recommendation includes a decreased risk of recurrent obstruction in cats treated medically for urethral obstruction (Eisenberg et al 2013) and reduced recurrence of feline idiopathic cystitis (Markwell et al 1999, Gunn-Moore and Shenoy 2004). The author typically aims for urine specific gravity levels of around 1.030 to 1.035 following interventions.

There are a number of reasons why increased fluid intake is thought beneficial in cats with FLUTD:

- Dilution of crystals and solutes discourages formation of stones in cats vulnerable to urolithiasis
- Dilution of crystals reduces the risk of urethral plug formation
- Encouragement of more frequent urination reduces the time available for stones to form within the urinary tract and therefore assists in reducing the risk of stone recurrence
- Dilution of irritant components of the urine such as potassium reduces irritation to the bladder lining
- Feeding a wet diet may make a positive contribution towards environmental enrichment through the aroma, sight, mouth feel and owner interaction involved with this form of feeding
- Similarly some of the other tactics designed to increase voluntary water intake such as moving water sources may provide environmental enrichment

Choice of diet to increase fluid intake

In general, where possible, a wet rather than dry food is recommended as a 'straightforward' method for increasing fluid consumption. Cats eating a wet food will typically take in more fluids than they would choose to voluntarily consume if eating a dry food. Specially formulated therapeutic 'urinary' diets should be prioritised for cats with FLUTD since they have additional potential benefits for these cats. Nutritional strategies for management of FLUTD are discussed in more detail in a separate article.

One modification in certain dry formulations of therapeutic urinary diets is increased sodium levels which have been shown to encourage thirst and production of more dilute urine (Hawthorne and Markwell 2004), thus potentially benefitting many cats with FLUTD – especially those resistant to transitioning to a wet food. Safety data for older cats and those with renal disease have been contradictory with one study revealing that renal parameters worsened in cats with CKD receiving a sodium-supplemented diet (Kirk et al 2006) whilst more recent prospective studies have indicated no adverse renal or cardiovascular consequences in cats receiving the food for prolonged periods (Reynolds et al 2013, Chetboul et al 2014). Manufacturers of sodium-supplemented therapeutic diets currently list CKD and cardiovascular disease as contraindications to feeding this food.

Additional food-related strategies to increase water consumption

Carers should be encouraged to consider adding extra water to whichever food is being offered: wet or dry. A very gradual approach is most likely to be successful – starting by adding 1-2 teaspoons of warm water to the food and increasing from there, according to how well it is tolerated by the cat. Some cats are prepared to eat a 'soup' rather than standard consistency of cat food. Surprisingly, some cats will eat dry kibble with added water whilst refusing the moist version of the same food! If adding tap water to the food is not tolerated, then adding a flavoured water (see below) may be worth trying.

Broths can be created by carers as a supplement to a standard commercial therapeutic diet and may offer an increased possibility of fluid intake. For example, chicken or fish can be poached in water and then liquidised to make a broth. An increasing number of commercially

available complementary cat foods are now available in a 'soup' or 'stew' formulations and may also help to encourage fluid intake. Since these are complementary foods, they should be used alongside a complete cat food, ideally a therapeutic urinary diet for cats with FLUTD.

Recently, Purina® launched a complementary nutritional supplement (Purina® Pro Plan® HC Hydra Care™) which has been shown to increase water intake, reduce USG and reduce urine osmolality in cats receiving it (Zanghi et al 2018). Purina® Pro Plan® HC Hydra Care™ is a nutrient enriched soft jelly which contains whey protein, poultry digest, glycerol and electrolytes. Whilst low in calories, it is very palatable: cats offered a choice of tap water and Purina® Pro Plan® HC Hydra Care™ preferentially consumed more of the Purina® Pro Plan® HC Hydra Care™ in one study. The cats in this study were reported to produce a larger volume of more dilute urine throughout the two month study period (Zanghi et al 2018). Purina® recommends that one 85 g pouch is offered per 2 kg body weight so, for most cats one to two pouches per day. The product should be offered in a separate bowl to food and water.

Drinking receptacles

Choice of water bowl type can have an impact on voluntary water intake. Most cats prefer glass, ceramic or stainless steel bowls rather than plastic which may taint the taste of the water. Advising carers to experiment by offering different shapes and sizes of bowl can be helpful. Most cats like wide, shallow bowls but some like drinking out of a tall glass, jug or even a mug (Fig 1). If a tall glass is a preferred receptacle then it can help to place this on a non-slip mat or even use adhesive stickers to reduce the risk of the tumbler being knocked over. Receptacles should be filled 'to the



(Fig 1)

brim' with a visible meniscus since cats do not like to place their heads inside bowls or touch their whiskers on the sides of bowls.

Water bowls should be available in all of the areas of the home that the cat spends time in. For example for households on more than one level, water bowls should be present on all levels.

