

# Diabetes Insipidus: The 'Other' Type of Diabetes

Diabetes mellitus or 'sugar diabetes' is the type of diabetes most of us are familiar with. But there's another form of the disease called diabetes insipidus, or 'water diabetes.'

**Analysis by [Dr. Karen Shaw Becker](#)**

## STORY AT-A-GLANCE

- Diabetes insipidus, often called the “other” type of diabetes, is different from the more common diabetes mellitus, though they share some symptoms
- Diabetes insipidus, or DI, is a metabolic disorder in which the kidneys aren't able to reabsorb normal amounts of water. That's why one of the chief symptoms of DI is the production of large quantities of very dilute urine
- There are two primary types of DI, central diabetes insipidus, and nephrogenic diabetes insipidus. There's also a less common third type called psychogenic diabetes insipidus
- Symptoms of DI besides excessive urination include extreme thirst with increased water intake, dehydration, electrolyte imbalance, house soiling, weight loss, poor coat condition and disorientation
- Treatment for a pet with DI will depend on its cause. Some forms of DI can be cured, while others will be with the animal for life. Caring for a pet with diabetes insipidus includes insuring the animal has access to fresh water at all times, as well as constant access to a potty spot

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Diabetes insipidus, or DI, is also referred to as water diabetes. The more common form of diabetes, diabetes mellitus, is known as sugar diabetes. The two conditions are actually very different, though they have some symptoms in common.

Diabetes mellitus is a disorder of sugar metabolism involving the hormone insulin. Diabetes insipidus is a metabolic disorder in which the kidneys aren't able to reabsorb normal amounts of water, so the dog or cat eliminates large quantities of very dilute urine. The word “insipid” describes this colorless, tasteless characteristic of the dilute urine.

DI is also called the “other type of diabetes.” There are two forms of DI: central diabetes insipidus and nephrogenic diabetes insipidus.

## Central Diabetes Insipidus

In central DI, called CDI, the hypothalamus in the brain and/or the connected pituitary gland doesn't release enough antidiuretic hormone. This hormone is called ADH and it's also known as vasopressin.

The job of ADH once it enters the bloodstream is to travel to the kidneys and bind to receptors on specialized cells. This action tells the kidneys to increase reabsorption of water rather than excreting it in urine, which produces the appropriately concentrated urine.

The hypothalamus mixes ADH, and the pituitary stores it. If either doesn't do its job, there's an ADH shortage. Pets with CDI don't produce enough ADH to signal the kidneys to perform their normal fluid regulation function.

Central DI is thought to be caused by a congenital defect, trauma, bacterial or viral infection, a pituitary cyst or tumor, or some other factor that causes the ADH-secreting tissues to degenerate and die.

## **Nephrogenic Diabetes Insipidus**

Nephrogenic diabetes insipidus or NDI is a much more rare form of diabetes than CDI. With this form of diabetes insipidus, there's an adequate amount of ADH being produced, but the kidneys don't respond to the hormone as they should. It could be that something interferes with the ability of ADH to bind to the receptors on the kidney cells. The outcome is the same as it is with an insufficient supply of ADH — the kidneys don't receive the signal to reabsorb more water.

It's thought the decreased binding ability of ADH could be caused by an endocrine or metabolic disorder such as Cushing's disease, hypercalcemia, high levels of aldosterone, or low levels of potassium. Sometimes potential toxins caused by E. coli bacteria, kidney disease, or an infection can also be contributing factors to NDI.

## **Psychogenic Diabetes Insipidus**

There's actually also a third type of diabetes insipidus caused by either a neurologic thirst-control disorder or a behavior problem that involves excessive water drinking. This form of the condition is caused by excessive water intake called polydipsia and excessive urination called polyuria. Veterinarians call this combination of polyuria and polydipsia PU/PD.

Psychogenic diabetes insipidus does not involve a primary problem with kidney or pituitary gland function.

## **Symptoms and Diagnosis**

Pets with congenital or nephrogenic diabetes insipidus are often diagnosed in their first year of life. Those with central diabetes insipidus are usually not diagnosed until middle age.

The most obvious symptoms of diabetes insipidus are passing abnormally large amounts of dilute urine and extreme thirst with increased water intake. Other symptoms can include dehydration, electrolyte imbalance, house soiling (with a house-trained pet), weight loss, poor coat condition, disorientation, loss of coordination, and in severe cases, stupor, seizures, tremors, and collapse.

Diagnosing diabetes insipidus is quite challenging, actually, and involves a lot of different tests. Blood tests, urinalysis, and a urine culture will all be necessary in part to rule out other causes for the symptoms, including diabetes mellitus, Cushing's, pyometra (a uterine infection in female dogs), hypothyroidism in kitties, and problems with either the kidneys, bladder, or liver.

Other tests can include measuring pituitary hormone levels, an MRI or CT scan to check for a mass on the pituitary gland, an abdominal ultrasound, as well as a water deprivation test to see if the animal can produce a more concentrated urine when water intake is restricted.

Sometimes veterinarians do a desmopressin stimulation test. Desmopressin is the drug used to treat DI. If an animal has a positive response to the drug, it's a good indicator the problem is truly diabetes insipidus.



*Jelly, one of Dr. Becker's diabetes insipidus patients*

## **Treating Pets With Diabetes Insipidus**

The treatment goal for pets with diabetes insipidus is to identify and resolve any underlying cause, and to correct the excessive water drinking and urination. In some cases, if increased water intake and urination is tolerable, and the pet's organ function and metabolic function are otherwise healthy, it's not always necessary to treat the condition.

Any pet that has diabetes insipidus must have free access to clean, fresh water at all times. Water must never be withheld from an animal dealing with this particular condition.

If the diagnosis is central DI, then a synthetic form of the hormone ADH can be given orally or more commonly as an eye drop. Supplementing ADH in pets with nephrogenic DI or psychogenic DI is useless, because the problem isn't low levels of this hormone in the first place.

A low sodium diet has been proven beneficial for some of these pets. Unless your pet's DI is acquired rather than congenital, and unless the condition can be resolved by treating an underlying problem, your dog or cat will have DI for the rest of his life.

## Caring for a Pet With DI

Important considerations for your DI pet are to keep plenty of fresh drinking water available 24 hours a day, and ensure your dog or cat has a convenient place to urinate whenever he needs to. A doggy door leading to a fenced backyard is often ideal for dogs with the condition.

Kitties with DI need two or three litter boxes that are scooped frequently every day and replenished with plenty of fresh litter. DI pets can become severely and life-threateningly dehydrated without constant access to water, so never limit water intake for any reason with these animals.

I think the biggest frustration for most owners prior to a diagnosis is the amazing amount of urine these pets can produce. Remember that most DI pets can't go for more than an hour or so without urinating, so there will be accidents. It's not your pet's fault, so don't blame her. She can't help it. It's important that you are prepared to do lots of cleanups with an enzyme-based cleaner, urine remover, or odor remover.

Most importantly, if your pet suddenly begins drinking and peeing excessively, visit your veterinarian to determine the medical reason for this behavior. In many instances, all the basic tests will come back normal, and it's only a positive response to treatment that ultimately confirms the diagnosis of central diabetes insipidus.

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