MAYO CLINIC LABORATORIES

Test Definition: CALU

Calcium, 24 Hour, Urine

Overview

Useful For

Evaluation of calcium oxalate and calcium phosphate kidney stone risk, and calculation of urinary supersaturation

Evaluation of bone diseases, including osteoporosis and osteomalacia

Special Instructions

- Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens

Method Name

Photometric

NY State Available

Yes

Specimen

Specimen Type

Urine

Necessary Information

24-Hour volume (in milliliters) and collection duration are required.

Specimen Required

Patient Preparation: Patient **should not** use a laxative during the 24-hour collection period.
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: 24-hour graduated urine container with no metal cap or glued insert
Submission Container/Tube: Plastic, 5 mL tube or a clean, plastic aliquot container with no metal cap or glued insert
Specimen Volume: 4 mL
Collection Instructions:
1. Collect urine for 24 hours.
2. Refrigerate specimen within 4 hours of completion of 24-hour collection.
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: The addition of preservative or application of temperature controls **must occur within 4 hours of completion** of

the collection.

Ambient (no additive)	OK
Refrigerate (no additive)	Preferred
Frozen (no additive)	OK
50% Acetic Acid	OK
Boric Acid	OK
Diazolidinyl Urea	OK
6M Hydrochloric Acid	OK
6M Nitric Acid	No
Sodium Carbonate	No
Thymol	OK
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)	14 days	
	Ambient	72 hours	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Calcium is the fifth most common element in the body. It is a fundamental element necessary to form electrical gradients across membranes, an essential cofactor for many enzymes, and the main constituent in bone. Under normal physiological conditions, the concentration of calcium in serum and in cells is tightly controlled. Calcium is excreted in both urine and feces. Ordinarily about 20% to 25% of dietary calcium is absorbed and 98% of filtered calcium is reabsorbed in the kidney. Traffic of calcium between the gastrointestinal tract, bone, and kidney is tightly controlled by a complex regulatory system that includes vitamin D and parathyroid hormone. Sufficient bioavailable calcium is essential for bone health. Excessive excretion of calcium in the urine is a common contributor to kidney stone risk.

Reference Values

Males: <250 mg/24 h*

Females: <200 mg/24 h*

*Values represent clinical cutoffs above which studies have demonstrated increased risk of kidney stone formation. These values were not determined in a reference range study.

Reference values have not been established for patients who are younger than 18 years.

Reference values apply to 24-hour collection.

Interpretation

Increased urinary calcium excretion (hypercalciuria) is a known contributor to kidney stone disease and osteoporosis. Many cases are genetic (often termed idiopathic). Previously such patients were often divided into fasting versus absorptive hypercalciuria depending on the level of urine calcium in a fasting versus fed state, but the clinical utility of this approach is now in question. Overall, the risk of stone disease appears increased when 24-hour urine calcium is above 250 mg in men and above 200 mg in women. Thiazide diuretics are often used to reduce urinary calcium excretion. Repeat urine collections can be performed to monitor the effectiveness of therapy.

Known secondary causes of hypercalciuria include hyperparathyroidism, Paget disease, prolonged immobilization, vitamin D intoxication, and diseases that destroy bone (such as metastatic cancer or multiple myeloma).

Urine calcium excretion can be used to gauge the adequacy of calcium and vitamin D supplementation, for example in states of gastrointestinal fat malabsorption that are associated with decreased bone mineralization (osteomalacia).

Cautions

The interference of intravenously administered gadolinium-containing MRI (magnetic resonance imaging) contrast media was tested (Omniscan, Optimark). For Omniscan, no interference was observed at the therapeutic concentration, but there was interference at higher concentrations. For Optimark, interference was observed at therapeutic and higher concentrations

Clinical Reference

1. Fraser WD: Bone and mineral metabolism. In: Rifai N, Horvath AR, Wittwer CT, eds: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:1438
2. Curhan GC, Willett WC, Speizer FE, Stampfer MJ. Twenty-four-hour urine chemistries and the risk of kidney stones among women and men. Kidney Int. 2001;59(6):2290-2298
3. Metz MP. Determining urinary calcium/creatinine cut-offs for the pediatric population using published data. Ann Clin Biochem. 2006;43(Pt 5):398-401
4. Pak CY, Britton F, Peterson R, et al. Ambulatory evaluation of nephrolithiasis. Classification, clinical presentation and diagnostic criteria. Am J Med. 1980;69(1):19-30
5. Pak CY, Kaplan R, Bone H, Townsend J, Waters O. A simple test for the diagnosis of absorptive, resorptive and renal hypercalciurias. N Engl J Med. 1975;292(10):497-500

Performance

Method Description

Calcium ions react with 5-nitro-5'-methyl-BAPTA (NM-BAPTA) under alkaline conditions to form a complex. This complex reacts in the second step with EDTA. The change in absorbance is directly proportional to the calcium concentration and is measured photometrically.(Package insert: Roche CA2 kit. Roche Diagnostics; V9.0, 09/2023)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 to 3 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 cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
82340

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CALU	Calcium, 24 HR, U	6874-2

Result ID	Test Result Name	Result LOINC® Value
CA24	Calcium, 24 HR, U	6874-2
TM114	Collection Duration	13362-9
VL110	Urine Volume	3167-4