Quest Diagnostics®

Bleeding and thrombosis

Better answers from high-quality testing

Bleeding profiles and screening tests
von Willebrand disease
Factor assays and inhibitors
Anticoagulant therapy
HIT, TTP, and platelet studies
Fibrinolysis and markers of thrombin generation
Thrombotic risk markers and profiles—inherited
Antiphospholipid antibody & lupus anticoagulant
Women's health
Enhanced Reporting

Bleeding and thrombosis **test menu**

Quest Diagnostics offers a comprehensive menu of routine and esoteric tests for bleeding and thrombosis. We have organized our test menu by category for easy navigation. Simply click on a category to the left to view the tests available for ordering. You can also scroll down to view the entire menu, as well as valuable tools like specimen collection instructions/video, a list of tests affected by anticoagulants, pediatric reference ranges, and more.

Our physicians and scientists provide diagnostic insights in the form of interpretive messages, consultative reports, test FAQs, and physician consults. We also recognize the importance of timely results and are a leader in time-to-result testing with high clinical imperatives (eg, ADAMTS13 Activity, Heparin-dependent platelet antibody testing).

Our Medical Team is available to assist with any inquiries at 1.866.MY.QUEST or by contacting our Nichols Institute locations directly.

Quest Diagnostics Nichols Institute:
Chantilly, VA 1.800.336.3718
San Juan Capistrano, CA 1.800.642.4657

Bleeding profiles and screening tests

Test name	Test codes	Panel components	Specimen requirements
Alpha-2-Antiplasmin	4953		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.6 mL minimum
Fibrinogen Activity, Clauss	461		1 room-temperature, full, unopened 3.2% sodium citrate (light blue-top) tube or 0.5 mL frozen platelet-poor plasma minimum
Mixing Study	8922	Always includes PT, PTT-LA and interpretation. Possible reflexes are PT 1:1 Immediate Mixing Study and/or PTT-LA 1:1 Immediate and Incubated Mixing Study	2.5 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 1.5 mL minimum
Partial Thromboplastin Time, Activated	763		1 room-temperature, full, unopened 3.2% sodium citrate (light blue-top) tube or 0.5 mL frozen platelet-poor plasma minimum
Prothrombin Time with INR	8847		1 room-temperature, full, unopened 3.2% sodium citrate (light blue-top) tube or 0.5 mL frozen platelet-poor plasma minimum
Reptilase Clotting Time	37700		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Thrombin Clotting Time	883		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Prolonged aPTT Bleeding Evaluation[1]	19644X[a]	Always includes aPTT, interpretation. Possible reflexes: aPTT Mixing Study, FVIII, FIX, FXI Activities, VWF Antigen, Ristocetin Cofactor Activity, Thrombin Time, Hexagonal Phase Confirm.	Four 1 mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube])
Prolonged aPTT Asymptomatic Evaluation[1]	19645X[a]	Always includes: aPTT, Thrombin Time, interpretation. Possible reflexes: aPTT Mixing Study, FVIII, FIX, FXI Activities, Hexagonal Phase Confirm, VWF Antigen, Ristocetin Cofactor, Heparin Anti-Xa, Fibrinogen.	Four 1 mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four 0.5 mL tubes minimum
Prolonged aPTT Thrombotic Evaluation[1]	19648X[a]	Always includes: PTT-LA, DRVVT Screen, Interpretation. Possible reflexes: Hexagonal Phase Confirm, Thrombin Time, DRVVT Confirm, DRVVT Mixing Study, Fibrinogen, PT.	Four 1 mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four 0.5 mL tubes minimum
Prolonged PT Evaluation[1]	19643X[a]	Always includes: PT-INR, interpretation. Possible reflexes: PT Mixing Study, FV, FVII, FX Activities.	Four 1 mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four 0.5 mL tubes minimum
Thrombin Clotting Time with Reflex to Mixing Study	144598[a]	Includes Thrombin Clotting Time (TT) with reflex to Mixing Study when the TT is prolonged	Two 1 mL frozen platelet-poor plasma tubes (3.2% sodium citrate [light blue-top tube]); two 0.5 mL tubes minimum

[a] Chantilly only

All panel components can be ordered separately. Reflex tests are performed at an additional charge and are associated with an additional CPT code.

