Test Definition: TRPS

Troponin T, 5th Generation, Plasma

Overview

Useful For

Aiding in the exclusion of the diagnosis of acute coronary syndrome in a single plasma specimen

Aiding in the diagnosis of acute coronary syndrome

Monitoring acute coronary syndromes and estimating prognosis

Possible utility in monitoring patients with nonischemic causes of cardiac injury

Method Name

Electrochemiluminescent Immunoassay (ECLIA)

NY State Available

Yes

Specimen

Specimen Type

Plasma Li Heparin

Specimen Required

Collection Container/Tube:

Preferred: Light-green top (lithium heparin gel)

Acceptable: Green top (lithium heparin)

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL Plasma

Collection Instructions:

1. Within 2 hours of collection, lithium heparin gel tubes should be centrifuged.
2. Within 2 hours of collection, lithium heparin tubes should be centrifuged, and the plasma aliquoted into a plastic vial .

Forms

If not ordering electronically, complete, print, and send a Cardiovascular Test Request Form (T724) with the specimen.

Specimen Minimum Volume

Plasma: 0.5 mL

Reject Due To

Gross hemolysis	Reject

Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Li Heparin	Frozen (preferred)	365 days	
	Ambient	24 hours	
	Refrigerated	24 hours	

Clinical & Interpretive

Clinical Information

Troponin T is a myofibrillar protein found in striated musculature. There are 2 types of myofilament: a thick filament containing myosin and a thin filament consisting of 3 different proteins, namely actin, tropomyosin, and troponin. Troponin is itself a complex of 3 protein subunits, which are termed troponin T, troponin I, and troponin C:
-Troponin T binds the troponin complex to tropomyosin
-Troponin I inhibits actomyosin ATPase in relation to the calcium concentration
-Troponin C has 4 binding sites for calcium and mediates calcium dependency

Troponin T is found in free cytosol and structurally bound protein. The unbound pool of troponin T is the source of early protein release in myocardial damage. Troponin T is released from the structural elements at a later stage, corresponding to the degradation of myofibrils that occurs in irreversible myocardial damage. Troponin T becomes elevated 2 to 4 hours after the onset of myocardial necrosis and can remain elevated for up to 14 days, or even longer on occasion.

The most common cause of cardiac injury is myocardial ischemia (ie, acute myocardial infarction). These patients are known to have an adverse short- and long-term prognosis compared to patients with unstable angina and no elevation of troponin T. Many of these patients, especially those with troponin T elevations above 30 ng/L, benefit from an aggressive strategy with anticoagulation and an invasive interventional strategy.

Reference Values

Males: < or =15 ng/L
Females: < or =10 ng/L

Interpretation

Values for healthy adults, based upon available literature and clinical guidelines, are 10 ng/L or less for women and 15 ng/L or less for men.

For patients who present with suspected acute coronary syndromes, troponin T values greater than the reference interval with a rising (> or =10 ng/L over 2 hours or > or =12 ng/L over 6 hours) pattern are highly suggestive of acute cardiac injury. Decreasing values are indicative of recent cardiac injury. Serial measurement is highly recommended for the diagnosis or exclusion of acute coronary syndromes.

Troponin T values greater than the reference interval are associated with adverse events in patients with ischemic heart disease and many other clinical situations. Clinical judgment is necessary to distinguish patients who have ischemic heart disease from those who do not.

Cautions

As with all markers of cardiac injury, elevations of cardiac troponin T (cTnT) do not in and of themselves indicate the presence of an ischemic mechanism. Many other disease states can be associated with elevations of cTnT via mechanisms different from those that cause injury in patients with acute coronary syndromes. These include trauma including contusion, ablation, and pacing; congestive heart failure; pulmonary embolism; kidney failure; and myocarditis.

Serum biotin concentrations up to 1200 ng/mL do not interfere with this assay. Concentrations up to 1200 ng/mL may be present in specimens collected from patients taking extremely high doses of biotin up to 300 mg/d.(1) In a study among 54 healthy volunteers, supplementation with 20 mg/d biotin resulted in a maximum serum biotin concentration of 355 ng/mL 1-hour postdose.(2)

Clinical Reference

1. Peyro Saint Paul L, Debruyne D, Bernard D, Mock DM, Defer GL. Pharmacokinetics and pharmacodynamics of MD1003 (high-dose biotin) in the treatment of progressive multiple sclerosis. Expert Opin Drug Metab Toxicol. 2016;12(3):327-344. doi:10.1517/17425255.2016.1136288
2. Grimsey P, Frey N, Bendig G, et al. Population pharmacokinetics of exogenous biotin and the relationship between biotin serum levels and in vitro immunoassay interference. J Pharmacokinet Pharmacodyn. 2017;2(4),247-256
3. Sandoval Y, Jaffe AS. Using high-sensitivity cardiac troponin T for acute cardiac care. Am J Med. 2017;130(12):1358-1365
4. Reichlin T, Cullen L, Parsonage WA, et al: Two-hour algorithm for triage toward rule-out and rule-in of acute myocardial infarction using high-sensitivity cardiac troponin T. Am J Med. 2015;128(4):369-379
5. Gunsolus IL, Jaffe AS, Sexter A, et al. Sex-specific 99th percentiles derived from the AACC Universal Sample Bank for the Roche Gen 5 cTnT assay: Comorbidities and statistical methods influence derivation of reference limits. Clin Biochem. 2017 ;50(18):1073-1077

Performance

Method Description

The cobas e immunoassay Troponin T Gen 5 method employs 2 monoclonal antibodies specifically directed against human cardiac troponin T. A biotinylated monoclonal antibody and a second monoclonal antibody labeled with a ruthenium complex react with troponin T to form a sandwich complex. After the addition of streptavidin-coated microparticles, the complex becomes bound to the solid phase via interaction of biotin and streptavidin. The reaction mixture is aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode. Application of a voltage to the electrode then induces chemiluminescent emission which is measured by a photomultiplier.(Package insert: Elecsys Troponin T Gen 5. Roche Diagnostics; V1, 10/2021)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available
Same day/1 day

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
84484

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
TRPS	Troponin T, 5th gen, P	67151-1

Result ID	Test Result Name	Result LOINC® Value
TRPS	Troponin T, 5th gen, P	67151-1