

Overview

Useful For

Diagnosis of von Willebrand disease (VWD) and differentiation of VWD subtype (in conjunction with von Willebrand factor ristocetin cofactor activity and factor VIII coagulant activity)

Differentiation of VWD from hemophilia A (in conjunction with factor VIII coagulant assay)

Monitoring therapeutic efficacy of treatment with DDAVP (desmopressin) or von Willebrand factor (VWF) concentrates in patients with VWD

Special Instructions

- [Coagulation Guidelines for Specimen Handling and Processing](#)

Method Name

Latex Immunoassay (LIA)

NY State Available

Yes

Specimen

Specimen Type

Plasma Na Cit

Additional Testing Requirements

VWACT / von Willebrand Factor Activity, Plasma and F8A / Coagulation Factor VIII Activity Assay, Plasmaare recommended in conjunction with this test (von Willebrand antigen).

Specimen Required

See [Coagulation Guidelines for Specimen Handling and Processing](#) in Special Instructions.

Specimen Type: Platelet-poor plasma

Collection Container/Tube: Light-blue top (citrate)

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Collection Instructions:

1. Spin down, remove plasma, and spin plasma again.
2. Freeze plasma immediately (no longer than 4 hours after collection) at -20 degrees C or, ideally, at< or =-40 degrees C.

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

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 and Interpretive

Clinical Information

The von Willebrand factor (VWF) is a multimeric adhesive glycoprotein that is important for platelet-platelet and platelet-vessel hemostatic interactions. In addition, plasma VWF serves as a carrier protein for coagulation factor VIII, stabilizing its procoagulant activity. VWF circulates in the blood in 2 distinct compartments; plasma VWF mainly reflects VWF synthesis and release from vascular endothelial cells, and platelet VWF (about 10% of the blood VWF) reflects VWF synthesis by bone marrow megakaryocytes with storage primarily in the alpha granules of circulating platelets. VWF antigen measurement assesses the mass of plasma VWF protein, but does not reflect VWF functions or platelet VWF. The major function of VWF (mediating platelet-platelet or platelet-vessel interaction) is most commonly assessed by measurement of plasma ristocetin cofactor activity.

Decreased VWF antigen may be seen in:

- Congenital von Willebrand disease
- Acquired von Willebrand disease (VWD) that may be associated with monoclonal gammopathies, lymphoproliferative disorders, autoimmune disorders, and hypothyroidism

Increased VWF antigen may be seen in association with:

- Pregnancy and/or estrogen use
- Inflammation (acute-phase reactant)
- Exercise or stress

-Liver disease

-Vasculitis

-Thrombotic thrombocytopenic purpura/hemolytic uremic syndrome

von Willebrand factor (VWF) antigen measurement is most effective when it is combined with measurement of VWF ristocetin cofactor activity and factor VIII coagulant activity, preferably as a panel of tests with reflexive testing and interpretive reporting. Within this context, VWF antigen measurement can be useful for:

-Diagnosis of VWD and differentiation of VWD subtype

-Differentiation of VWD from hemophilia A (in conjunction with factor VIII coagulant assay)

Reference Values

55-200%

Note: Individuals of blood group "O" may have lower plasma von Willebrand factor (VWF) antigen than those of other ABO blood groups, such that apparently normal individuals of blood group "O" may have plasma VWF antigen as low as 40% to 50%, whereas the lower limit of the reference range for individuals of other blood groups may be 60% to 70%.

Children: Neonates, infants, and children have normal or mildly increased plasma VWF antigen, with respect to the adult reference range.

Interpretation

von Willebrand factor (VWF) antigen assay results generally must be used together with assays of VWF ristocetin cofactor activity and factor VIII coagulant activity, for optimum clinical utility and diagnostic efficiency. The diagnosis of von Willebrand disease (VWD) requires a combination of clinical and laboratory information. We suggest ordering AVWPR / von Willebrand Disease Profile.

