Overview

Useful For
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
Photometric, NM-BAPTA Reaction

NY State Available
Yes

Specimen

Specimen Type
Urine

Specimen Required
Collection Container/Tube: Plastic urine container

Submission Container/Tube: Plastic, 5-mL tube (T465) 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.

Specimen Minimum Volume
1 mL

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

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Urine</td>
<td>Refrigerated (preferred)</td>
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<tr>
<td></td>
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<td>14 days</td>
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<tr>
<td></td>
<td>Ambient</td>
<td>72 hours</td>
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Clinical and 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
Random Calcium/Creatinine Ratio: <0.20 mg/mg

Reference values have not been established for patients <18 years and >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 >250 mg in men and >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
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, Indianapolis, IN, V2 2012)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Sunday; Continuously

Analytic Time
Same day/1 day

Maximum Laboratory Time
3 days

Specimen Retention Time
7 days

Performing Laboratory Location
Rochester

Fees and 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 Regional Manager. 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.

CPT Code Information
82310

LOINC® Information

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<td>Calcium, Random, U</td>
<td>17862-4</td>
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