

Laboratory and Other Studies for Thrombophilias

Test	Notes
Activated protein C resistance assay (modified)	Sensitivity, 98%; specificity, 99%. 95% of activated protein C resistance is due to the factor V Leiden gene mutation; thus, the activated protein C resistance assay is a good screen. False-positive results in pregnancy and oral contraceptive pill use. All positive results should be confirmed with direct genetic testing for the factor V Leiden gene mutation
Factor V Leiden gene mutation	Sensitivity, 100%; specificity, 100%. A direct PCR gene test. Test of choice even while screening for activated protein C resistance in patients who are pregnant or receiving estrogen or oral contraceptive pills
Prothrombin gene mutation	Sensitivity, 100%; specificity, 100%. A direct PCR gene test
Protein C deficiency	Functional assay (preferably amidolytic) should be done. Should see two abnormal results. Active thrombosis and use of warfarin lower protein C levels and may cause false-positive results
Protein S deficiency	Antigenic assay for free protein S should be done. Two abnormal results needed. Active thrombosis, use of warfarin, and pregnancy all lower protein S levels and may cause false-positive results
Antithrombin III deficiency	Both antigenic and functional assay should be done. Need two abnormal results. Active thrombosis and use of heparin may cause false-positive results by lowering antithrombin III levels
Fasting plasma homocysteine level	The risk for thrombosis increases as levels exceed 10 $\mu\text{mol/L}$. Renal failure and vitamin deficiencies can cause false-positive results. Pregnancy may artificially lower levels
Methylenetetrahydrofolate reductase (MTHFR) gene mutation	A direct gene test. Only useful if it shows increased homocysteine levels, which have been associated with thrombosis
Lupus anticoagulant	Test for lupus anticoagulant activity with a phospholipid dependent clotting assay. If this assay is prolonged, it should not correct with mixing with normal plasma, but it should correct with platelet phospholipid neutralization. Greater prolongation of phospholipid-dependent tests are more specific

Anticardiolipin antibodies (immunoglobulin G, immunoglobulin M)

ELISA testing.

Levels fluctuate; thus, positive tests should be repeated and levels should reflect at least moderate titers.

More specific when measured as bound to B2 glycoprotein, and when high titers are present

ELISA = enzyme-linked immunosorbent assay; PCR = polymerase chain reaction.

Table modified from Physicians' Information and Education Resource (PIER), *Thrombophilia* module.