Test Definition: ALDNA

Aldosterone with Sodium, 24 Hour, Urine

Overview

Useful For

Investigating primary aldosteronism (eg, adrenal adenoma/carcinoma and adrenal cortical hyperplasia) and secondary aldosteronism (eg, renovascular disease, salt depletion, potassium loading, cardiac failure with ascites, pregnancy, Bartter syndrome) in conjunction with urine sodium levels

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
ALDU	Aldosterone, U	Yes	Yes
NAU	Sodium, 24 HR, U	Yes	Yes

Special Instructions

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

Method Name

ALDU: Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)
NAU: Potentiometric, Indirect Ion-Selective Electrode (ISE)

NY State Available

Yes

Specimen

Specimen Type

Urine

Necessary Information

24-Hour volume (in milliliters) is required.

Specimen Required

Patient Preparation: Spironolactone (Aldactone) should be discontinued for 4 to 6 weeks before testing. The plasma renin activity cannot be interpreted if the patient is being treated with spironolactone.
Supplies: Sarstedt Aliquot Tube 5mL (T914)
Container/Tube: 2 Plastic, 5-mL tubes
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.
3. Place 5 mL of well mixed, 24-hour urine in plastic, 5-mL tube and label as Aldosterone.
4. Place 5 mL of well mixed, 24-hour urine in plastic, 5-mL tube and label as Sodium.

Additional Information: See Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens for multiple collections.

Forms

If not ordering electronically, complete, print, and send a Renal Diagnostics Test Request (T830) with the specimen.

Urine Preservative Collection Options

Note: Preservative must be added before beginning 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
Toluene	No

Specimen Minimum Volume

2 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)	14 days	
	Ambient	7 days	
	Frozen	14 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 syndrome) is characterized by increased aldosterone levels and increased plasma rennin activity.

Reference Values

ALDOSTERONE
0-30 days: 0.7-11.0 mcg/24 h*
1-11 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

SODIUM
41-227 mmol/24 h
If the 24-hour urinary sodium excretion is greater than 200 mmol, the urinary aldosterone excretion should be less than10 mcg.

Interpretation

Under normal circumstances, if the 24-hour urinary sodium excretion is greater than 200 mmol, the urinary aldosterone excretion should be less than 10 mcg/24 hours.

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

Twenty-four-hour urinary sodium excretion should exceed 200 mmol to document adequate sodium repletion.

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/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. Anal 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

Sodium:
The ion selective electron (ISE) module indirectly measures the electromotive force (EMF) difference between an ISE and a reference electrode. The EMF of the ISE is dependent on the ion concentration of the sample. The EMF of the reference electrode is constant. An electronic calculation circuit converts EMF of the sample to the ion concentration of the sample.(Package insert: ISE indirect Na, K, Cl for Gen 2. Roche Diagnostics; V14.0, 02/2018)

Aldosterone:
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

See Individual Unit Codes

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-Aldosterone
84300-Sodium

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
ALDNA	Aldosterone with Sodium, Urine	94871-1

Result ID	Test Result Name	Result LOINC® Value
8556	Aldosterone, U	1765-7
TM47	Collection Duration (h)	13362-9
VL45	Volume (mL)	3167-4
NA_24	Sodium, 24 HR, U	2956-1
TM11	Collection Duration	13362-9
VL9	Urine Volume	3167-4
NACN	Sodium Concentration	21525-1