von Willebrand disease

Test name	Test codes	Panel components	Specimen requirements
Factor VIII Activity, Clotting	347		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Ristocetin Cofactor Activity	4459		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
von Willebrand Antigen, Multimeric Analysis	5168		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
von Willebrand Comprehensive Panel[2]	19790	aPTT; Factor VIII Activity, Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor; von Willebrand Antigen, Multimeric Analysis; Interpretation	Four 1-mL aliquots frozen plasma (3.2% sodium citrate [light blue-top tube]); four 0.75-mL aliquots, minimum
von Willebrand Comprehensive Panel 2[2]	15540	aPTT, Factor VIII Activity Clotting, von Willebrand Factor Antigen, Ristocetin Cofactor, von Willebrand Factor Collagen Binding Assay, von Willebrand Antigen Multimeric Analysis, Interpretation	Four 1-mL aliquots frozen plasma (3.2% sodium citrate [light blue-top tube]); four 0.75-mL aliquots, minimum
von Willebrand Factor Antigen	4919		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
von Willebrand Factor Collagen Binding Assay[2]	10924		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
von Willebrand Screen	90271	aPTT; Factor VIII Activity, Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor	Three 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); three 0.75 mL aliquots minimum
von Willebrand Disease Type 2N (vWF: Factor VIII)	70068		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

Factor assays and inhibitors

Test name	Test codes	Panel components	Specimen requirements
Factor IX Activity and Human Inhibitor	17845	If FIX Activity ≤20%, then FIX Inhibitor (Bethesda Assay) performed	Two 2-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 1-mL aliquots minimum
Factor IX Activity, Clotting	352		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor V Activity and Human Inhibitor	17844	If FV Activity ≤ 20%, then FV Inhibitor (Bethesda Assay) will be performed	Two 2-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 1-mL aliquots minimum
Factor VII Activity, Clotting	346		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

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All panel components can be ordered separately. Reflex tests are performed at an additional charge and are associated with an additional CPT code.

Factor assays and inhibitors (continued)

Test name	Test codes	Panel components	Specimen requirements
Factor VIII Activity, Chromogenic	16049		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor VIII Activity, Clotting	347		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor VIII Inhibitor Panel	40083	Includes FVIII Activity, Clotting and FVIII Inhibitor, EIA Screen. If EIA positive, then FVIII Human Inhibitor (Nijmegen Assay) performed	Three 2-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); three 1-mL aliquots minimum
Factor X Activity, Chromogenic	10663		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor X Activity, Clotting	359		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor XI Activity and Human Inhibitor	17854	If FXI Activity ≤20%, then FXI Inhibitor (Bethesda Assay) performed	Two 2-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 1-mL aliquots minimum
Factor XI Activity, Clotting	360		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor XI Mutation Analysis (Ashkenazi Jewish)[2,3]	16023		5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Factor XII Activity, Clotting	362		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor XIII, Functional[2]	14461		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.3 mL minimum
Factor II Activity, Clotting	331		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor V Activity, Clotting	344		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fibrinogen Activity, Clauss	461		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fibrinogen Antigen, Nephelometry	37801		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor IX Antigen	91053		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor VIII Antigen	90879		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

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Anticoagulant therapy

Test name	Test codes	Specimen requirements	Specimen Requirements
AccuType® Warfarin[3,4]	16160	Includes variations in 2 genes (*VKORC1* and *CYP2C9*)	5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Apixaban (Xa Inhibition; Eliquis™)	94223		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]) ; 0.5 mL minimum
Dabigatran with Reflex to Thrombin Time (Pradaxa™)	91115	Reflex to Thrombin Clotting Time if dabigatran <45 ng/mL	1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fondaparinux Sodium (Xa Inhibition; Arixtra™)	16103		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Heparin, Anti-Xa for UFH and LMWH	30292		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Prothrombin Time with INR	8847		1 room-temperature, full, unopened 3.2% sodium citrate (light blue-top) tube ; 0.5 mL frozen platelet-poor plasma minimum
Rivaroxaban (Xa Inhibition; Xarelto®)	90981		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Vitamin K	36585		4 mL frozen plasma (sodium heparin [green-top tube]); 2 mL minimum

HIT, TTP, and platelet studies

Test name	Test codes	Panel components	Specimen requirements
ADAMTS13 Activity with Reflex to Inhibitor[2]	14532	ADAMTS13 activity with reflex to ADAMTS13 inhibitor when activity is ≤30%	1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Aspirin Resistance (11-Dehydrothromboxane B2)	16174		4 mL room-temperature random urine (BD C&S Vacutainer® tube); 3 mL minimum
Heparin-Induced Platelet Antibody	414		1 mL frozen serum (red-top [no gel] tube); 0.5 mL minimum
Heparin-Induced Platelet Antibody with Reflex to SRA, Unfractionated Heparin	15334	Reflex to SRA (unfractionated heparin) when heparin-induced antibody weak positive or positive	Two 1-mL aliquots frozen serum, two 0.5-mL aliquots minimum
Heparin-Induced Thrombocytopenia Panel[3]	14874	Serotonin Release Assay (SRA), Unfractionated Heparin; Heparin-Induced Platelet Antibody	Two 1-mL aliquots frozen serum (red-top [no gel] tube), two 0.9-mL aliquots minimum
Human Platelet Antigen 1 Genotype	10707	Detects variant that may lead to neonatal alloimmune thrombocytopenia	5 mL room-temperature whole blood (EDTA [lavender-top tube]); 1 mL minimum

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All panel components can be ordered separately. Reflex tests are performed at an additional charge and are associated with an additional CPT code.