In multi-cat households, ensuring adequate resources for all of the cats is key – as a minimum there should be one water bowl per social group plus one extra (Ellis et al 2013). Even better is to have one water bowl per cat plus one extra! For older cats, having plenty of water bowls in all locations is especially important if mobility disorders such as osteoarthritis are present. Cats with osteoarthritis affecting their cervical spine or forelimbs may also appreciate access to a raised food and water bowl (Fig 2).



(Fig 2)

The water bowls should not be next to a food bowl or litter tray or in a busy or over-looked location. Instead, all bowls should be in calm, quiet places that are easily accessible to the cat.

Moving water sources are popular with some cats and may encourage drinking (Fig 3). Examples include a dripping tap/shower into a basin/bath, placing a table tennis ball in a large shallow water bowl for the cat to play with, and water fountains. A large number of water fountains are available but unfortunately it is not always possible to predict which of these will be popular with the cat. Some fountains have quite noisy motors which can put off very timid cats; several are made from plastic which may not be ideal for the cat as discussed above. Unfortunately published studies show little or only a small increase in water consumption



(Fig 3)

with fountains (Grant, 2010; Pachel and Neilsen 2010) although this strategy may be successful in some individuals and was thought one factor associated with a reduced risk of recurrence in a series of cats receiving medical management for urethral obstruction (Eisenberg et al 2013).

Type of water offered

When attempting to encourage drinking, carers should be mindful that cats may have different preferences for 'water' depending on the characteristics of the local tap water. It can therefore be helpful to offer a variety of 'waters' for the cat to choose from – for example tap water, collected rainwater, mineral water – and see if a clear preference is evident. The bowl should be cleaned and rinsed and water refreshed daily to avoid offering stale water.

Temperature of water offered

Chilled water is likely to be less appealing; water should be offered at ambient room temperature. Individual cats have different preferences – for example some of the author's patients have liked licking the condensation that forms on the surface of a bottle of frozen water after its removal from the freezer and others have liked licking an ice cube added to their food or water bowl – so some experimentation is sensible!

Flavoured waters

Flavoured waters can be offered as a drink or added to the food to increase the water content. Home-prepared flavoured waters include:

- Liquidised cooked prawns in water to create a prawn-infused liquid
- Drained 'juice' from a tin of tuna in spring water
- Water that has been used to poach chicken or fish. Once cooked and cooled, the water can

be offered as a drink. This liquid can also be frozen in an ice cube tray with an individual 'cube' added to the standard water bowl in an attempt to increase the palatability of the water

In some countries, commercial flavoured waters are marketed for cats. The author has no experience of these products. Carers should avoid offering salty liquids or those containing garlic or onion which are toxic to cats. Cow's milk is not recommended since it may cause diarrhoea in some cats.

Encouraging urination

Risk factors for FLUTD include a sedentary lifestyle and infrequent urination. Encouraging water intake assists in encouraging more frequent urination but it is also essential to offer optimal toileting facilities which include the following:

- All cats with FLUTD should be provided with a litter box – even if they have free access outdoors and previously have chosen to urinate outside the home
- There should be adequate numbers of litter boxes in the household. As a general rule there should be one for each cat plus one extra and these should be in different locations so there is no opportunity for one cat to prevent access to the litter box by another
- Litter boxes should be generous in size and rectangular in shape: each should be at least 1.5 times the length of the cat's body from nose to tail base
- Litter boxes must be easy to access and easy for the cat to get in and out of: for elderly cats with osteoarthritis, having a low sided access point is important
- Litter boxes should be placed on each level of the home (if multi-level)
- Most cats prefer a fine, sandy consistency, unscented, clumping cat litter: this is most comfortable for the cat to stand on and is most inviting to them as a substrate. Faeces and clumps of urine should be removed at least twice a day and the entire tray emptied, cleaned and refilled once a week
- Most cats prefer a litter box which is not covered
- Perfumed litters and litter tray liners should be avoided: these are all orientated towards the owner and not the cat!

When making changes to toileting facilities, carers should be advised to add new boxes which conform to the recommendations above and allow the cat free choice between the 'old' and 'new' boxes. Typically the 'new' box will be preferable and once in use, the 'old' boxes can be removed.

Other tips for success

Any changes to the cat's diet or water regime should be made slowly – for example if adding water to the food then do this very gradually to encourage acceptance. Dietary transitions should take place over 5-10 days rather than a shorter period. Changes to the type of bowl used and locations should be made slowly so that carers can spot which changes are popular with the cat. Carers should be advised to be persistent and not daunted if their initial strategies do not meet with success.

