Test Definition: CALC5

Calcium, Random, Urine (Non-Orderable)

Overview

Useful For

Only orderable as part of a profile. For more information see CACR3 / Calcium/Creatinine Ratio, Random, Urine

Measurement of calcium for the evaluation of calcium oxalate and calcium phosphate kidney stone risk, and calculation of urinary supersaturations

Evaluation of bone diseases, including osteoporosis and osteomalacia

Method Name

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Photometric

NY State Available

Yes

Specimen

Specimen Type

Urine

Specimen Required

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Supplies: Sarstedt Aliquot Tube 5 mL (T914)
Collection Container/Tube: Clean, plastic 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 a random urine specimen.
2. No preservative.

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 physiologic 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

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1 month-<12 months: 0.03-0.81 mg/mg creatinine
12 months-<24 months: 0.03-0.56 mg/mg creatinine
24 months-<3 years: 0.02-0.50 mg/mg creatinine
3 years-<5 years: 0.02-0.41 mg/mg creatinine
5 years-<7 years: 0.01-0.30 mg/mg creatinine
7 years-<10 years: 0.01-0.25 mg/mg creatinine
10 years-<18 years: 0.01-0.24 mg/mg creatinine
18 years-83 years: 0.05-0.27 mg/mg creatinine
Reference values have not been established for patients who are younger than 1 month of age.
Reference values have not been established for patients who are older than 83 years of age.

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 greater than 250 mg in men and greater than 200 mg in women. Thiazide diuretics are often used to reduce urinary calcium excretion and 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

No significant cautionary statements.

Clinical Reference

1. Fraser WD: Bone and mineral metabolism. In: Rifai N, Horwath 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, et al, 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: CA2 reagent. Roche Diagnostics; 08/2023)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

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.

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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

82310

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CALC5	Calcium, Random, U	17862-4

Result ID	Test Result Name	Result LOINC® Value
CALC5	Calcium, Random, U	17862-4