HIT, TTP, and platelet studies (continued)

Test name	Test codes	Panel components	Specimen requirements
Platelet Antibody Screen (Indirect)	94303	Detects Antibodies to HLA class I antigens and platelet-specific glycoproteins IIb/IIIa, Ia/IIa, Ib/IX and IV	3 mL frozen serum (red-top [no gel] tube); 1 mL minimum
Platelet Antibody, Direct, Flow Cytometry[5]	5019	Detects platelet-associated IgG, IgA and IgM antibodies	7 mL room-temperature whole blood (EDTA [lavender-top tube]); 5 mL minimum
Serotonin Release Assay (SRA), LMWH[3]	16284		1 mL frozen serum; 0.4 mL minimum
Serotonin Release Assay (SRA), Unfractionated Heparin	14627		1 mL frozen serum; 0.4 mL minimum

Fibrinolysis and markers of thrombin generation

Test name	Test codes	Panel components	Specimen requirements
D-Dimer, Quantitative	8659		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Euglobulin Clot Lysis Time	462		2 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 1 mL minimum
Fibrin Monomer	11074		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fibrinogen Activity, Clauss	461		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fibrinogen Antigen, Nephelometry	37801		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fibrinogen Degradation Products (FDP), Semiquantitative	458		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fibrinolysis Comprehensive Panel	90923	Alpha 2-Antiplasmin; D-Dimer, Quantitative; Euglobulin Clot Lysis Time; Fibrinogen Degradation Products, Semi-Quantitative; Plasminogen Activator Inhibitor-1; Plasminogen Activity; Tissue Plasminogen Activator, EIA; Fibrin Monomer	Four 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four 0.8-mL aliquots minimum
Plasminogen Activator Inhibitor-1 (PAI-1) 4G/5G[3,4]	11368		5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Plasminogen Activity	4458		1.0 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

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Fibrinolysis and markers of thrombin generation (continued)

Test name	Test codes	Panel components	Specimen requirements
Plasminogen, Antigenic	5164		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Prothrombin Fragment 1.2	37674		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Thrombin-Antithrombin (TAT) Complex	10162		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Tissue Plasminogen Activator (TPA), EIA	29816		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.3 mL minimum
Thrombotic Marker Panel with Consulatation	19685	D-Dimer, Fibrin Monomer, Prothrombin Fragment 1.2, Thrombin-Antithrombin (TAT) Complex; Coagulation Consult	Three 2 mL aliqutos frozen platelet-poor plasma (3.2% sodium citrate [light-blue top tube]; three 1 mL aliquots minimum
Thrombotic Marker Panel	11345X	D-Dimer, Fibrin Monomer, Prothrombin Fragment 1.2, Thrombin-Antithrombin (TAT) Complex	Same as above
Fibrinogen Comprehensive Panel without Consultation	14458	Fibrinogen Activity Clauss, Thrombin Clotting Time with Reflex to Mixing Study, Reptilase Clotting Time, Fibrinogen Antigen Nephelometry	Four 1 mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light-blue top tube]); four 0.5 mL aliquots minimum
Fibrinogen Comprehensive Panel with Consultation	19903	Fibrinogen Activity Clauss, Thrombin Clotting Time with Reflex to Mixing Study, Reptilase Clotting Time, Fibrinogen Antigen Nephelometry; Coagulation Consult	Same as above

Thrombotic risk markers and profiles—inherited/acquired

Test name	Test codes	Panel components	Specimen requirements
Activated Protein C-Resistance	22		2 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 1 mL minimum
Activated Protein C Resistance with Reflex to Factor V (Leiden) Mutation[5]	19704	If APCR <2.1 ratio, Factor V Leiden Mutation will be performed	2 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]) and 4 mL frozen whole blood (EDTA [lavender-top tube]); 1 mL plasma and 2 mL whole blood minimum
Antithrombin III Activity	216		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Antithrombin III Activity and Antigen	7017		Two 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 0.5-mL aliquots minimum
Antithrombin III Activity with Reflex to Antithrombin III Antigen	8267	If ATIII Activity decreased, ATIII Antigen will be performed	Two 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 0.5-mL aliquots minimum
Antithrombin III Antigen	5158		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

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All panel components can be ordered separately. Reflex tests are performed at an additional charge and are associated with an additional CPT code.

