MAYO CLINIC LABORATORIES

# Test Definition: ALDU

Aldosterone, 24 Hour, Urine

## Overview

### Useful For

Investigating primary aldosteronism (eg, adrenal adenoma/carcinoma and adrenal cortical hyperplasia) and secondary aldosteronism (renovascular disease, salt depletion, potassium loading, cardiac failure with ascites, pregnancy, Bartter syndrome) using 24-hour urine collections

### Special Instructions

- Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens
- Renin-Aldosterone Studies

### Method Name

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

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Ordering Guidance

Advice on stimulation or suppression tests is available from Mayo Clinic's Division of Endocrinology; call 800-533-1710.

### Necessary Information

**24-Hour volume (in milliliters) is required.**

### Specimen Required

**Patient Preparation:** Spironolactone (Aldactone) should be discontinued for 4 to 6 weeks before specimen collection. The plasma renin activity cannot be interpreted if the patient is being treated with spironolactone.
**Supplies:** Urine tubes, 10 mL (T068)
**Container/Tube:** Plastic, urine tube
**Specimen Volume:** 10 mL
**Collection Instructions:**
1. Add 25 mL of 50% acetic acid as preservative **at start of collection**. Use 15 mL of 50% acetic acid for children under the age of 5 years. This preservative is intended to achieve a pH of between approximately 2 and 4.
2. Collect urine for a full 24 hours (required) and record the total volume.
**Additional Information:** See Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens for multiple collections.

### Urine Preservative Collection Options

**Note:** The addition of preservative must occur prior to beginning the collection.

| | |
|---|---|
| Ambient (no additive) | No |
| Refrigerate (no additive) | No |
| Frozen (no additive) | No |
| 50% Acetic Acid | Preferred |
| Boric Acid | OK |
| Diazolidinyl Urea | No |
| 6M Hydrochloric Acid | No |
| 6M Nitric Acid | No |
| Sodium Carbonate | No |
| Thymol | No |
| Toluene | No |

### Specimen Minimum Volume

1 mL

### Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

### Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Urine | Refrigerated (preferred) | 28 days | |
| | Ambient | 14 days | |
| | Frozen | 28 days | |

## Clinical & Interpretive

### Clinical Information

Aldosterone stimulates sodium transport across cell membranes, particularly in the distal renal tubule where sodium is exchanged for hydrogen and potassium. Secondarily, 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 adrenocorticotropic hormone can stimulate aldosterone secretion.

Urinary aldosterone levels are inversely correlated with urinary sodium excretion. Normal individuals will show a suppression of urinary aldosterone with adequate sodium repletion.

Primary hyperaldosteronism, which may be caused by aldosterone-secreting adrenal adenoma/carcinomas or adrenal cortical hyperplasia, is characterized by hypertension accompanied by increased aldosterone levels, hypernatremia, and hypokalemia. Secondary hyperaldosteronism (eg, in response to renovascular disease, salt depletion, potassium loading, cardiac failure with ascites, pregnancy, Bartter's syndrome) is characterized by increased aldosterone levels and increased plasma rennin activity.

### Reference Values

0-30 days: 0.7-11.0 mcg/24 h*
31 days-11 months: 0.7-22.0 mcg/24 h*
> or =1 year: 2.0-20.0 mcg/24 h

*Loeuille GA, Racadot A, Vasseur P, Vandewalle B. Blood and urinary aldosterone levels in normal neonates, infants and children. Pediatrie. 1981;36(5):335-344

For International System of Units (SI) conversion for Reference Values, see
www.mayocliniclabs.com/order-tests/si-unit-conversion.html

### Interpretation

Urinary aldosterone excretion greater than 12 mcg/24 hours as part of an aldosterone suppression test is consistent with hyperaldosteronism.

For more information see Renin-Aldosterone Studies.

### Cautions

Angiotensin converting enzyme (ACE) inhibitors have the potential to "falsely elevate" plasma renin activity (PRA). Therefore, in a patient treated with an ACE-inhibitor, the findings of a detectable PRA level or a low sodium aldosterone (SA)/PRA ratio do not exclude the diagnosis of primary aldosteronism. In addition, a strong predictor for primary aldosteronism is a PRA level undetectably low in a patient taking an ACE-inhibitor.

### Clinical Reference

1. Young WF Jr. Primary aldosteronism: a common and curable form of hypertension. Cardiol Rev. 1999;7(4):207-214
2. Young WF Jr. Pheochromocytoma and primary aldosteronism: diagnostic approaches. Endocrinol Metab Clin North Am. 1997;26(4):801-827
3. 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. Analytical Biochem. 1997;252(2):308-313
4. Carey RM, Padia SH. Primary mineralocorticoid excess disorders and hypertension. In: Jameson JL, De Groot LJ, de Kretser DM, Giudice LC, et al, eds. Endocrinology: Adult and Pediatric. 7th ed. WB Saunders; 2016:1871-1891

## Performance

### Method Description

Samples are spiked with deuterated internal standard and are hydrolyzed overnight with acid. Samples are then

neutralized and extracted by solid phase extraction. The extracts are dried, reconstituted, and analyzed by liquid chromatography tandem mass spectrometry.(Taylor RL, Singh RJ. Validation of liquid chromatography-tandem mass spectrometry method for analysis of urinary conjugated metanephrine and normetanephrine for screening of pheochromocytoma. Clin Chem. 2002;48[3]:533-539; Wurth R, Tirosh A, Kamilaris CDC, et al. Volumetric modeling of adrenal gland size in primary bilateral macronodular adrenocortical hyperplasia. J Endocr Soc. 2020;5(1):bvaa162)

### PDF Report
No

### Day(s) Performed
Tuesday, Thursday

### Report Available
2 to 8 days

### Specimen Retention Time
14 days

### Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

## Fees & 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 account representative. For assistance, contact Customer Service.

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

### CPT Code Information
82088

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| ALDU | Aldosterone, U | 1765-7 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| 8556 | Aldosterone, U | 1765-7 |
| TM47 | Collection Duration (h) | 13362-9 |
| VL45 | Volume (mL) | 3167-4 |