



**Ettinger: Textbook of Veterinary Internal
Medicine, 7th Edition**
Addison's Disease
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What is Addison's disease?

Addison's disease is a hormonal disorder named after Thomas Addison, a British scientist, who is credited for being the first person to demonstrate that adrenal glands are necessary for life. Dogs, cats, people, and other species have a pair of small glands located in the abdomen, one next to each kidney. In Latin, "kidney" is "renal" and "next to" is "ad." These small glands are therefore called the *adrenal* glands because of their location. They are so-named because they were recognized by anatomists long before their vital (life saving) function was understood.

The glands produce two substances that are critical for life:

1. Glucocorticoids
2. Mineralocorticoids

These substances are placed into the blood stream after they have been synthesized and circulate throughout the body. As such, they are classified as being hormones. Both these hormones have an effect on the function of cells everywhere in the body. To look at it another way, cells everywhere in the body need some glucocorticoids and some mineralocorticoids to be healthy. They suffer if there is too much or too little of either or both.

Glucocorticoids are natural cortisone. Cortisone is necessary for life and is important in ensuring that individuals feel well. Glucocorticoids have many functions, including an effect on appetite and immune system function. Doctors commonly use both natural and synthetic cortisones. Cortisone can be beneficial as a medical treatment for relatively minor problems (poison oak, for example) and for serious life-threatening medical disorders (some cancers, for example). If an individual chronically has too much or too little cortisone in his or her system, serious medical problems can result. Too little cortisone is one of two components of Addison's disease.

Mineralocorticoids are another vital substance produced by normal adrenal glands. Mineralocorticoids control two of the body's critically important "salt" concentrations: they control the levels of both sodium and potassium. As with glucocorticoids, too much mineralocorticoid in the system usually results in serious medical problems. Too little mineralocorticoid is a life-threatening condition. **Addison's disease occurs when the body contains too little glucocorticoids and too little mineralocorticoid.**

What causes Addison's disease?

The onset of Addison's disease is usually the result of some destructive process affecting both adrenal glands and the cells that produce both of these critically important hormones. The most common cause of Addison's disease is destruction of both adrenal glands by the individuals' own immune system. The immune system functions primarily by constantly being on the lookout for foreign objects and upon seeing something not recognized as "self," this system immediately tries to kill whatever that might be.

The best examples of foreign bodies that the immune system wants to kill are bacteria and viruses. For reasons that are not well understood, the immune system occasionally sees normal body parts as "foreign" and sets out to kill these tissues. In this uncommon instance, the immune system sees the adrenal glands as foreign and kills these cells.

Less common causes of Addison's disease are cancers or infections that can invade and kill the adrenal glands.

What are the symptoms of Addison's disease?

Addison's disease is relatively uncommon in dogs and is considered rare in cats. The disease is most common in young to middle-aged female dogs. The condition has been diagnosed in dogs and cats of all ages, either gender, and in both intact and neutered animals.

A few dogs seem predisposed to Addison's disease. These breeds include the following:

- Portuguese water dog
- Standard poodle
- Bearded collie

Addison's disease, however, can affect any breed and mixed breed dogs.

In general, the symptoms of Addison's disease seem to come on quickly, usually over what seems to be just a few days. It can develop over weeks or months as well. Most owners note that their pet develops several problems at about the same time.

In no particular order, these problems include the following:

- Loss of appetite
- Extreme lethargy
- Vomiting
- Diarrhea
- Weight loss
- Muscle weakness

Less common owner observations include weakness and loss of appetite that seems to come and go a few times before the symptoms persist. Some dogs have been observed

to shiver, tremble, or shake as if they are cold. Some dogs suddenly collapse and quickly seem to develop a shock-like condition.

What tests are needed?

Vomiting, diarrhea, loss of appetite, and weight loss are extremely nonspecific problems. These can be the symptoms of a dog or cat that has stomach, intestinal, heart, liver, or kidney disease. Other conditions can also cause these types of symptoms. To further complicate this issue, diseases of other organ systems are much more common than Addison's disease. Therefore your veterinarian may or may not suspect Addison's disease after talking with you and after completing a physical examination. It is most likely that your veterinarian will believe that your pet is ill and will recommend a battery of tests that will assess various organ systems simultaneously.

One of the hallmark abnormalities seen in dogs with Addison's disease is an increase in blood concentrations of potassium and decreases in blood concentrations of sodium. However, such changes are also nonspecific. Since your veterinarian suspected Addison's disease and because this is a condition that requires life-long therapy, a specific test for Addison's disease was recommended. This test, called the *ACTH stimulation test*, is the "gold standard" for diagnosing Addison's disease in people, dogs, and cats. If the result is typical of Addison's disease, your pet will require life-long treatment for survival.

What treatment is needed?

Long-term treatment of Addison's is not nearly as difficult as making or suspecting the diagnosis in the first place. Further, long-term treatment is not nearly as difficult as the intensive care required initially in the hospital that saved your dog's life. Once your dog is ready to be sent home, however, your role will be much less difficult. There are both glucocorticoids and mineralocorticoid replacement medications. The glucocorticoids used in the treatment of Addison's disease are not special in any way. Rather, these are the same medications used for a variety of conditions in both human and veterinary medicine. The only unique aspect regarding glucocorticoids replacement therapy for Addison's disease is the fact that affected pets require relatively tiny doses as compared with the doses used for pets with immune-mediated disease, cancer, or other conditions.

Two different mineralocorticoids are available. Both of these medications are specific for patients with Addison's disease. The pill form is commonly used in people with this disease and is effective at low doses. Dogs and cats seem relatively resistant to the pills, and, therefore, they may require relatively large doses. This, in turn, results in an expensive commitment. There is a once every 25-day injectable medication specifically made for dogs and cats. This drug is effective and is the recommended mineralocorticoid. Some dogs require injections once every 21 days and others can get by with one injection each month. Most, however, respond better with injections every 25 days. Owners can usually administer these injections. It may take 2 to 6 months to establish a dose. Once the current dose is established for your pet, it will remain relatively constant.

Conclusion

Addison's disease is a relatively uncommon syndrome. Dogs and cats correctly diagnosed and properly treated live healthy and happy lives. Although some significant expense is associated with the long-term care of affected pets, their treatment is almost always successful and rewarding.