Quest Diagnostics®

Bleeding and Thrombosis

Better answers from high-quality testing

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 (1.866.697.8378) or by contacting our locations directly.

Quest Diagnostics:
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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	2.0 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 1.5 mL minimum
Partial Thromboplastin Time, Activated III	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 (4) 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 (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.5-mL tubes minimum
Prolonged aPTT Thrombotic Evaluation[1]	19648[a]	Always includes: PTT-LA, DRVVT Screen, Interpretation. Possible reflexes: Hexagonal Phase Confirm, Thrombin Time, DRVVT Confirm, DRVVT Mixing Study, Fibrinogen, PT	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 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 (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 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 (2) 1-mL frozen platelet-poor plasma tubes (3.2% sodium citrate [light blue-top tube]); two (2) 0.5-mL tubes minimum

[a] Chantilly only.

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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[2]	5168		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
von Willebrand Disease Panel without Collagen Binding Assay (CBA)[2]	19790	aPTT; Factor VIII Activity, Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor; von Willebrand Antigen, Multimeric Analysis; Interpretation	Four (4) 1-mL tubes frozen plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.75-mL tubes, minimum
von Willebrand Disease Panel with Collagen Binding Assay (CBA)[2]	15540	aPTT, Factor VIII Activity Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor; von Willebrand Factor Collagen Binding Assay; von Willebrand Antigen Multimeric Analysis	Four (4) 1-mL tubes frozen plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.75-mL tubes, minimum
von Willebrand Comprehensive Panel 2 with Consultation[2]	19681X[a]	aPTT; Factor VIII Activity Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor; von Willebrand Factor Collagen Binding Assay; von Willebrand Multimeric Analysis; Interpretation; Coagulation Consultative Report	1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL 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 (3) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); three (3) 0.75 mL tubes minimum
von Willebrand Disease Gene Sequencing	36494		5 mL whole blood collected in EDTA (lavender-top), ACD (yellow-top), sodium heparin (green-top), or sodium heparin (royal blue-top) tube

Factor assays and inhibitors

Test name	Test codes	Panel components	Specimen requirements
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 II Activity, Clotting	331		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum

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Factor assays and inhibitors (continued)

Test name	Test codes	Panel components	Specimen requirements
Factor V Activity and Human Inhibitor	17844	If FV Activity ≤ 20%, then FV Inhibitor (Bethesda Assay) will be performed	Two (2) 2-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes minimum
Factor V Activity, Clotting	344		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Factor VII Activity, Clotting	346		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
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	Two (2) 2-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes minimum
Factor IX Activity and Human Inhibitor	17845	If FIX Activity ≤20%, then FIX Inhibitor (Bethesda Assay) performed	Two (2) 2-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes 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 IX Antigen	91053		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL 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, Clotting	360		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) 2-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes 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

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Anticoagulant/Antiplatelet therapy

Test name	Test codes	Panel components	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	94223		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
AccuType® CP, Clopidogrel *CYP2C19* Genotype[a]	16924 (16925 NY)		4 mL whole blood (EDTA [lavender-top tube]); 2 mL whole blood minimum • 1 mL saliva minimum
Cardio IQ® CYP2C19 Genotype[a]	90668		4 mL whole blood (EDTA [lavender-top tube]); 2 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	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
AspirinWorks® 11-Dehydrothromboxane B2 (11-dhTXB2) with Creatinine	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 (2) 1-mL tubes frozen serum, two 0.5-mL tubes minimum
Heparin-Induced Thrombocytopenia Panel[3]	14874	Serotonin Release Assay (SRA), Unfractionated Heparin; Heparin-Induced Platelet Antibody	Two (2) 1-mL tubes frozen serum (red-top [no gel] tube), two (2) 0.9-mL tubes 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
Platelet Antibody Screen, Serum	11484	GPIIb/IIIa (Cell-1); GPIIb/IIIa (Cell-2); GPIa/IIa (Cell-1); GPIa/IIa (Cell-2); GPIb/IX; GPIV; HLA Class I	1.5 mL frozen serum (red-top [no gel] tube); 0.5 mL minimum

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[a]Chantilly only.

