Frequently-Asked Questions: Adrenal Function Testing

What is the best test for diagnosing hyperadrenocorticism?

The low dose dexamethasone suppression test is a good test for diagnosing hyperadrenocorticism in most cases. It is relatively inexpensive to perform, and tests the response of the pituitary and adrenal glands to negative feedback inhibition. In some cases, the low dose dexamethasone suppression test can also give insight as to whether the origin of hyperadrenocorticism is pituitary. As with any adrenal function test, both false positives and false negatives can occur, however. If there has been a history of exogenous steroid use, then the ACTH response test is a better choice for diagnosis.

What is the best test for diagnosing hypoadrenocorticism?

The ACTH response test is the test of choice for diagnosing hypoadrenocorticism (Addison's disease). Cortisol should be measured in the pre- and post-sample. Sometimes aldosterone measurement in the pre- and post-sample can also be useful.

How can I differentiate the origin of hyperadrenocorticism (pituitary or adrenal)?

Several tests can be used to help differentiate the origin of hyperadrenocorticism. Both the low dose dexamethasone suppression test and the high dose dexamethasone suppression test can be helpful in determining the presence of pituitary dependent hyperadrenocorticism. A measurement of endogenous ACTH can often distinguish between adrenal origin or pituitary origin. Adrenal tumors cause a suppression of endogenous ACTH secretion, and thus very low concentrations of circulating endogenous ACTH. In addition, visualization of the adrenal glands with abdominal ultrasound may be useful. With pituitary dependent hyperadrenocorticism we expect to see bilaterally enlarged adrenal glands, and with an adrenal tumor, usually one adrenal is enlarged with an irregular shape, and the other adrenal gland is small.

What is the purpose of the urinary cortisol to creatinine ratio (UCCR)?

The urinary cortisol to creatinine ratio is best used as a screening tool for the absence of hyperadrenocorticism. It is a simple and noninvasive test, where the owners collect a morning urine sample at home. If this test is negative, it is unlikely that hyperadrenocorticism is present. However, since stress or other nonadrenal illness can often result in a positive test, a positive UCCR indicates that hyperadrenocorticism is still a possibility and further testing (such as a low dose dexamethasone suppression test) should be performed.

If the UCCR is positive, does this mean that the dog has hyperadrenocorticism?

No. Stress or other nonadrenal illness can also result in a positive test. A positive UCCR indicates that hyperadrenocorticism is still a possibility and further testing (such as a low dose dexamethasone suppression test) should be performed.
If a dog has an elevated ALP, does it have hyperadrenocorticism?
An elevated ALP alone does not indicate the presence of hyperadrenocorticism, as this enzyme is nonspecific and can be elevated with stress or other nonadrenal illness. There should be other clinical signs of hyperadrenocorticism, and dynamic adrenal function testing (such as a low dose dexamethasone suppression test) should be performed.

What is the best test for monitoring treatment for hyperadrenocorticism?
This depends on the treatment. For most hyperadrenocorticism treatments, the ACTH response test should be performed to monitor therapy. However, if Anipryl (Deprenyl, selegiline) is being used, then clinical signs should be used for monitoring.

What test do I use to monitor trilostane therapy?
The ACTH response test should be used to monitor trilostane therapy. There is a useful chart with dosage and monitoring instructions at: http://www.vetoryl.com

What is the purpose of measuring endogenous ACTH?
In dogs, endogenous ACTH is usually measured to differentiate the origin of hyperadrenocorticism. It should only be measured once a diagnosis of hyperadrenocorticism is made. Endogenous ACTH concentration is not useful in the diagnosis of hyperadrenocorticism, only in differentiation. If an adrenal tumor is present, the concentration of endogenous ACTH is very low due to negative feedback inhibition of ACTH release. With pituitary-dependent hyperadrenocorticism, the endogenous ACTH concentration can be elevated, may be within ‘normal’ limits, or may even be a little below normal.

On occasion, endogenous ACTH is measured in cases of hypoadrenocorticism. In those cases, the endogenous ACTH concentration is typically very elevated in an attempt to stimulate cortisol secretion by the adrenal glands.

I suspected hypoadrenocorticism, but the ACTH response test was exaggerated. Does this dog have hyperadrenocorticism?
Not necessarily. Often dogs that have other nonadrenal illness can have an exaggerated ACTH response test. In these cases, the clinical signs of hyperadrenocorticism are not present.

A dog has a very elevated ALP, but no clinical signs. Should I test/treat for hyperadrenocorticism?
An elevated ALP alone is not a specific test for hyperadrenocorticism. Stress or other illness can result in an elevated ALP. If clinical signs of hyperadrenocorticism are present, then testing for hyperadrenocorticism is warranted.

I have a patient with uncontrolled diabetes mellitus and I want to test for hyperadrenocorticism. What test should I use?
Diagnosing hyperadrenocorticism can be very difficult in a dog that has uncontrolled diabetes mellitus. All adrenal function tests can give a false positive result when other nonadrenal illness is present. We typically recommend trying to get the best control of diabetes as possible, then perform a low dose
dexamethasone suppression test. Strong clinical signs of hyperadrenocorticism should be present before making a diagnosis of concurrent hyperadrenocorticism.

I suspect hypoadrenocorticism in a dog, but he has received steroids recently. What should I do?

Exogenous steroid use can cause suppression of the adrenal glands resulting in low cortisol values after ACTH stimulation that can mimic the presence of hypoadrenocorticism. In these cases it is best to perform an ACTH response test and measure both cortisol and aldosterone in both the pre- and post-samples. In hypoadrenocorticism we expect aldosterone concentrations to be low, and they are not suppressed by steroid administration.