Thrombotic risk markers and profiles—inherited/acquired (continued)

Test name	Test codes	Panel components	Specimen requirements
Factor V (Leiden) Mutation Analysis[5]	17900		5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Homocysteine	31789		1 mL room-temperature serum (red-top [no gel] tube); 0.5 mL minimum
Lipoprotein (a)	34604		1 mL room-temperature serum (red-top [no gel] tube); 0.5 mL minimum
Methylenetetrahydrofolate Reductase (MTHFR), DNA Mutation Analysis[5]	17911		5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Protein C Activity	1777		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Protein C Activity and Antigen	8757		Two 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 0.5-mL aliquots minimum
Protein C Activity with Reflex to Protein C Antigen	8754	If Protein C Activity is decreased, Protein C Antigen will be performed	Two 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 0.5-mL aliquots minimum
Protein C and Protein S, Functional	39457	Protein C Activity, Protein S Activity	Two 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 0.5-mL aliquots minimum
Protein C and S Activity with Reflex to Protein C and/or S Antigen	7942	If Protein C Activity is decreased, Protein C Antigen is performed. If Protein S Activity is decreased, Protein S Antigen, Total is performed.	Two 2-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two 1-mL aliquots minimum
Protein C Antigen	4948		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Protein S Activity	1779		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Protein S Activity with Reflex to Protein S Antigen, Total and Free	17494	If Protein S Activity is abnormally low, Protein S Antigen Total and Free will be performed at an additional charge	2 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 1 mL minimum
Protein S Antigen, Free	10170		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Protein S Antigen, Total	5165		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Protein S Antigen, Total and Free	36457		2 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 1 mL minimum

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Thrombotic risk markers and profiles—inherited/acquired (continued)

Test name	Test codes	Panel components	Specimen requirements
Prothrombin Factor II 20210G>A Mutation Analysis[5]	17909		5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Thrombophilia DNA Mutation Analysis[5]	17907	Factor V (Leiden) and Prothrombin (Factor II) Gene Analysis	5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Thrombophilia Screen II, Inherited[5]	11327	Factor V (Leiden) Mutation with Reflex to HR2 Mutation Analysis; Prothrombin Gene Mutation; Antithrombin III Activity; Protein C Activity; Protein S Antigen, Free	Three 1-mL aliquots frozen plasma (3.2% sodium citrate [light blue-top tube]) and 5 mL whole blood (EDTA [lavender-top tube]); three 0.5-mL aliquots plasma and 5 mL whole blood minimum
Protein S Panel	11343	Protein S Activity, Protein S, Antigen, Free and Total, C4 Binding Protein	Two 1 mL frozen aliquots platelet-poor plasma (3.2% sodium citrate [light-blue top tube]); two 0.5 mL aliquots
Venous Thrombosis Panel w/ Reflex	19623	Cardiolipin and B2GPI Antibodies (IgG, IgM), PTT-LA w/ reflex to Hexagonal Phase Confirm and TT, dRVVT Screen w/ reflex to dRVVT Confirm and dRVVT Mixing Study, APC-R w/ reflex to Factor V (Leiden) Mutation Analysis, ATIII Activity, PC Activity, PS Free Antigen, PS Total Antigen, FVIII Activity, Homocysteine, Prothrombin (Factor II) Gene Analysis	Five 1 mL frozen aliquots citrated platelet-poor plasma; 1 mL room temperature serum; one 5 mL room temperature whole blood (EDTA [lavender-top tube])

Antiphospholipid antibody and lupus anticoagulant

Test name	Test codes	Panel components	Specimen requirements
Antiphospholipid Antibody Panel	14890	Beta-2-Glycoprotein I, Cardiolipin and Phosphatidylserine Antibodies (IgG, IgA, IgM)	5 mL refrigerated platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 3.0 mL minimum
Antiphospholipid Syndrome Diagnostic Panel	19872	Cardiolipin and Beta-2-Glycoprotein I Antibodies (IgG, IgA, IgM); Lupus Anticoagulant Evaluation with Reflex	3 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 2 mL minimum
Beta-2-Glycoprotein I Antibodies (IgG, IgA, IgM)	30340		3 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 1.5 mL minimum
Beta-2-Glycoprotein I Antibody (IgA)	36552		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Beta-2-Glycoprotein I Antibody (IgG)	36554		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Beta-2-Glycoprotein I Antibody (IgM)	36553		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

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Antiphospholipid antibody and lupus anticoagulant (continued)

