

The Hormone Foundation's Patient Guide to Detection, Diagnosis, and Treatment of Primary Aldosteronism

Why were the Guidelines written?

This patient guide is based on Clinical Guidelines written to help physicians diagnose and treat patients with primary aldosteronism (PA). PA is a condition that results when one or both of your adrenal glands (small glands about the size of a prune located on top of the kidneys) produce too much of the hormone aldosterone. Having high levels of aldosterone causes your body to retain sodium (salt) and lose potassium. Sodium retention causes fluid build-up which then raises blood pressure.

In the past, it was assumed that PA was fairly rare, but recent evidence has now shown it occurs in as many as 10% (one in ten) patients with high blood pressure. PA is more common in people with severe, uncontrolled high blood pressure. People with PA are at greater risk of heart disease and stroke than are others with the same degree of high blood pressure but without PA. That's why its diagnosis and treatment are important.

How were the Guidelines developed?

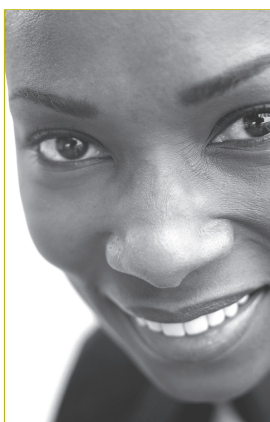
The Clinical Guidelines were developed after an extensive review of the best human research studies related to the diagnosis and treatment of PA. An expert panel of The Endocrine Society examined studies that were published in "peer-reviewed" medical journals (i.e., studies that were evaluated by other scientists). Once the panelists reached an agreement about their "recommendations" and "suggestions," the Guidelines were reviewed by the general membership of The Endocrine Society and approved by several of the Society's committees. The development of these Guidelines was not influenced by pharmaceutical or other business concerns.

Who should be tested for PA?

The Clinical Guidelines recommend that doctors test for PA in those patient groups known to be at high risk

of having PA. This includes patients with:

- moderate, severe, or resistant high blood pressure (*resistant* means that three medications administered at the same time fail to bring the blood pressure into the normal range)
- high blood pressure and a low level of potassium in the blood



Because people with PA are at a greater risk of heart disease and stroke, its diagnosis and treatment are critical.

- high blood pressure and an adrenal tumor (which may have been discovered when a computerized imaging study—e.g., CT scan or MRI scan—was done for other reasons)
- high blood pressure at a young age
- family history of stroke

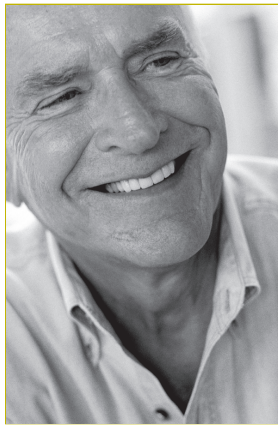
Patients with high blood pressure who have a parent, sibling, or child with PA should also be tested.



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How is PA diagnosed?

The Guidelines recommend use of the aldosterone/renin ratio (ARR) to detect cases of PA in these patient groups. To determine the ARR, your doctor will take blood samples to measure your levels of aldosterone and renin. Renin is a protein that is released by the kidneys to help regulate blood pressure. Diagnosis of PA is based on your having both very high levels of aldosterone and low levels of renin. If your ARR indicates PA, your doctor will perform other tests to confirm the diagnosis.



You and your doctor should be partners in your care. Discuss your treatment options and what you can expect from them.

Once the diagnosis of PA is confirmed, additional tests are used to determine whether the underlying cause of the excess aldosterone is a *benign* (noncancerous) tumor in one adrenal gland or if both adrenal glands are overactive. A CT scan of the adrenal glands is performed first to see if there is an obvious benign tumor. However, the CT alone may not identify the cause of the overproduction. Further testing may include adrenal venous sampling. In this test a blood sample is drawn from each of the adrenal glands through a catheter that is inserted into a vein in the groin. If the aldosterone level is high from one but not the other adrenal, that indicates a benign tumor on the side with the high aldosterone level. If the levels are high in both samples, that indicates overactivity in both glands.

How is PA treated?

Treatment of PA depends on the underlying cause. It is commonly caused by a benign tumor (*aldosterone-producing adenoma*) in an adrenal gland or by excessive growth of cells (*hyperplasia*) in one or both adrenals. In rare cases, it is caused by the inherited condition of *glucocorticoid-remediable aldosteronism* (GRA).

Aldosterone-producing adenoma: If only one of your adrenal glands is causing the overproduction of aldosterone, it can be surgically removed. This operation may permanently solve the problem of high blood pressure and low potassium. Some people continue to have high, but less severe, blood pressure after surgery, but it can be managed with medication.

Hyperplasia: If both of your adrenals are overactive, the Guidelines recommend medical treatment with a *mineralocorticoid receptor (MR) antagonist*, such as the drug spironolactone. MR antagonists block the action of aldosterone in your body. Likewise, for persons with only one diseased adrenal but who are unwilling or unable to undergo surgery, treatment with an MR antagonist is an alternative.

Glucocorticoid-Remediable Aldosteronism: For the rare patients with GRA, the recommended treatment is the lowest dose of a *glucocorticoid* (that is, a steroid such as dexamethasone or prednisone) that can normalize blood pressure and potassium levels in the blood.

What can you do to help your treatment process?

Treatment of high blood pressure is more effective when combined with a healthy lifestyle even if the cause is PA. In fact, diet and exercise are critical to long-term cardiovascular health. In patients with PA, it is especially important to reduce the amount of sodium in your diet. A diet that emphasizes fresh fruits and vegetables, whole grains, and low-fat dairy products can promote weight loss and help lower blood pressure. Regular exercise is another way to control weight and benefit your cardiovascular system (heart, lungs, and blood vessels). If you smoke, you should stop. Nicotine narrows your blood vessels and increases your heart rate, putting a strain on the heart. Both alcohol and caffeine can raise blood pressure, and alcohol can interfere with the effectiveness of some blood pressure medications. You should ask your doctor about how you should limit your intake of these substances.

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