Monitoring success of the above strategies

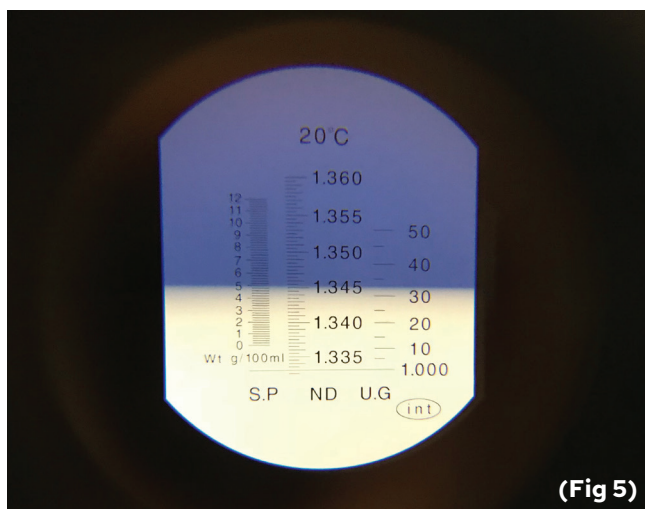
Tactics to encourage fluid intake often require significant carer dedication and commitment. Having some way of assessing the success of these strategies is an advantage in motivating and supporting carers. Monitoring options available vary according to the household set-up – for example single versus multi-cat and whether the cat goes outside the home to drink and/or urinate. Depending on the household set-up, it may be possible to monitor the following:

- Water consumption per day
- Number of urinations per day: most cats pass urine twice daily
- Volume of urine passed per day: this can be assessed crudely by 'eye-balling' the size of urine clumps in the litter box (Fig 4) or, more objectively, by weighing the litter tray pre- and post-urination



(Fig 4)

- Monitor free catch urine specific gravity (USG) measurements with a refractometer (Fig 5). The author considers a reduction in USG to 1.030-1.035 to be a good response.



Other situations where encouraging drinking may be of benefit

Whilst this article has focussed on the benefits and strategies for increasing fluid intake in cats with FLUTD, there are other situations where encouraging drinking may be beneficial, including:

- Cats suffering from chronic constipation benefit from additional water intake in softening faeces and making these easier to pass

- Older cats, especially those with mobility disorders, may not drink as much as they need and therefore may be vulnerable to dehydration
- Cats with chronic kidney disease (CKD) are vulnerable to dehydration due to their inability to produce concentrated urine and therefore benefit from strategies aimed at supporting optimal hydration. Cow's milk should be avoided in cats with CKD since it is high in phosphate.
- Cats living in multi-cat households where access to resources may be competitive may benefit from increased provision of water sources

Summary

A variety of tactics can be helpful in increasing fluid intake in cats with FLUTD and are likely to reduce the risk of recurrent FLUTD. Carers should be encouraged to try as many of the above tactics as they can and to support whichever tactics work for their cat. It is often possible to achieve good results through use of one or more of the strategies described. Monitoring USG is often helpful in supporting and motivating carers to continue to encourage fluid intake in their cat.

Figures and legends

1. Experimenting with different types of water receptacles is helpful – this cat appreciated drinking out of a mug.
2. Raised food and water bowls are appreciated by cats with osteoarthritis affecting their cervical spine and/or forelimbs.
3. Moving water sources can encourage drinking in some cats.
4. Monitoring the size and number of urine clumps can be helpful in assessing success of strategies to encourage thirst in single cat households.
5. Assessing free catch urine specific gravity can help to monitor success of interventions. A USG of 1.030 to 1.035 is ideal.

REFERENCES

- Chetboul V, Reynolds BS, Trehou-Sechi E et al (2014). Cardiovascular effects of dietary salt intake in aged healthy cats: a 2 year prospective randomized, blinded, and controlled study. *PLoS One* 18;9(6):e97862
- Eisenberg BW, Waldrop JE, Allen SE et al (2013). Evaluation of risk factors associated with recurrent obstruction in cats treated medically for urethral obstruction. *J Am Vet Med Assoc.* 243:1140-6.
- Ellis SLH, Rodan I, Carney HC et al (2013). AAFP and ISFM Feline Environmental Needs Guidelines. *J Feline Med Surg* 15:219-230
- Grant DC (2010). Effect of water source on intake and urine concentration in healthy cats. *J Feline Med Surg* 12:431-4
- Gunn-Moore DA and Shenoy CM (2004). Oral glucosamine and the management of feline idiopathic cystitis. *J Feline Med Surg* 6:219-225
- Hawthorne AJ, Markwell PJ (2004). Dietary sodium promotes increased water intake and urine volume in cats. *J Nutr* 134:2128S-2129S.
- Kirk CA, Jewell DE, Lowry SR (2006). Effects of sodium chloride on selected parameters in cats. *Vet Ther* 7:333-46
- Pachel C and Neilson J (2010). Comparison of feline water consumption between still and flowing water sources: A pilot study. *J Vet Behav.* 5:130-133.
- Reynolds BS, Chetboul V, Nguyen P et al (2013). Effects of dietary salt intake on renal function: a 2-year study in healthy aged cats. *J Vet Intern Med* 27:507-15
- Zanghi BM, Gerheart L and Gardner CL (2018). Effects of a nutrient-enriched water on water intake and indices of hydration in healthy domestic cats fed a dry kibble diet. *Am J Vet Res* 79: 733-744