Test name	Test codes	Panel components	Specimen requirements
Cardiolipin Antibodies (IgG, IgM)	36333		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Cardiolipin Antibody (IgA)	4661		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Cardiolipin Antibody (IgG)	4662		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Cardiolipin Antibody (IgM)	4663		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
DRVVT Screen with Reflex to DRVVT Confirm and DRVVT 1:1 Mix	15780		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Lupus Anticoagulant Evaluation with Reflex	7079	Always includes PTT-LA, DRVVT Screen and Interpretation. Possible reflexes are Hexagonal Phase Confirm, Thrombin Clotting Time, DRVVT Confirm and DRVVT Mixing Study.	3 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 2 mL minimum
Lupus Anticoagulant and Antiphospholipid Confirmatory Panel	19652	Cardiolipin and B2GPI Antibodies (IgG, IgM), Prolonged aPTT Thrombotic Evaluation	Four 1 mL frozen aliquots platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four 0.5 mL aliquots
Lupus Anticoagulant and Antiphospholipid Confirmatory Panel on Coumadin	19672	Cardiolipin and B2GPI Antibodies (IgG, IgM), Hexagonal Phase Confirm, dRVVT Screen w/ reflex to dRVVT Confirm and dRVVT Mixing Study, PT with INR, TT	Same as above
Phosphatidylserine Antibodies (IgG, IgA, IgM)	10062		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Phosphatidylserine Antibodies (IgG, IgM)	36595		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Phosphatidylserine Antibody (IgA)	10163		1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Prothrombin Antibodies (IgG)	94041		1 mL frozen plasma (3.2% sodium citrate [light blue-top tube]); 0.3 mL minimum
PTT-LA with Reflex to Hexagonal Phase Confirmation	17408		1.5 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

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Women's health

Test name	Test codes	Panel components	Specimen requirements
Menorrhagia Screen without Consultation	19649	aPTT; PT with INR; Factor XI Activity; von Willebrand Factor Antigen; Ristocetin Cofactor Activity; Factor VIII Activity	Three 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light bluetop tube]); two 1-mL aliquots minimum
von Willebrand Comprehensive Panel	19790	aPTT, Factor VIII Activity, Clotting, von Willebrand Factor Antigen, Ristocetin Cofactor Activity, von Willebrand Antigen Multimeric Analysis, Interpretation	Four 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light bluetop tube]); four 0.75-mL aliquots minimum
von Willebrand Comprehensive Panel 2[2]	15540	aPTT, Factor VIII Activity Clotting, von Willebrand Factor Antigen, Ristocetin Cofactor Activity, von Willebrand Factor Collagen Binding Assay, von Willebrand Antigen Multimeric Analysis, Interpretation	Four 1-mL aliquots frozen platelet-poor plasma (3.2% sodium citrate [light bluetop tube]); four 0.75-mL aliquots minimum
von Willebrand Screen	90271	aPTT; Factor VIII Activity, Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor	Three 2-mL aliquots frozen plasma (3.2% sodium citrate [light blue-top tube])

Enhanced Reporting

Test name	Test codes	Panel components	Specimen requirements
Coagulation Consultation	19682X	A consultative report can be added to any single or group of test codes performed at the Nichols Institute in Chantilly	

[1] The Prolonged aPTT and PT panels are only available at the Quest Diagnostics Chantilly, VA laboratory.

[2] This test was performed using a kit that has not been cleared or approved by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics. This test should not be used for diagnosis without confirmation by other medically established means.

[3] This test was developed and its performance characteristics have been determined by Quest Diagnostics. Performance characteristics refer to the analytical performance of the test.

[4] This test is performed pursuant to a license agreement with Orchid Biosciences Inc.

[5] This test was developed and its performance characteristics have been determined by Quest Diagnostics. It has not been cleared or approved by the FDA. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

Multiple test codes may be used for a test. Please refer to your local business unit or the online Directory of Services (TestDirectory.QuestDiagnostics.com).

Tests affected by anticoagulants

It's important to note that certain anticoagulant drugs can interfere with clot-based assays, as shown in the table below.