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HIT, TTP, and platelet studies (continued)

Test name	Test codes	Panel components	Specimen requirements
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)	458		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Fibrinogen Comprehensive Panel with Consultation	19903[a]	Fibrinogen Activity, Clauss; Thrombin Clotting Time with Reflex to Mixing Study; Reptilase Clotting Time; Fibrinogen Antigen, Nephelometry; Coagulation Consult	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light-blue top tube]); four (4) 0.5-mL tubes minimum
Fibrinogen Comprehensive Panel without Consultation	14458	Fibrinogen Activity, Clauss; Thrombin Clotting Time with Reflex to Mixing Study; Reptilase Clotting Time; Fibrinogen Antigen, Nephelometry	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light-blue top tube]); four (4) 0.5-mL tubes 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	Five (5) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); five (5) 0.8-mL tubes 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 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 Consultation	19685	D-Dimer, Fibrin Monomer, Prothrombin Fragment 1.2, Thrombin-Antithrombin (TAT) Complex; Coagulation Consult	Three (3) 2-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light-blue top tube]; three (3) 1-mL tubes minimum
Thrombotic Marker Panel	11345X	D-Dimer, Fibrin Monomer, Prothrombin Fragment 1.2, Thrombin-Antithrombin (TAT) Complex	Three (3) 2-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light-blue top tube]; three (3) 1-mL tubes minimum

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 (2) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 0.5-mL tubes minimum
Antithrombin III Activity with Reflex to Antithrombin III Antigen	8267	If ATIII Activity decreased, ATIII Antigen will be performed	Two (2) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 0.5-mL tubes minimum
Antithrombin III Antigen	5158		1 mL frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
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

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

Test name	Test codes	Panel components	Specimen requirements
Methylenetetrahydrofolate Reductase (MTHFR), DNA Mutation Analysis[5]	17911		5 mL room-temperature whole blood (EDTA [lavender-top tube]); 3 mL minimum
Prolonged aPTT Thrombotic Evaluation[6]	19648[a]	Always includes: PTT-LA, DRVT Screen, Interpretation. Possible reflexes: Hexagonal Phase Confirm, Thrombin Time, DRVVT Confirm, DRVVT Mixing Study, Fibrinogen, PT	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.5-mL tubes 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 (2) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 0.5-mL tubes minimum
Protein C Activity with Reflex to Protein C Antigen	8754	If Protein C Activity is decreased, Protein C Antigen will be performed	Two (2) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 0.5-mL tubes minimum
Protein C and Protein S, Functional	39457	Protein C Activity, Protein S Activity	Two (2) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 0.5-mL tubes 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) 2-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes 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 decreased, Protein S Antigen Total and Free will be performed	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
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

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

Test name	Test codes	Panel components	Specimen requirements
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 (3) 1-mL tubes frozen plasma (3.2% sodium citrate [light blue-top tube]) and 5 mL whole blood (EDTA [lavender-top tube]); three (3) 0.5-mL tubes plasma and 5 mL whole blood minimum
Venous Thrombosis Hypercoagulability Panel w/Reflex (Warfarin Patient)	11472	Activated Protein C Resistance with Reflex to Factor V (Leiden) Mutation; Prothrombin (Factor II) 20210G→A Mutation Analysis; Antithrombin III Activity; Factor VIII Activity, Clotting; Hexagonal Phase Confirm; dRVVT Screen with Reflex to dRVVT Confirm and dRVVT 1:1 Mix; Cardiolipin Antibodies (IgG, IgM); Beta-2-Glycoprotein I Antibodies (IgG, IgM) If Activated Protein C-Resistance is positive, then Factor V (Leiden) Mutation Analysis will be performed. If dRVVT Screen is prolonged, then dRVVT Confirm will be performed. If dRVVT Confirm is positive, then dRVVT 1:1 Mixing Study will be performed	5 mL whole blood (EDTA [lavender-top tube]) and six (6) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tubes]); six (6) 0.5-mL frozen platelet-poor plasma and 3 mL whole blood minimum
Venous Thrombosis Hypercoagulability Panel w/Reflex	11475	Activated Protein C Resistance with Reflex to Factor V (Leiden) Mutation; Prothrombin (Factor II) 20210G→A Mutation Analysis; Protein C Activity; Protein S Antigen, Total and Free; Antithrombin III Activity; Factor VIII Activity, Clotting; Lupus Anticoagulant Evaluation with Reflex (PTT-LA and dRVVT with Reflex Confirmations); Cardiolipin Antibodies (IgG, IgM); Beta-2-Glycoprotein I Antibodies (IgG, IgM) If Activated Protein C-Resistance is positive, then Factor V (Leiden) Mutation Analysis will be performed If PTT-LA Screen is prolonged, then Hexagonal Phase Confirmation will be performed. If Hexagonal Phase Confirmation is positive or weakly positive, then Thrombin Clotting Time will be performed. If dRVVT Screen is prolonged then dRVVT Confirm will be performed. If dRVVT Confirm is positive, then dRVVT 1:1 Mixing Study will be performed	5 mL whole blood (EDTA [lavender-top tube]) and six (6) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tubes]); six (6) 0.5-mL tubes frozen platelet-poor plasma and 3 mL whole blood minimum