Patients with congenital severe type III VWD have a markedly decreased or undetectable level of VWF antigen in the plasma (and in the platelets), in addition to a plasma ristocetin cofactor activity that is very low, or not detectable.

Patients with types IIA and IIB variants of VWF (with abnormal plasma VWF function and multimeric structure) may have normal or decreased plasma VWF antigen. However, they typically have decreased plasma ristocetin cofactor activity, along with decreased higher molecular-weight VWF multimers in the plasma.

Patients with types IIM or IIN VWD have normal levels of VWF antigen. In spite of this, they either have decreased VWF ristocetin cofactor activity, not caused by absence of higher molecular weight vWF multimers (type IIM VWD), or decreased factor VIII coagulant activity (type IIN VWD)

Patients with type I VWD (with decreased but normally functioning plasma VWF) have concordantly decreased plasma VWF antigen and ristocetin cofactor activity.

Patients with acquired VWD may have either normal or decreased plasma VWF antigen.

Cautions

Lipemic specimens may lead to an underestimation of the von Willebrand factor (VWF) level.

The presence of rheumatoid factor may lead to an overestimation of the VWF level.

VWF is an acute-phase reactant and may be elevated above baseline in association with a variety of conditions including inflammation, stress, exercise, liver disease, pregnancy or estrogen therapy. Baseline VWF levels also increase with aging. These conditions may obscure diagnosis of the milder forms of von Willebrand disease (VWD). Repeat testing may be indicated.

Low normal levels of VWF antigen do not exclude possible diagnosis of VWD.

Borderline low or slightly decreased levels of VWF antigen may be observed in clinically normal individuals of blood group "O."

Supportive Data

Mayo studies demonstrate excellent concordance between the enzyme-linked immunosorbent assay and this automated latex immunoassay (LIA) ($r[2]=0.95$) in about 80 patient specimens (with von Willebrand factor: VWF antigen ranging from 3% to 800%), and satisfactory concordance between VWF antigen by LIA and ristocetin cofactor activity ($r[2]=0.88$).

Clinical Reference

1. Sadler JE, Blinder M: von Willebrand disease: diagnosis, classification and treatment. In Hemostasis and Thrombosis: Basic Principles and Clinical Practice. Fifth edition. Edited by RW Colman, VJ Marder, AW Clowes, et al. Baltimore, MD, Lippincott Williams and Wilkins, 2006, pp 905-921
2. Eby C, Chance D, Oliver D: A multicenter evaluation of ATA-LIATEST VWF: A new latex particle immunoassay for von Willebrand factor antigen. Clin Hemostasis Rev 1997;11:16-17
3. Rodeghiero F, Castaman G, Tosetto A: Von Willebrand factor antigen is less sensitive than ristocetin cofactor for the diagnosis of type K von Willebrand disease. Results based on an epidemiological investigation. Thromb Haemost 1990;64:349-352
4. Triplett DA: Laboratory diagnosis of von Willebrand disease. Mayo Clin Proc 1991;66:832-840

Performance

Method Description

This assay is performed using the HemosIL von Willebrand Factor Antigen kit on the Instrumentation Laboratory ACL TOP. This is a latex immunoassay method using microlatex particles coated with specific rabbit-polyclonal antibody directed against von Willebrand factor (VWF). In the presence of VWF antigen, antibody-coated latex particles agglutinate to form aggregates of diameters greater than the wavelength of the light passing through the sample and more light is absorbed as aggregation increases. The increase in absorption is proportional to the concentration of VWF antigen present in the sample. (Veyradier A, Fressinaud E, Sigaud M, et al: A new automated method for von Willebrand factor antigen measurement using latex particles. Thromb Haemost 1999;81:320-321)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Saturday

Analytic Time

1 day

Maximum Laboratory Time

3 days

Specimen Retention Time

7 days

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. 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 U.S. Food and Drug Administration.

CPT Code Information

85246

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
VWAG	von Willebrand Factor Ag, P	27816-8

Result ID	Test Result Name	Result LOINC Value
VWAG	von Willebrand Factor Ag, P	27816-8