Test Name	Test Codes	Warfarin	Heparin (UFH or LMWH)[1]	Thrombin Inhibitors[1] (ie, Dabigatran, Argatroban)	Factor Xa Inhibitors1 (ie, Rivaroxaban, Apixaban, Edoxaban)
aPTT	763	Prolonged	Prolonged	Prolonged	Prolonged
PT/INR	8847	Prolonged	Little to no effect[2]	Normal to prolonged	Prolonged
Fibrinogen Activity *(Clauss Method)*	461	No effect	No effect (LMWH) to falsely low (UFH)	No effect or falsely low	No effect
Thrombin Clotting Time	883	No effect	Prolonged	Prolonged	No effect
aPTT-based factor assays *(FVIII Activity, FIX Activity, Factor XI Activity, Factor XII Activity)*	347, 352, 360, 362	FIX: Physiologic decrease FVIII/XI/XII: No effect	No effect to inhibitor pattern	No effect to inhibitor pattern	No effect to inhibitor pattern
PT-based factor assays[2] *(FII Activity, FV Activity, Factor VII Activity, Factor X Activity)*	331, 344, 346, 359	FII/VII/X: Physiologic decrease Factor V: No effect	No effect[2]	No effect to inhibitor pattern or falsely low	No effect to inhibitor pattern
Antithrombin Activity *(Thrombin-Based Method)*	216	No effect	No effect to decrease[3]	May falsely increase	No effect
Antithrombin Antigen	5158	No effect	No effect to decrease[3]	No effect	No effect
Protein C Antigen	4948	No effect to physiologic decrease	No effect	No effect	No effect
Protein C Activity *(Clot-Based Method)*	1777	Physiologic decrease	UFH: No effect LMWH: may falsely increase at higher levels	May falsely increase	May falsely increase
Protein S Antigen, Free	10170	Physiologic decrease	No effect	No effect	No effect
Protein S Antigen, Total	5165	No effect to physiologic decrease	No effect	No effect	No effect
Protein S Activity *(Clot-Based Method)*	1779	Physiologic decrease	May falsely increase at values ~>1.0 IU/mL	May falsely increase	May falsely increase
Activated Protein C Resistance *(FV-dependent Prothrombin Venom-Based Method)*	22	No effect	No effect	Unable to obtain assay endpoint[1]	No effect
Lupus Anticoagulant, (LA); *(PTT-LA with reflex to Hexagonal Phase Confirm & reflex to Thrombin Time; DRVVT Screen with reflex to DRVVT Confirm and DRVVT 1:1 Mixing Study)*	7079	Screening tests may be prolonged but confirmatory tests include mixing studies which correct for warfarin-induced factor deficiencies	Possible to misclassify as LA positive (panel may include Thrombin Time, which will detect UFH/LMWH)	Possible to misclassify as LA positive (panel may include Thrombin Time, which will detect thrombin inhibitors)	Possible to misclassify as LA positive
Antiphospholipid Antibody Panel	14890	No effect	No effect	No effect	No effect

1. Therapeutic levels. Potential interference dependent on drug concentration.
2. Reagent contains a heparin neutralizer.
3. UFH may decrease levels physiologically but no assay interference.

Commonly misordered tests

Knowing when to order the correct test or differentiating between two tests with similar names can be difficult. We realize the importance of ordering the correct test the first time and have identified several tests as being "commonly misordered." The list below provides a summary of those tests and includes the test name, test code, and appropriate use for each test. If you would like to see a full description for any test, please go to TestDirectory.QuestDiagnostics.com

Commonly Misordered Tests	Test Codes	Appropriate Use for Test Code Specified
Factor II	331	Factor II: bleeding risk
	17909	Factor II Prothrombin 20210G>A Mutation Analysis: thrombotic risk
Factor V	344	Factor V Activity: bleeding risk
	17900	Factor V Leiden Mutation: thrombotic risk
Factor VIII	347	Factor VIII: bleeding/thrombotic risk
	16049	Factor VIII Chromogenic: bleeding/thrombotic risk in patients with lupus anticoagulant or other inhibitors
	40083	Factor VIII Inhibitor Panel
	14461	Factor XIII: bleeding risk - common clerical error
Factor X	359	Factor X Activity: bleeding risk
	10663	Factor X Chromogenic: warfarin monitoring for patients with lupus anticoagulant
	30292	Anti Xa: monitoring heparin or LMWH
Anti Xa (Xa Inhibition)	16103	Fondaparinux (Arixtra)
	90981	Rivaroxaban (Xarelto)
	94223	Apixaban (Eliquis)
	30292	Heparin (UFH or LMWH)
Ristocetin	4459	Ristocetin Cofactor Activity
	Test not offered	Ristocetin-induced platelet aggregation: not offered due to short specimen stability
Serotonin	14627	Serotonin Release Assay: HIT/HITT
	818	Serotonin: neuroendocrine hormone
PF4 (anti PF4)	414	Anti-PF4: heparin-induced platelet antibody
	Test send out	PF4: platelet factor 4

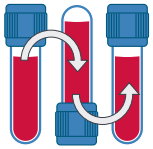
Specimen Collection Instructions

Preparing Platelet-Poor Plasma for Coagulation Testing

1

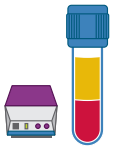
Fill Vacutainer to the minimum required fill line.

2



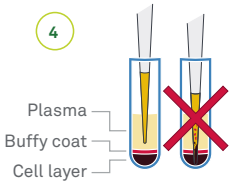
Immediately after collection, mix specimen by gentle inversion four times.

3



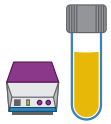
Centrifuge at 1500 x g for 15 minutes.

4



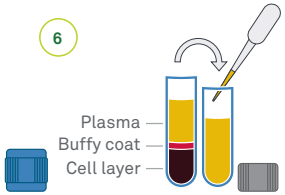
Remove plasma without disturbing the buffy coat or cell layer at the bottom of the tube.

5



Cap and centrifuge plasma at 1500 x g for 15 minutes.

6



Use a plastic pipette to transfer plasma to a plastic tube without disturbing the buffy coat or cell layer.

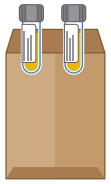
7

Transfer plasma to plastic storage tubes. Ideally PPP platelet count should not exceed 10,000/ul.

