Test Definition: RAMBO

Ammonium, Random, Urine

Overview

Useful For

Diagnosis of the cause of acidosis using random urine specimens

Diagnosis and treatment of kidney stones

Method Name

Enzymatic

NY State Available

Yes

Specimen

Specimen Type

Urine

Specimen Required

Supplies: Sarstedt 5 mL Aliquot Tube (T914)
Container/Tube: Plastic tube
Specimen Volume: 4 mL
Collection Instructions:
1. Collect a random urine specimen.
2. No preservative.

Forms

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

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)	14 days	
	Ambient	72 hours	
	Frozen	14 days	

Clinical & Interpretive

Clinical Information

The kidney regulates acid excretion and systemic acid base balance. Changing the amount of ammonium in the urine is one important way the kidneys accomplish this task. Thus, measuring the urine ammonium level can provide understanding of the cause of an acid base disturbance in individual patients.(1-3)

The urine ammonium level can also provide a lot of information about the daily acid production in a given patient. Since most of an individual's acid load comes from ingested protein, the urine ammonium is a good indicator of dietary protein intake.

Urine ammonium measurements can be particularly helpful for the diagnosis and treatment of kidney stone patients:
-High urine ammonium and low urinary pH suggests ongoing gastrointestinal losses. Such patients are at risk of uric acid and calcium oxalate stones.
-Low urine ammonium and high urine pH suggests renal tubular acidosis. Such patients are at risk of calcium phosphate stones.
-Patients with calcium oxalate and calcium phosphate stones are often treated with citrate to raise the urine citrate (a natural inhibitor of calcium oxalate and calcium phosphate crystal growth). However, citrate is metabolized to bicarbonate (a base), which can increase the urine pH. If the urine pH gets too high, the risk of calcium phosphate stones may have unintentionally been increased. Monitoring the urine ammonium concentration is one way to titrate the citrate dose and avoid this problem. A good starting citrate dose is about one-half of the urine ammonium excretion (in mEq of each). One can monitor the effect of this dose on urine ammonium, citrate, and pH values, and adjust the citrate dose based upon the response. A fall in urine ammonium should indicate whether the current citrate is enough to partially (but not completely) counteract the daily acid load of that given patient.(4)

Reference Values

Random: 3-65 mmol/L
No reference values established for <18 years and >77 years of age.

Interpretation

If a patient has acidosis and the amount of ammonium in the urine is low, this is suggestive of a renal tubular acidosis.

If the amount of ammonium is high, this suggests that the kidneys are working normally and that there are other losses of bicarbonate in the body. Typically this implies gastrointestinal losses.

Cautions

The presence of sulfasalazine, sulfapyridine, or temozolomide may lead to false results.

Ammonium concentrations may be falsely low in samples with a pH above 8.0. Consider contamination and/or a urinary tract infection with a urease positive organism (including *Ureaplasma urealyticum).*

Clinical Reference

1. Peonides A, Levin B, Young W: The renal excretion of hydrogen ions in infants and children. Arch Dis Child. 1965 Feb;40(209):33-39
2. Kamel KS, Briceno LF, Sanchez MI, et al: A new classification for renal defects in net acid excretion. Am J Kidney Dis.

1997 Jan;29(1):136-146
3. Madison LL, Seldin DW: Ammonia excretion and renal enzymatic adaptation in human subjects, as disclosed by administration of precursor amino acids. J Clin Invest 1958. Nov;37(11):1615-1627
4. Coe FL, Evan A, Worcester E: Pathophysiology-Based Treatment of Idiopathic Calcium Kidney Stones. Clin J Am Soc Nephrol. 2011 Aug;6(8):2083-2092

Performance

Method Description
Urine samples diluted 1:100 with clinical laboratory reagent water using a liquid handler are analyzed on a Roche Cobas 6000 c501 using Roche Diagnostics NH3L kit.(Package insert: Roche NH3L kit. Roche Diagnostics; V10/2016)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day to 2 days

Specimen Retention Time
7 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

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 has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
82140

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LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
RAMBO	Ammonium, Random, U	1842-4

Result ID	Test Result Name	Result LOINC® Value
RAMBO	Ammonium, Random, U	1842-4