TEST

Factor VIII assay

A blood test that measures how well clotting factor VIII is working

WHAT IT MEASURES
The activity of clotting factor VIII

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
About 5 to 10 minutes

RESULTS IN
Often 1-3 days; varies by laboratory

USED FOR
Diagnosis and monitoring of bleeding disorders

MAIN LIMITATION
Medicines, inhibitors, and assay method can distort results

Overview

A factor VIII assay is a blood test that measures the activity of factor VIII, a protein that helps blood form a stable clot after an injury.

Low activity may be associated with hemophilia A, an inherited bleeding disorder. It can also occur with von Willebrand disease, because von Willebrand factor carries and protects factor VIII. Less commonly, an antibody blocks factor VIII, causing acquired hemophilia A.

Most laboratories use a one-stage clotting assay . Some use a chromogenic assay , which measures factor VIII through different chemical reactions. The methods may give different results in some people.

Why the test is ordered

A factor VIII assay may be ordered to:

APTT stands for activated partial thromboplastin time. It measures how long blood takes to clot through one part of the clotting system.

The assay is not usually a general screening test for people without a bleeding history or another reason for testing.

- Investigate unusual or prolonged bleeding
- Follow up an abnormal clotting test, especially a prolonged APTT
- Diagnose or classify hemophilia A
- Help distinguish hemophilia A from other bleeding disorders
- Monitor factor VIII replacement treatment
- Look for an antibody blocking factor VIII

Who should have the test

Testing may be appropriate if you have frequent large bruises, repeated nosebleeds, prolonged bleeding after dental work or surgery, heavy menstrual bleeding, or bleeding into muscles or joints. These symptoms have many possible causes and do not confirm a factor VIII problem.

The test may also be offered if hemophilia A runs in your family, another clotting test is abnormal, or factor VIII treatment needs monitoring.

Acquired factor VIII antibodies can develop without a family history of hemophilia. Testing may be considered for new, unexplained bleeding with an abnormal APTT.

How to prepare

You do not usually need to fast. You can generally eat, drink water, and take your usual medicines unless you receive different instructions for other tests being collected.

Tell the testing team about all medicines and treatments, especially:

Do not stop an anticoagulant or hemophilia treatment on your own. If treatment is being monitored, the time between your last dose and the blood draw may be important.

Strenuous exercise, acute illness, inflammation, surgery, and physical stress can temporarily raise factor VIII. You may be asked to avoid hard exercise before a baseline measurement.

- Factor VIII replacement products
- Emicizumab
- Heparin or direct oral anticoagulants

- Recent blood or plasma transfusions

What happens during the test

A healthcare professional places a needle into a vein, usually in your arm. Blood is collected into a tube containing citrate to prevent clotting before analysis.

The needle is normally in place for less than a minute, and the appointment often takes 5 to 10 minutes.

The tube must be filled correctly and processed promptly because unsuitable handling or delays can reduce measured factor VIII activity.

Understanding your results

Results are often reported as a percentage or in international units per decilitre, written as IU/dL. Your report should include the laboratory's reference interval.

Interpretation varies by laboratory, assay method, age, pregnancy status, medicines, and clinical context. A result should not be interpreted alone.

For confirmed hemophilia A, activity is commonly used to describe severity:

People with similar levels can still have different bleeding experiences.

A low result may be associated with hemophilia A, von Willebrand disease, a factor VIII inhibitor, treatment effects, or sample-handling problems. Further testing is usually needed.

Factor VIII may be high during pregnancy, inflammation, infection, physical stress, or after surgery, and levels may increase with age. A single high result does not establish a diagnosis. Repeat testing when you are well may differ.

- Severe: below 1 IU/dL
- Moderate: 1 to 5 IU/dL
- Mild: above 5 to below 40 IU/dL

What affects the results

Recent factor VIII treatment, plasma, or a blood transfusion can raise measured activity. A sample taken just before treatment provides different information from one taken soon afterward.

Emicizumab strongly affects APTT-based tests, so a standard one-stage assay can give a misleadingly high result. A suitable chromogenic assay may be needed to measure your own factor VIII or an inhibitor.

Heparin, direct oral anticoagulants, and lupus anticoagulant like warfarin or apixaban can interfere with some methods, sometimes making factor VIII appear lower than it is.

Factor VIII may temporarily rise because of:

Von Willebrand factor and blood group also influence usual levels.

An underfilled tube, partially clotted sample, delayed processing, or unsuitable transport can produce an inaccurate result. A very high red blood cell concentration may require adjustment of the citrate in the tube.

- Infection, inflammation, or recent surgery
- Strenuous exercise or physical stress
- Pregnancy or estrogen exposure
- Increasing age

Accuracy and limitations

A factor VIII assay can detect clearly reduced activity when the sample is collected and processed correctly, but it is not perfect.

Some forms of mild hemophilia A give a low result with a one-stage assay but a higher or normal result with a chromogenic assay, or the reverse. Using only one method can miss some cases. Stress or illness may also temporarily hide a mild deficiency.

Medicines and interfering antibodies can produce misleading activity levels. If the result does not fit your bleeding history or other tests, the laboratory may repeat it using another method.

The assay cannot identify every cause of low factor VIII by itself. Von Willebrand factor tests assess von Willebrand disease. A mixing study and Bethesda-type inhibitor test may look for an antibody against factor VIII. Genetic testing can help confirm inherited hemophilia or clarify family risk, but does not replace activity testing.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or light-headedness. Serious complications are uncommon.

What happens next

A result within the expected range may need no further action if it fits the reason for testing. If bleeding remains unexplained, other platelet or clotting tests may be considered.

A low or unexpected result is often repeated, particularly if you were ill, taking an interfering medicine, or recently received treatment. Follow-up may include an APTT, von Willebrand factor tests, a chromogenic assay, an inhibitor test, or genetic testing.

For treatment monitoring, the result is compared with the type and timing of your most recent dose. Some factor VIII products and non-factor treatments require specific laboratory methods.

Routine follow-up is appropriate for a stable result without active bleeding. Seek urgent medical help for bleeding that will not stop, rapidly increasing swelling, vomiting or coughing blood, black or bloody stools, or blood in the urine. After a significant head injury, or for a sudden severe headache, confusion, weakness, or repeated vomiting, seek emergency care.

Common questions

Can I drink coffee before the test?

Usually, yes. Fasting is not required. Follow any fasting instructions for other tests being collected.

Does the time of day matter?

There is no standard time for routine testing. Timing matters when checking peak or lowest levels around factor VIII treatment.

Can I exercise beforehand?

Light activity is unlikely to be a problem. Strenuous exercise can temporarily increase factor VIII, so you may be asked to avoid it before a baseline test.

Should I take my medicines before the test?

Usually, but do not make changes without instructions. Bring a list of anticoagulants, factor treatments, emicizumab, and the times of your latest doses.

Can I have the test during my period?

Yes. Menstruation does not prevent testing, although heavy menstrual bleeding is relevant to your bleeding history.

Why might I need the test repeated?

Factor VIII changes with illness, stress, pregnancy, treatment, and some medicines. Repeating the test or using another assay can show whether an unexpected result persists.

Sources

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- Peyvandi F, Oldenburg J, Friedman KD: A critical appraisal of one-stage and chromogenic assays of factor VIII activity , Journal of Thrombosis and Haemostasis , 2016