MAYO CLINIC LABORATORIES

Test Definition: PSGN

Plasminogen Activity, Plasma

Overview

Useful For

Evaluating patients with ligneous conjunctivitis (strong association with homozygous plasminogen deficiency)

Evaluating fibrinolysis, in combination with other components of the fibrinolytic system (fibrinogen, tissue plasminogen-activator-inhibitor, and d-dimers)

Special Instructions

- Coagulation Guidelines for Specimen Handling and Processing

Method Name

Chromogenic

NY State Available

Yes

Specimen

Specimen Type

Plasma Na Cit

Ordering Guidance

Coagulation testing is highly complex, often requiring the performance of multiple assays and correlation with clinical information. For that reason, we suggest ordering AATHR / Thrombophilia Profile, Plasma and Whole Blood.

Necessary Information

If priority specimen, mark request form, give reason, and request a call-back.

Specimen Required

Specimen Type: Platelet-poor plasma
Collection Container/Tube: Light-blue top (3.2% sodium citrate)
Submission Container/Tube: Plastic vial (polypropylene preferred)
Specimen Volume: 1 mL
Collection Instructions:
1. For complete instructions, see Coagulation Guidelines for Specimen Handling and Processing.
2. Centrifuge, transfer all plasma into a plastic vial, and centrifuge plasma again.
3. Aliquot plasma into separate plastic vial leaving 0.25 mL in the bottom of centrifuged vial.
4. Freeze plasma immediately (no longer than 4 hours after collection) at -20 degrees C or, ideally at -40 degrees C or below.
Additional Information:

1. A double-centrifuged specimen is critical for accurate results as platelet contamination may cause spurious results.
2. Each coagulation assay requested should have its own vial.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Na Cit	Frozen	14 days	

Clinical & Interpretive

Clinical Information

During the formation of a hemostatic (fibrin) plug, biochemical mechanisms are initiated to limit the extent of the hemostatic process at the site of injury and maintain vascular patency. This process of fibrinolysis is defined as the plasmin-mediated degradation of fibrin. Plasmin limits the extent of the hemostatic process at the site of vessel injury.

Plasmin is generated from its precursor, plasminogen, by plasminogen activators (ie, tissue plasminogen-activator: tPa; urokinase-type plasminogen activator: uPa). Plasminogen is a single-chain glycoprotein that is synthesized in the liver and has a biologic half-life of approximately 2 days.(1) Deficiency of plasminogen may be inherited or acquired. Persons with congenital plasminogen deficiency are at an increased risk for development of an ocular condition called ligneous conjunctivitis. Congenital deficiency of plasminogen is autosomally transmitted and rare in the general population, with a prevalence of approximately 0.4%.(2)

Based on the results of functional and immunologic (antigenic) assays, 2 types of plasminogen deficiency have been identified:
-Quantitative deficiency (type I)-defined by a corresponding decrease in both plasminogen activity and antigen level
-Functional deficiency (type II)-caused by a normally synthesized but dysfunctional plasminogen
This plasminogen activity assay will identify both types of deficiency.

Acquired causes of plasminogen deficiency include consumption such as with thrombolytic therapy (urokinase, tPa) or disseminated intravascular coagulation/intravascular coagulation and fibrinolysis (DIC/ICF), or decreased synthesis (liver disease).(1)

Reference Values

75-140%

Interpretation

Plasminogen activity below 75% may represent a congenital deficiency state, if acquired deficiency can be excluded.

Hereditary abnormalities of plasminogen (deficiency or dysfunction) are very uncommon.

Acquired causes of plasminogen deficiency are much more common and may be the result of consumption due to thrombolytic therapy or intravascular coagulation and fibrinolysis or decreased synthesis (ie, liver disease).

Plasminogen levels are low at birth (approximately 50% of adult normal level) and reach adult levels at 6 months of age.

Cautions

Proper preparation of the blood (plasma) specimen is extremely important to help ensure accuracy of results and interpretation.

Plasminogen results are potentially affected by:
-Elevated levels of fibrinogen
-Heparin (unfractionated or low-molecular-weight) >4 U/mL
-Fibrin degradation products (FDP) >30 mg/dL
-Hemoglobin >200 mg/dL
-Bilirubin >20 mg/dL
-Triglycerides >1000 mg/dL

Clinical Reference

1. Bachman F. Plasminogen-plasmin enzyme system. In: Coman RW, Hirsh J, Marder VJ, et al, eds. Homeostasis and Thrombosis. Lippencott; 2001:275-320
2. Mehta R, Shapiro AD. Plasminogen deficiency. Haemophilia. 2008;14(6):1261-1268
3. Andrews M. The hemostatic system in the infant. In: Nathan DG, Oski FA, eds. Hematology of Infancy and Childhood. Vol 1. 4th ed. WB Saunders Company; 1993:115-153
4. Chandler W. Diagnosis of fibrinolytic disorder. In: Kottke-Marchant Wiley K, ed. Laboratory Hematology Practice. Blackwell Publishing; 2012:460-467
5. Favaloro EJ and Lippi G. eds. Hemostasis and Thrombosis: Methods and Protocols. 1st ed. Humana Press; 2017

Performance

Method Description

This assay is performed using the HemosIL Plasminogen Kit on the ACL TOP instrument. The method is an automated chromogenic assay in which an excess of streptokinase in the presence of fibrinogen is added to sample plasma containing plasminogen. A plasminogen-streptokinase complex is formed. The complex catalyzes the splitting of p-nitroaniline (pNA) from the substrate S-2403 pyroGlu-Phe-Lys-pNAHCl. Under these conditions the enzymatic activity of the complex is not inhibited by plasma inhibitors. The rate at which the pNA is released is measured kinetically at 405 nm and is directly proportional to the plasminogen level in the test specimen. The concentration of plasminogen is calculated from a standard curve prepared from reference plasma dilutions.(Package insert: HemosIL Plasminogen. Instrumentation Laboratory Company; 03/2019)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
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 modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
85420

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PSGN	Plasminogen Activity, P	28660-9

Result ID	Test Result Name	Result LOINC® Value
PSGN	Plasminogen Activity, P	28660-9