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MAYO CLINIC LABORATORIES

Test Definition: F8A

Coagulation Factor VIII Activity Assay, Plasma

Overview

Useful For

Diagnosing hemophilia A

Diagnosing von Willebrand disease when measured with the von Willebrand factor (VWF) antigen and VWF activity

Diagnosing acquired deficiency states

Investigation of prolonged activated partial thromboplastin time

Monitoring infusions of factor VIII replacement during interventional procedures and prophylactic infusions

This test is **not useful for** inferring carrier status in suspected female carriers of hemophilia A, unless it is 50% of normal (<28% activity in adults).

Testing Algorithm

For information see Hemophilia Testing Algorithm.

Special Instructions

- Coagulation Guidelines for Specimen Handling and Processing
- Hemophilia Testing Algorithm

Method Name

Optical Clot-Based

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, consider ordering a Coagulation Consultation.

Specimen Required

Specimen Type: Platelet-poor plasma

Patient Preparation:

1. Patient **should not** be receiving anticoagulant treatment (eg, warfarin, heparin). If not possible for medical reasons, note on request.
 a. If medically feasible, for 4 to 6 hours before specimen collection, **do not** administer intravenous heparin.
 b. If medically feasible, for 10 to 14 days before specimen collection, **do not** administer subcutaneous heparin or warfarin**.**
2. Patient **should not** be receiving fibrinolytic agents (streptokinase, urokinase, tissue plasminogen activator [tPA]).
3. It is recommended that specimens be collected pretransfusion. If patient has been transfused, **a specimen should not be collected for 48 hours.**

Collection Container/Tube: Light-blue top (3.2% sodium citrate)
Submission Container/Tube: 13-mm x 75-mm, 5-mL, plastic vial (polypropylene preferred)
Specimen Volume: 1 mL Platelet-poor plasma
Collection Instructions:
1. Specimen must be collected prior to factor replacement therapy.
2. For complete instructions, see Coagulation Guidelines for Specimen Handling and Processing.
3. Within 4 hours of specimen collection, centrifuge,, transfer all plasma into a plastic vial, and centrifuge plasma again.
4. Aliquot plasma into a 13-mm x 75-mm, 5-mL, polypropylene vial leaving 0.25 mL in the bottom of centrifuged vial.
5. Immediately (within 2 hours of processing) freeze plasma at -20 degrees C or ideally, at or below -40 degrees C.

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.

Forms
If not ordering electronically, complete, print, and send a Coagulation Test Request (T753) with the specimen.

Specimen Minimum Volume
Platelet-poor plasma: 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
Factor VIII is synthesized in the liver and, perhaps, in other tissues. It is a coagulation cofactor that circulates bound to von Willebrand factor and is part of the intrinsic coagulation pathway. The biological half-life is 9 to 18 hours (average is

12 hours).

Congenital factor VIII deficiency is the cause of hemophilia A, which has an incidence of 1 in 10,000 and is inherited in a recessive sex-linked manner on the X chromosome. Severe deficiency (<1%) characteristically demonstrates as hemarthrosis, deep-tissue bleeding, excessive bleeding with trauma, and ecchymoses.

Factor VIII may be decreased in von Willebrand disease. Acquired deficiency states also occur.

Antibodies specific for factor VIII are the most common specific inhibitors of coagulation factors and can produce serious bleeding disorders (acquired hemophilia).

Spuriously decreased results may occur, as factor VIII is highly susceptible to proteolytic inactivation.

Reference Values

Adults: 55-200%
Normal, full-term infants or healthy premature infants typically have levels greater than or equal to 40%.*
*See Pediatric Hemostasis References in Coagulation Guidelines for Specimen Handling and Processing.

Interpretation

Mild hemophilia A: 5% to 50% activity

Moderate hemophilia A: 1% to 5% activity

Severe hemophilia A: <1% activity

Congenital deficiency may also occur in combined association with factor V deficiency.

Liver disease usually causes an increase of factor VIII activity.

Acquired deficiencies of factor VIII have been associated with myeloproliferative or lymphoproliferative disorders (acquired von Willebrand disease: VWD), inhibitors of factor VIII (autoantibodies, postpartum conditions, etc), and intravascular coagulation and fibrinolysis.

Levels may be decreased with von Willebrand factor in VWD.

Cautions

Factor VIII is a labile protein. Improper handling of a specimen may give a false result.

Factor VIII is highly susceptible to proteolytic inactivation, with the potential for spuriously decreased assay results. Normal results can be regarded as reliable, but decreased results need to be correlated with other clinical and laboratory information. Repeat testing may be necessary.

Factor VIII activity in frozen-thawed plasma specimens may be 10% to 20% lower than if assayed in fresh specimens, even under optimum conditions of processing and transportation, and may be even lower if these conditions are suboptimal.

Factor VIII activity rises in response to a number of factors, including pregnancy, estrogen therapy, stress, disease, etc.

Once artefactual reduction of factor VIII is excluded, it is important to measure von Willebrand factor levels to ensure that the patient does not have von Willebrand disease.

Clinical Reference

1. Spreafico M, Peyvandi F. Combined FV and FVIII deficiency. Haemophilia. 2008;14(6):1201-1208
2. Barrowcliffe TW, Raut S, Sands D, Hubbard AR. Coagulation and chromogenic assays of factor VIII activity: general aspects, standardization, and recommendations. Semin Thromb Hemost. 2002;28(3):247-256
3. Franchini M, Lippi G, Favaloro EJ. Acquired inhibitors of coagulation factors: part II. Semin Thromb Hemost. 2012;38(5):447-453
4. Carcao MD. The diagnosis and management of congenital hemophilia. Semin Thromb Hemost. 2012;38(7):727-734
5. Favaloro EJ, Lippi G, eds. Hemostasis and Thrombosis: Methods and Protocols. Humana Press; 2017

Performance

Method Description

The factor VIII assay is performed on the Instrumentation Laboratory ACL TOP using the activated partial thromboplastin time (aPTT) method and a factor-deficient substrate. Patient plasma is combined and incubated with a factor VIII-deficient substrate (normal plasma depleted of factor VIII by immunoadsorption) and an aPTT reagent. After a specified incubation time, calcium is added to trigger the coagulation process in the mixture. Then the time to clot formation is measured optically at a wavelength of 671 nm.(Owen CA Jr, Bowie EJW, Thompson JH Jr. Diagnosis of Bleeding Disorders. 2nd ed. Little, Brown and Company; 1975; Cielsa B. Defects of plasma clotting factors. In: Hematology in Practice. 3rd ed. FA Davis; 2019:chap 17)

PDF Report

No

Day(s) Performed

Monday through Saturday

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.

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

85240

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
F8A	Coag Factor VIII Activity Assay, P	3209-4

Result ID	Test Result Name	Result LOINC® Value
F8A	Coag Factor VIII Activity Assay, P	3209-4