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

Test name	Test codes	Panel components	Specimen requirements
Venous Thrombosis Hypercoag Panel w/Reflex, Consultation (Warfarin Patient)	19655	Activated Protein C Resistance with Reflex to Factor V (Leiden) Mutation; Prothrombin (Factor II) 20210G→A Mutation Analysis; Antithrombin III Activity; Homocysteine; Cardiolipin Antibodies (IgG, IgM); Factor VIII Activity, Clotting; Beta-2-Glycoprotein I Antibodies (IgG, IgM); Hexagonal Phase Confirmation; dRVVT Screen with Reflex to dRVVT Confirm and dRVVT 1:1 Mix; Coagulation Consultation If Activated Protein C-Resistance is positive, then Factor V (Leiden) Mutation Analysis will be performed. If dRVVT Screen is prolonged, then dRVVT Confirm will be performed. If dRVVT Confirm is positive, then dRVVT 1:1 Mixing Study will be performed	5 mL whole blood ([EDTA (lavender-top tube]) and six (6) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tubes]) and 1 mL serum; six (6) 0.5-mL tubes minimum frozen platelet-poor plasma, 0.6 mL serum, and 3 mL whole blood minimum
Venous Thrombosis Hypercoagulability Panel w/Reflex and Consultation	19656	Activated Protein C Resistance with Reflex to Factor V (Leiden) Mutation; Prothrombin (Factor II) 20210G→A Mutation Analysis; Protein C Activity; Protein S Antigen, Free and Protein S Antigen, Total; Antithrombin III Activity; Homocysteine; Cardiolipin Antibodies (IgG, IgM); Factor VIII Activity, Clotting; Beta-2-Glycoprotein I Antibodies (IgG, IgM); Lupus Anticoagulant Evaluation with Reflex (PTT-LA and dRVVT with Reflex Confirmations); Coagulation Consultation If Activated Protein C-Resistance is positive, then Factor V (Leiden) Mutation Analysis will be performed. If PTT-LA Screen is prolonged, then Hexagonal Phase Confirmation will be performed. If Hexagonal Phase Confirmation is positive or weakly positive, then Thrombin Clotting Time will be performed. If dRVVT Screen is prolonged then dRVVT Confirm will be performed. If dRVVT Confirm is positive, then dRVVT 1:1 Mixing Study will be performed	5 mL whole blood (EDTA [lavender-top tube]) and six (6) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tubes and 1 mL serum; six (6) 0.5-mL tubes minimum frozen platelet-poor plasma, 0.5 mL serum and 3 mL whole blood minimum

Antiphospholipid antibody and lupus anticoagulant

Test name	Test codes	Panel components	Specimen requirements
Antiphospholipid Antibody Panel	14890	Beta-2-Glycoprotein I Antibodies (IgG, IgA, IgM); Phosphatidylserine/Prothrombin (PS/PT) Antibodies (IgG, IgM); Cardiolipin Antibodies (IgA, IgG, IgM)	Two (2) 1-mL tubes of plasma (3.2% sodium citrate, [light blue-top tubes]); Two (2) 0.5-mL minimum
Antiphospholipid Syndrome Diagnostic Panel	19872	Cardiolipin and Beta-2-Glycoprotein I Antibodies (IgG, IgA, IgM); Lupus Anticoagulant Evaluation with Reflex	Three (3) 1-mL tubes platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL minimum

