Moisture Matters: Understanding Chronic Dehydration in Cats

Q Why are cats susceptible to dehydration?
A There are multiple reasons why cats may not consume an ideal amount of water.

Evolution. Cats have evolved as obligate carnivores and don’t naturally drink water when eating fresh prey or wet food—both of which are about 60% to 70% water.

• When cats eat a dry diet, their thirst drive is reduced. And while cats on dry diets do drink more water than those on wet diets, the amount does not equal the water contained in a wet diet with the same nutrient composition.1

• Cats adjust their water intake to the dry matter content of their diet rather than the diet’s moisture content.2 When cats become dehydrated, they can be slow to initiate drinking compared to dogs, they take almost a day longer to replenish severe fluid deficits.3

Physiology and anatomy. Adult cats are not designed to be efficient drinkers of low-viscosity fluids such as water because they cannot create suction with their tongues.

• When they lap a bowl of water, only 3/100 of a teaspoon of water is consumed with each flick of the tongue. Consequently, a lot of lapping is required for a cat to stay hydrated.4

• While cats have excellent distance vision, they have poor near-distance vision. This can make it difficult for them to see the meniscus on the surface of their water bowl.

Instinctive behavior. Cats can feel vulnerable when drinking from a water bowl.

Preferences. Cats are sensitive to the presentation and taste of water and prefer fresh, moving water.

Q How does the form of the diet affect metabolic function in the cat?
A One way to study this is to compare hydration in cats that eat dry diets vs. cats that eat wet diets. A recent study showed that cats fed a wet diet containing 70% moisture had lower urine specific gravity and less weight gain while exhibiting more physical activity than cats fed a dry diet with 10% moisture.4 In addition, studies comparing water balance in cats have shown that cats fed a canned food had significantly greater water intake per gram of dry matter compared to cats fed a dry food.5

Q Not every owner—or cat—is willing to switch from dry food. Is feeding a combination of wet and dry food a viable alternative?
A Not really. Studies show that feeding diets with rations of 13 and 23 wet vs. dry food had no significant effects on urine volume or lean body mass, even though water volume increased.6 Feeding an all-canned diet or supplementing a dry diet with nutrient-enriched water are better strategies for cats that need to increase fluid intake.

Do Owners Know How Much Their Cats Are Drinking?
To better understand cat owners and what they know about the hydration needs of their cats, Purina® Pro Plan® Veterinary Supplements conducted a survey of 1,018 U.S. cat owners whose cats visited the veterinarian in the last 12 months.7

The findings...

Cat owners are more likely to assume their cat is drinking enough than to actually know how much they drink. While 79% of owners surveyed believe their cats drink enough water each day, only 37% claim to know how much water their cats need to drink daily.

Veterinarians have an opportunity to initiate hydration conversations. While the veterinarian is the most trusted source of information about cat health and care, just 31% of owners have discussed their cats’ hydration needs with their veterinarian, and 45% are unaware that dehydration might be related to a secondary health condition.
Because cats are prone to dehydration, ensuring adequate water intake can be a constant challenge for veterinarians and owners alike. While research has shown that both water intake per gram of dry matter and total water turnover per gram of dry matter increased when cats are switched from eating an all-dry to an all-wet diet, feeding canned food is not an option for every cat, due to both owner and pet preferences. For this reason, scientists at Purina investigated a new method to increase fluid intake: a nutrient-enriched water supplement.

**Water supplements for cats: Can they help?**

Studies were performed to evaluate nutrient-enriched water supplemented with osmolytes (e.g., amino acids and glycerol) to support the absorption of water. Drinking volumes, total water intake and various measures of hydration were all quantified in healthy cats.

- In the first study, indoor cats in home environments had ad libitum access to nutrient-enriched water for 56 days to examine sustained ingestion. The cats increased total daily water intake, resulting in more dilute urine and decreased urine osmolality.

- In the second study, indoor cats had free access to a specific dose of nutrient-enriched water offered twice daily, with the volume of liver flavor incrementally increased over a 10- to 17-day period. Cats consumed more liquid by drinking as the volume of liver flavor was increased. In addition, urine specific gravity decreased.

- The third study evaluated cats that were given brief access to 50 mL of nutrient-enriched water in a clinic setting to evaluate acute response to liquid ingestion as fluid therapy. The healthy cats in this study drank significantly more water when offered nutrient-enriched water than when offered tap water.