8

Label tubes with patient information and specimen type (i.e. citrate plasma).

9



FREEZE specimens.
Do not use a self-defrosting freezer.

For multiple tube collection, follow the order below for blood drawing:

	Cap Color	Collection Tube
Draw First		Blood Cultures
		Citrate Tube
	or	Serum Tube
		Heparin Tube
		EDTA Tube
Draw Last		Fluoride (Glucose) Tube

Watch our brief step-by-step video on proper technique for specimen collection at QuestDiagnostics.com/specimencollection.

Pediatric reference ranges #1

Test	Day 1	Day 5	1 mo. - 1 yr Mean (boundary)	1 to 5 yr Mean (boundary)	6 to 10 yr Mean (boundary)	11 to 16 yr Mean (boundary)	Adult Mean (boundary)
PT (s)	13 (11.6-14.43)	12.4 (10.5-13.86)	12.3 (10.7-13.9)	11 (10.6-11.4)	11.1 (10.1-12.1)	11.2 (10.2 – 12.0)	12 (11.0-14.0)
INR	1 (0.53-1.62)	0.91 (0.53-1.48)	0.88 (0.61-1.17)	1.0 (0.96-1.04)	1.01 (0.91-1.11)	1.02 (0.93-1.10)	1.10 (1.0-1.3)
aPTT (s)	42.9 (31.3-54.5)	42.6 (25.4-59.8)	35.5 (28.1-42.9)	30 (0.24-0.36)	31 (26-36)	32 (26-37)	33 (27-40)
Fibrinogen (g/L)	2.83 (2.25-3.41)	3.12 (2.37-3.87)	2.51 (1.5-3.87)	2.76 (1.70-4.05)	2.79 (1.57-40)	3.0 (1.54-4.48)	2.78 (1.56-4.0)
Factor II (U/mL)	0.48 (0.37-0.59)	0.63 (0.48-0.78)	0.88 (0.60-1.16)	0.94 (0.71-1.16)	0.88 (0.67-1.07)	0.83 (0.61-1.04)	1.08 (0.70-1.46)
Factor V (U/mL)	0.72 (0.54-0.90)	0.95 (0.70-1.20)	0.91 (0.55-1.27)	1.03 (0.79-1.27)	0.90 (0.63-1.16)	0.77 (0.55-0.99)	1.06 (0.62-1.50)
Factor VII (U/mL)	0.66 (0.47- 0.85)	0.89 (0.62-1.16)	0.87 (0.47-1.27)	0.82 (0.55-1.16)	0.85 (0.52-1.20)	0.83 (0.58-1.15)	1.05 (0.67-1.43)
Factor VIII (U/mL)	1.00 (0.61-1.39)	0.88 (0.55-1.21)	0.73 (0.50-1.09)	0.90 (0.59-1.42)	0.95 (0.58-1.32)	0.92 (0.53-1.31)	0.99 (0.50-1.49)
vWF:Ag (U/mL)#	ND	ND	0.82 (0.53-1.53)	0.86 (0.52-1.40)	0.91 (0.58-1.45)	0.93 (0.57-1.47)	1.11 (0.65-1.82)#
vWF:Rco (U/mL)#	ND	ND	0.73 (0.51-1.50)	0.74 (0.51-1.28)	0.77 (0.46-1.38)	0.85 (0.51-1.47)	0.93 (0.56-1.50)#
Factor IX (U/mL)	0.53 (0.34-0.72)	0.53 (0.34-0.72)	0.86 (0.36-1.36)	0.73 (0.47-1.04)	0.75 (0.63-00.89)	0.82 (0.59-1.22)	1.09 (0.55-1.63)
Factor X (U/mL)	0.40 (0.26-0.54)	0.49 (0.34-0.64)	0.78 (0.38-1.18)	0.88 (0.58-1.16)	0.75 (0.55-1.01)	0.79 (0.50-0.97)	1.06 (0.70-1.52)
Factor XI (U/mL)	0.38 (0.24-0.52)	0.55 (0.39-0.71)	0.86 (0.49-1.34)	0.97 (0.56-1.50)	0.86 (0.52-1.20)	0.74 (0.50-0.97)	0.97 (0.67-1.27)
Factor XII (U/mL)	0.53 (0.33-0.73)	0.47 (0.29-0.65)	0.77 (0.39-1.15)	0.93 (0.64-1.29)	0.92 (0.60-1.40)	0.81 (0.34-1.37)	1.08 (0.52-1.64)
Factor XIII (U/mL)*	1.79 (0.67-2.82)	2.15 (0.26-3.16)	2.57 (0.99-4.78)	2.09 (0.67-3.73)	2.42 (0.31-7.85)	2.60 (0.12-6.01)	2.67 (0.47-7.94)

Quest Diagnostics has not established normal reference intervals for all factor levels for children <18 years old. The table above gives age-adjusted reference intervals for pediatric levels for comparison purposes based on published studies. Quest Diagnostics' established pediatric reference intervals may differ based on test methodology differences and population studied. The values are expressed by the upper and lower boundary encompassing approximately 95% of the population.

