MAYO CLINIC LABORATORIES

Test Definition: CHF8

Chromogenic Factor VIII Activity Assay, Plasma

Overview

Useful For

Monitoring coagulation factor replacement therapy of selected extended half-life coagulation factor replacements

Aiding in the diagnosis of hemophilia A using a 2-stage assay, especially when the 1-stage assay result was normal

Testing Algorithm

This assay is indicated in situations where there is a clinical suspicion of hemophilia A diagnosis, but the 1-stage factor VIII (FVIII) assay result is normal. However, recent guidelines recommend this assay be performed in addition to the 1-stage assay in the initial workup of hemophilia A.

Testing for autoantibodies to FVIII in the presence of a low FVIII activity may be clinically indicated. To add on FVIII inhibitor testing, call 800-533-1710 within 7 days to assess if adequate plasma sample is available.

For more information see Hemophilia Testing Algorithm.

Special Instructions

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

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, a coagulation consultation is recommended.

Specimen Required

Specimen Type: Platelet-poor plasma
Collection Container/Tube: Light-blue top (3.2% sodium citrate)
Submission Container/Tube: Plastic vial
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. Centrifuge, transfer all plasma into a plastic vial, and centrifuge plasma again.
4. Aliquot plasma into plastic vial leaving 0.25 mL in the bottom of centrifuged vial.
5. Immediately freeze plasma (no longer than 4 hours after collection) at -20 degrees C or, ideally, at -40 degrees C or below.

Additional Information:

1. 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	OK
Gross lipemia	OK
Gross icterus	OK
IV heparin contamination	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Factor VIII (FVIII) is synthesized in the endothelial cells of 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 FVIII deficiency is inherited in a recessive X-linked manner and results in hemophilia A, which has an incidence of 1 in 10,000 live male births. Patients with severe deficiency (<1%) experience spontaneous bleeding episodes (eg, hemarthrosis, deep-tissue bleeding), whereas patients with moderate or mild deficiency (>1%) typically experience post-trauma or surgical bleeding.

Factor VIII activity assays (FVIII:C) are performed to diagnose hemophilia A and to monitor FVIII replacement therapy.

FVIII:C assays are typically 1-stage clotting assays. However, there is a subset of patients with mild hemophilia A who have shown discrepantly low results when measured with the 2-stage (chromogenic) assay, indicating that testing patients with a mild bleeding history with both a 1- and 2-stage assay would aid in diagnosis. In addition, there are new treatment options using long-acting glycoPEGylated products. Pharmacokinetic studies are showing that ideal monitoring of patients should be performed by the 2-stage chromogenic assay.

Reference Values

55.0-200.0%

Chromogenic factor VIII activity generally correlates with the one-stage FVIII activity. In full term/premature neonates, infants, children, and adolescents the one-stage FVIII activity* is similar to adults. However, no similar data for chromogenic FVIII activity are available.(Appel IM, Grimminck B, Geerts J, Stigter R, Cnossen MH, Beishuizen A. Age dependency of coagulation parameters during childhood and puberty. J Thromb Haemost. 2012;10[11]:2254-2263)

*See Pediatric Hemostasis References section in Coagulation Guidelines for Specimen Handling and Processing

Interpretation

Factor VIII deficiency may be seen in congenital hemophilia A, acquired (autoimmune) hemophilia A, or von Willebrand disease (congenital and acquired). Laboratory artifacts that may result in artificially reduced factor VIII include specimens collected in EDTA, instead of citrate, or heparin contamination of the plasma specimen.

Elevated factor VIII may be seen in acute or chronic inflammatory states or excess factor VIII replacement therapy.

Cautions

Excess heparin and dilution contamination due to improper specimen collection through an intravenous access device may result in artifactually decreased results.

The 1-stage and chromogenic factor VIII (FVIII) assay results should correlate in the normal population but may be discordant in the hemophilia population and when measuring FVIII replacement.

Clinical Reference

1. Rodgers SE, Duncan EM, Sobieraj-Teague M, Lloyd JV. Evaluation of three automated chromogenic FVIII kits for the diagnosis of mild discrepant haemophilia A. Int J Lab Hematol. 2009;31(2):180-188
2. Kitchen S, Beckmann H, Katterle Y, Bruns S, Tseneklidou-Stoeter D, Maas Enriquez M. BAY 81-8973, a full-length recombinant factor VIII: results from an International comparative laboratory field study. Haemophilia. 2016;22(3):e192-e199. doi:10.1111/hae.129253. Peyvandi F, Oldenburg J, Friedman KD. A critical appraisal of one-stage and chromogenic assays of factor VIII activity. J Thromb Haemost. 2016;14(2):248-261
4. Dodt J, Hubbard AR, Wicks SJ, et al. Potency determination of factor VIII and factor IX for new product labelling and postinfusion testing: challenges for caregivers and regulators. Haemophilia. 2015;21(4):543-549

Performance

Method Description

The Chromogenic Factor VIII assay is performed on the Instrumentation Laboratory ACL TOP Family using the CRYO*check*

Chromogenic Factor VIII kit. In this 2-stage assay, patient plasma is diluted and combined with reagents containing bovine factor X, human factors IXa and IIa, calcium chloride, and phospholipids. The factor VIII in the patient's plasma aids in the activation of factor X to factor Xa. After a specified incubation period, chromogenic substrate is added at which time, the factor Xa, present from the previous step, hydrolyzes the substrate into peptide and p-nitroaniline (pNA). The color produced by the release of pNA is measured photometrically at 405 nm and is proportional to the factor VIII in the sample.(Package insert: CRYO*check* Chromogenic Factor VIII. Precision BioLogic Inc; Rev V04, 06/2020)

PDF Report
No

Day(s) Performed
Monday through Friday

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 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
85130

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CHF8	Chromogenic FVIII, P	49865-9

Result ID	Test Result Name	Result LOINC® Value
CHF8	Chromogenic FVIII, P	49865-9