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MAYO CLINIC LABORATORIES

Test Definition: CATN

Calcitonin, Serum

Overview

Useful For

Aids in the diagnosis and follow-up of medullary thyroid carcinoma

Aids in the evaluation of multiple endocrine neoplasia type II and familial medullary thyroid carcinoma

This test is **not useful for** evaluating calcium metabolic diseases.

Method Name

Electrochemiluminescence Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Patient Preparation: For 12 hours before specimen collection, patient should not take multivitamins or dietary supplements (eg, hair, skin, and nail supplements) containing biotin (vitamin B7).
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions:
1. After collection, immediately place specimen on ice.
2. Refrigerate specimen during centrifugation and immediately transfer serum to a plastic vial.

Forms

If not ordering electronically, complete, print, and send an Oncology Test Request (T729) with the specimen.

Specimen Minimum Volume

0.75 mL

Reject Due To

Gross	Reject

hemolysis	
Gross lipemia	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Frozen (preferred)	90 days	
	Ambient	8 hours	
	Refrigerated	24 hours	

Clinical & Interpretive

Clinical Information

Calcitonin is a polypeptide hormone secreted by the parafollicular cells (also referred to as calcitonin cells or C cells) of the thyroid gland. The main action of calcitonin is the inhibition of bone resorption by regulating the number and activity of osteoclasts. Calcitonin is secreted in direct response to serum hypercalcemia and may prevent large oscillations in serum calcium levels and excessive loss of body calcium. However, in comparison to parathyroid hormone and 1,25-dihydroxyvitamin D, the role of calcitonin in the regulation of serum calcium in humans is minor. Measurements of serum calcitonin levels are, therefore, not useful in the diagnosis of disorders of calcium homeostasis.

Malignant tumors arising from thyroid C cells (medullary thyroid carcinoma: MTC) usually produce elevated levels of calcitonin. MTC is an uncommon malignant thyroid tumor, comprising less than 5% of all thyroid malignancies. Approximately 25% of these are familial cases, usually appearing as a component of multiple endocrine neoplasia type II (MENII, Sipple syndrome). MTC may also occur in families without other associated endocrine dysfunction, with similar autosomal dominant transmission as MENII, which is then called familial medullary thyroid carcinoma (FMTC). Variants in the *RET* proto-oncogene are associated with MENII and FMTC.

Serum calcitonin concentrations are high in infants, decline rapidly, and are relatively stable from childhood through adulthood. In general, calcitonin serum concentrations are higher in men than in women due to the larger C-cell mass in men. Serum calcitonin concentrations may be increased in patients with chronic kidney failure, and other conditions such as hyperparathyroidism, leukemic and myeloproliferative disorders, Zollinger-Ellison syndrome, autoimmune thyroiditis, small cell and large cell lung cancers, breast and prostate cancer, mastocytosis, and various neuroendocrine tumors, in particular, islet cell tumors.

Reference Values

Pediatric
1 month: < or =34 pg/mL
2 months: < or =31 pg/mL
3 months: < or =28 pg/mL
4 months: < or =26 pg/mL
5 months: < or =24 pg/mL
6 months: < or =22 pg/mL
7 months: < or =20 pg/mL
8 months: < or =19.0 pg/mL

9 months: < or =17.0 pg/mL
10 months: < or =16.0 pg/mL
11 months: < or =15.0 pg/mL
12-14 months: < or =14.0 pg/mL
15-17 months: < or =12.0 pg/mL
18-20 months: < or =10.0 pg/mL
21-23 months: < or =9.0 pg/mL
2 years: < or =8.0 pg/mL
3-9 years: < or =7.0 pg/mL
10-15 years: < or =6.0 pg/mL
16 years: < or =5.0 pg/mL

Adults
17 years and older:
Males: < or =14.3 pg/mL
Females: < or =7.6 pg/mL

For International System of Units (SI) conversion for Reference Values, see www.mayocliniclabs.com/order-tests/si-unit-conversion.html.

Interpretation

Although most patients with sporadic medullary thyroid carcinoma (MTC) have high basal serum calcitonin concentrations, 30% of those with familial MTC or multiple endocrine neoplasia type II have normal basal levels.

In completely cured cases following surgical therapy for MTC, serum calcitonin levels fall into the undetectable range over a variable period of several weeks. Persistently elevated postoperative serum calcitonin levels usually indicate incomplete cure. The reasons for this can be locoregional lymph node spread or distant metastases. In most of these cases, imaging procedures are required for further workup. Those individuals who are then found to suffer only locoregional spread may benefit from additional surgical procedures. However, the survival benefits derived from such approaches are still debated.

A rise in previously undetectable or very low postoperative serum calcitonin levels is highly suggestive of disease recurrence or spread and should trigger further diagnostic evaluations.

Cautions

Falsely elevated values may occur in serum from patients who have developed human antimouse antibodies or heterophilic antibodies.

In rare cases, interference due to extremely high titers of antibodies to analyte-specific antibodies, streptavidin, or ruthenium can occur.

Values obtained with different assay methods or kits may be different and cannot be used interchangeably. Test results cannot be interpreted as absolute evidence for the presence or absence of malignant disease.

Clinical Reference

1. Wells SA Jr, Asa SL, Dralle H, et al. Revised American Thyroid Association guidelines for the management of medullary

thyroid carcinoma. Thyroid. 2015;25(6):567-610
2. Griebeler ML, Gharib H, Thompson GB. Medullary thyroid carcinoma. Endocr Pract. 2013;19(4):703-711
3. Richards ML. Familial syndromes associated with thyroid cancer in the era of personalized medicine. Thyroid. 2010;20(7):707-713

Performance

Method Description
Testing is performed on the Roche Cobas. The Roche human calcitonin (hCT) assay is a sandwich electrochemiluminescence immunoassay that employs a biotinylated monoclonal hCT-specific antibody and a monoclonal hCT-specific antibody. Calcitonin in the specimen reacts with both the biotinylated monoclonal hCT-specific antibody and the monoclonal hCT-specific antibody labeled with a ruthenium complex, forming a sandwich complex. Streptavidin-coated microparticles are added and the mixture is aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode. Unbound substances are then removed with ProCell. Application of voltage to the electrode induces the chemiluminescent emission, which is then measured.(Package insert: Elecsys Calcitonin. Roche Diagnostics; V 2.0, 12/2021)

PDF Report
No

Day(s) Performed
Monday through Saturday

Report Available
1 to 3 days

Specimen Retention Time
2 weeks

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 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

82308

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CATN	Calcitonin, S	1992-7

Result ID	Test Result Name	Result LOINC® Value
CATN	Calcitonin, S	1992-7