Factor levels are converted from the original tables, which express values as units/mL. Original tables provide values for infants at 1 day, 5 days, and 1 mo – 1 yr of age as well as for children 1-5 years, 6-10 years, and 11-16 years, as described by Monagle 2006. The published tables have been converted to the reference intervals shown.

Note: This table is to be used to gauge relative differences between age-specific intervals as methodology and reagents used in these studies may be different than what is currently used by Quest Diagnostics.

ND (no data from Appel IM 2012)

*Attard C et al, 2012; results shown for day 5 are actually day 3 results

#Appel IM et al, 2012; results shown for 1 mo-1 yr are actually 7-12 mo results, 11-16 yr are actually 11-18 yr results, and adult are actually >19 yr results

Reference:

1. Monagle P et al. Developmental haemostasis. Impact for clinical haemostasis laboratories. Thromb Haemost. 2006;95(2):362-72.
2. Appel IM et al. Age dependency of coagulation parameters during childhood and puberty. J Thromb Haemost 2012;10(11):2254-63.
3. Attard C et al. Developmental hemostasis: age-specific differences in the levels of hemostatic proteins. J Thromb Haemost 2012;11(10):1850-4.

Pediatric reference ranges #2

Test	Day 1	Day 5	1 mo. - 1 yr Mean (boundary)	1 to 5 yr Mean (boundary)	6 to 10 yr Mean (boundary)	11 to 16 yr Mean (boundary)	Adult Mean (boundary)
ATIII (%)	63 (51-75)	67 (54-80)	104 (84-124)	111 (82-139)	111 (90-131)	105 (77-132)	100 (74-126)
PS Free (%)*	25 (18-29)	34 (22-51)	64 (33-95)	68 (41-146)	68 (44-104)	65 (41-103)	86 (35-142)
PS Total (%)*	10 (6-17)	12 (4-24)	27 (5-47)	33 (15-52)	36 (18-55)	39 (20-57)	50 (18-105)
PC Activity (%)	35 (26-44)	42 (31-53)	59 (37-81)	66 (40-92)	69 (45-93)	83 (55-111)	96 (64-128)
a2M (U/mL)	ND	ND	ND	1.69 (1.14-2.23)	1.69 (1.28-2.09)	1.56 (0.98-2.12)	0.86 (0.52-1.20)
C1-Inh (U/mL)	ND	ND	ND	1.35 (0.85-1.83)	1.14 (0.88-1.54)	1.03 (0.68-1.50)	1.0 (0.71-1.31)
PAI (U/mL)	ND	ND	ND	5.42 (1.0-10.0)	6.79 (2.0-12.0)	6.07 (2.0-10.0)	3.60 (0-11.0)
Plasminogen* (U/mL)	0.38 (0.18-0.84)	0.69 (0.37-1.29)	1.01 (0.68-1.77)	1.87 (0.84-3.33)	1.82 (0.87-3.13)	1.18(0.50-2.78)	2.62 (0.57-8.14)

Quest Diagnostics has not established normal reference intervals for all factor levels for children <18 years old. The table above gives age-adjusted reference intervals for pediatric levels for comparison purposes based on published studies. Quest Diagnostics' established pediatric reference intervals may differ based on test methodology differences and population studied. The values are expressed by the upper and lower boundary encompassing approximately 95% of the population.

Note: This table is to be used to gauge relative differences between age-specific intervals as methodology and reagents used in these studies may be different than what is currently used by Quest Diagnostics.

ND (no data from Andrew 1992); ATIII, Antithrombin III (also know as Antithrombin); PS, Protein S; PC, Protein C; a2M, a2 macroglobulin; C1-Inh, C1 esterase inhibitor; HCII, heparin cofactor II; PAI-1, plasminogen activator inhibitor-1.

*Attard C et al, 2012; results shown for day 5 are actually day 3 results

Reference:

1. Attard C et al. Developmental hemostasis: age-specific differences in the levels of hemostatic proteins. J Thromb Haemost 2012;11(10):1850-4.
2. Andrew et al. Maturation of the Hemostatic System During Childhood. Blood 1992;80(8):1998-2005
3. Monagle P et al. Developmental haemostasis. Impact for clinical haemostasis laboratories. Thromb Haemost. 2006;95(2):362-72.

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Additionally, you may contact our Quest Diagnostics Nichols Institute directly:
Quest Diagnostics Nichols Institute – Chantilly, VA **1.800.336.3718**
Quest Diagnostics Nichols Institute – San Juan Capistrano, CA **1.800.642.4657**

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