These studies demonstrate that cats not only drink more liquid but maintain a higher level of water intake when given access to nutrient-enriched water. In the study with the clinic cats, dose-specific increases in water intake translated into acute increases in hydration and prevented mild, subclinical dehydration. Because urine volume increased and urine specific gravity decreased in supplemented cats, these findings suggest that cats in need of greater hydration would benefit from a water supplement.

**Helping cats get the water they need**

Many situations exist in a cat's daily life that may leave it in a dehydrated state and in need of increased water intake. Recent studies in healthy cats given nutrient-enriched water begin to provide a greater understanding of how daily water ingestion impacts hydration and associated physiological parameters. As a result, veterinarians have the opportunity to move beyond the generic recommendation of merely telling clients to keep fresh water available and, instead, provide a product that can increase daily water intake and improve hydration.

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Dehydration is a common complication of chronic kidney disease (CKD) and can lead to inappetence, lethargy, weakness, constipation and increased susceptibility to uremic crisis. It may also precipitate pathophysiologic responses that have a negative effect on the kidneys.

**Dangers of dehydration**

Several physiologic mechanisms are triggered when the body senses dehydration, and chronic subclinical dehydration may result in compensatory effects that ultimately have a negative effect on the kidneys. These pathophysiologic effects include:

- **Release of vasopressin**, which works to increase water reabsorption via increased expression of aquaporin channels in the collecting duct. This can result in intraglomerular hypertension and potentially the development of proteinuria and systemic hypertension.

- **Activation of the ren-in-angiotensin-aldosterone system (RAAS)**, which is another critical component in the pathophysiology and progression of renal disease. Normally protective, the RAAS—which regulates blood pressure, fluid and electrolyte balance, and systemic vascular resistance—becomes maladaptive in patients with CKD.

- **Poor perfusion**, which may exacerbate hypoxia at the tissue level in kidneys that are already susceptible due to fibrosis and damaged vasculature.

Therapeutically addressing dehydration may benefit the kidneys by reducing vasopressin secretion, decreasing the activation of RAAS and optimizing perfusion.

**Rehydration strategies for cats with CKD**

The following strategies can help owners of CKD patients keep their cats appropriately hydrated.

1. **Educate clients about hydration.** Explain how to monitor cats for dehydration, including looking for concurrent illnesses, vomiting and diarrhea. Advise clients to eliminate household stresses that might inhibit their cats from drinking and to provide an adequate water supply. Ensure they understand that quick medical action may be required if they notice these signs, especially for older cats with CKD.

2. **Address water balance.** Recommend clients feed canned food instead of dry or add water to food, and provide fresh, accessible water to their cats. Supplementation with free water (orally or with a feeding tube) is preferred to avoid the excess sodium load that comes with subcutaneously administered electrolyte solutions.

3. **Assess for and treat constipation.** The cause of constipation associated with CKD is likely a dysfunction of water balance, so hydration should be dealt with before employing other medical therapies. Potassium deficiency should also be identified and addressed. Following this, oral osmotic stool softeners can help manage constipation. Adding fiber sources such as psyllium may also be useful.

Maintaining hydration is a key therapeutic target in kidney disease. By carefully assessing renal disease patients for hydration status, veterinarians can tailor therapy appropriately.

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**Key Takeaways**

- When dehydration is a concern for a cat, switching the diet to all-canned food or supplementing a dry diet with nutrient-enriched water are effective strategies for improving hydration.

- Studies demonstrated that cats given access to nutrient-enriched water not only drink more liquid, but maintain a higher level of water intake.

- Maintaining adequate hydration—while avoiding overhydration—is a key therapeutic goal for cats with CKD. Patients with renal disease should be carefully assessed for hydration status so therapy can be tailored appropriately.

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**Know the risks of overhydration**

While the most common water balance issue in patients with CKD is dehydration, overhydration can also be a concern. As kidneys become increasingly diseased, their ability to remove water from the body is compromised, making overhydration an added risk that can result in negative consequences.

Excessive hydration can result in clinically obvious signs such as third-spacing and can have detrimental effects at the level of the kidney parenchyma.

CKD patients with later-stage disease, acute kidney injury or underlying ureteral obstruction may not be able to excrete water the way a patient with normal kidney function would. Likewise, CKD patients who are used to being chronically subclinically dehydrated may also not adjust well to sudden administration of large volumes of fluid. Use caution when administering fluid therapy because fluid overload can be challenging to resolve without dialysis.
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