

## Overview

### Useful For

Investigation using inferior vena cava specimen for:

- Primary aldosteronism (eg, adrenal adenoma/carcinoma and adrenal cortical hyperplasia)
- Secondary aldosteronism (renovascular disease, salt depletion, potassium loading, cardiac failure with ascites, pregnancy, Bartter syndrome)

### Special Instructions

- [Renin-Aldosterone Studies](#)
- [Steroid Pathways](#)

### Method Name

Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

### NY State Available

No

## Specimen

### Specimen Type

Plasma EDTA

### Specimen Required

**Patient Preparation:** The plasma renin activity (PRA) cannot be interpreted if the patient is being treated with spironolactone (Aldactone). Spironolactone should be discontinued for 4 to 6 weeks before testing.

**Collection Container/Tube:** Lavender top (EDTA)

**Submission Container/Tube:** Plastic vial

**Specimen Volume:** 1.6 mL

**Additional Information:** See [Renin-Aldosterone Studies](#) in Special Instructions for more detailed instructions.

### Specimen Minimum Volume

1 mL

### Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

### Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma EDTA	Frozen (preferred)	30 days	
	Refrigerated	28 days	
	Ambient	4 days	

## Clinical and Interpretive

### Clinical Information

Aldosterone stimulates sodium transport across cell membranes, particularly in the distal renal tubule where sodium is exchanged for hydrogen and potassium. Secondly, aldosterone is important in the maintenance of blood pressure and blood volume.

Aldosterone is the major mineralocorticoid and is produced by the adrenal cortex.

The renin-angiotensin system is the primary regulator of the synthesis and secretion of aldosterone. Likewise, increased concentrations of potassium in the plasma may directly stimulate adrenal production of the hormone. Under physiologic conditions, pituitary adrenocorticotrophic hormone is not a major factor in regulating aldosterone secretion.

See [Steroid Pathways](#) in Special Instructions.

### Reference Values

No established reference values.

### Interpretation

A high ratio of plasma aldosterone (PA) in ng/dL to plasma renin activity (PRA) in ng/mL per hour is a positive screening test result, a finding that warrants further testing. A PA:PRA ratio of 20 or greater is only interpretable with a PA of 15 ng/dL or greater and indicates probable primary aldosteronism.

Renal disease, such as unilateral renal artery stenosis, results in elevated renin and aldosterone levels. Renal venous catheterization may be helpful. A positive test is a renal venous renin ratio (affected/normal) above 1.5.

The following are available in Special Instructions:

-[Renin-Aldosterone Studies](#)

-[Steroid Pathways](#)

**Note:** Advice on stimulation or suppression tests is available from Mayo Clinic's Division of Endocrinology and may be obtained by calling 800-533-1710.

### Cautions

Late p.m. levels can be up to 30% lower than early a.m. levels. Supine values are on average 50% lower than upright collections. Sodium-depleted subjects have significantly elevated plasma aldosterone (PA) levels, potentially exceeding the upper limit of the salt replete upright reference range by several fold. To account for these variables, at least in part, it is recommended that plasma renin activity (PRA) is measured concomitantly. In situations of physiological variability, PRA should be altered in the same direction as aldosterone. See [Renin-Aldosterone Studies](#) in Special Instructions.

Angiotensin-converting enzyme (ACE) inhibitors have the potential to falsely elevate PRA. Therefore, in a patient treated with an ACE inhibitor, the finding of a detectable PRA level or a low PA:PRA ratio does not exclude the diagnosis of primary aldosteronism. In addition, in a patient taking an ACE inhibitor, an undetectably low PRA level is a strong predictor for primary aldosteronism.

### Clinical Reference

1. Young WF Jr: Primary aldosteronism: A common and curable form of hypertension. *Cardiol Rev* 1999;7:207-214
2. Young WF Jr: Pheochromocytoma and primary aldosteronism: diagnostic approaches. *Endocrinol Metab Clin North Am* 1997;26:801-827
3. Hurwitz S, Cohen RJ, Williams GH: Diurnal variation of aldosterone and plasma renin activity: timing relation to melatonin and cortisol and consistency after prolonged bed rest. *J Appl Physiol* 2004;96:1406-1414

### Performance

#### Method Description

Aldosterone-d6 is added to serum and plasma samples as an internal standard. Aldosterone and aldosterone-d6 are extracted from the specimens using a Strata X cartridge. The eluate is dried down under nitrogen, reconstituted with 70/30 methanol/H2O containing estriol and analyzed by liquid chromatography-tandem mass spectrometry using multiple reaction monitoring in the negative mode. (Fredline VF, Taylor PJ, Dodds HM, Johnson AG: A reference method for the analysis of aldosterone in blood by high-performance liquid chromatography-atmospheric pressure chemical ionization-tandem mass spectrometry. *Anal Biochem* 1997 Oct 15;252[2]:308-313)

#### PDF Report

No

#### Day(s) and Time(s) Test Performed

Monday through Friday; 4 p.m.

#### Analytic Time

2 days

#### Maximum Laboratory Time

5 days

#### Specimen Retention Time

14 days

#### Performing Laboratory Location

Rochester

### Fees and Codes

#### Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact [Customer Service](#).

#### Test Classification

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This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Code Information**

82088

**LOINC® Information**

Test ID	Test Order Name	Order LOINC Value
APIVC	Aldosterone, IVC, P	1763-2

Result ID	Test Result Name	Result LOINC Value
65425	Aldosterone, IVC, P	1763-2