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Antiphospholipid antibody and lupus anticoagulant (continued)

Test name	Test codes	Panel components	Specimen requirements
Beta-2-Glycoprotein I Antibodies (IgA, IgG, IgM)	30340	Beta-2-Glycoprotein I Antibodies (IgA) TC 36552; Beta-2-Glycoprotein I Antibodies (IgG) TC 36554; Beta-2-Glycoprotein I Antibodies (IgM) TC 36553	3 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 1.5 mL minimum
Beta-2-Glycoprotein I Antibodies (IgG, IgM)	91244	Beta-2-Glycoprotein I Antibodies (IgG) TC 36554; Beta-2-Glycoprotein I Antibodies (IgM) TC 36553	2 mL room-temperature plasma (3.2% sodium citrate [light blue-top]); 1 mL minimum
Cardiolipin Antibodies (IgA, IgG, IgM)	7352	Cardiolipin Antibody (IgA) TC 4661; Cardiolipin Antibody (IgG) TC 4662; Cardiolipin Antibody (IgM) TC 4663	1 mL room-temperature plasma (3.2% sodium citrate [light blue-top tube]); 0.5 mL minimum
Cardiolipin Antibodies (IgG, IgM)	36333	Cardiolipin Antibody (IgG) TC 4662; Cardiolipin Antibody (IgM) TC 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	Two (2) 1.5-mL frozen tubes (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes minimum
Lupus Anticoagulant and Antiphospholipid Confirmatory Panel, non-Coumadin	19652	Cardiolipin and B2GPI Antibodies (IgG, IgM); Prolonged aPTT Thrombotic Evaluation	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.5-mL tubes minimum
Lupus Anticoagulant and Antiphospholipid Confirmatory Panel non-Coumadin, with consult	19654[a]	Prolonged aPTT Thrombotic Evaluation; PTT-LA with Reflex to Hexagonal Phase Confirmation; dRVVT Screen with Reflex to dRVVT Confirm and dRVVT 1:1 Mix; Cardiolipin Antibodies (IgG, IgM); Beta-2-Glycoprotein I Antibodies (IgG, IgM); Coagulation Consultation	Six (6) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); six (6) 0.5-mL tubes minimum
Lupus Anticoagulant and Antiphospholipid Confirmatory Panel on Coumadin	19672	Cardiolipin and B2GPI Antibodies (IgG, IgM); Hexagonal Phase Confirm; dRVVT Screen wtih Reflex to dRVVT Confirm and dRVVT 1:1 Mix; PT with INR, Thrombin Clotting Time	Six (6) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); six (6) 0.5-mL tubes minimum
Lupus Anticoagulant and Antiphospholipid Confirmatory Panel on Coumadin, with consult	19674[a]	Prothrombin Time with INR; Thrombin Clotting Time; Cardiolipin Antibodies (IgG, IgM); Beta-2-Glycoprotein I Antibodies (IgG, IgM); Hexagonal Phase Confirmation; dRVVT Screen with Reflex to dRVVT Confirm and dRVVT 1:1 Mix; Coagulation Consultation	Six (6) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tubes]); six (6) 0.5-mL tubes minimum
Phosphatidylserine/Prothrombin (PS/PT) Antibodies (IgG, IgM)	11447	Phosphatidylserine/Prothrombin (PS/PT) IgG 1143; Phosphatidylserine/Prothrombin (PS/PT) IgM 1146	1 mL platelet-poor plasma (3.2% sodium citrate [light blue-top tube])

Continued ▸

[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.

Antiphospholipid antibody and lupus anticoagulant (continued)

Test name	Test codes	Panel components	Specimen requirements
Prothrombin Antibody (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

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 (3) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes minimum
Menorrhagia Screen with Consultation	19651[a]	aPTT; PT with INR; Factor XI Activity; von Willebrand Factor Antigen; Ristocetin Cofactor Activity; Factor VIII Activity; Coagulation Consultative Report	Three (3) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); two (2) 1-mL tubes minimum
Recurrent Miscarriage/Coagulation Panel with Reflex (without Consultation)	11469	Lupus Anticoagulant Evaluation with Reflex (PTT-LA and dRVVT with Reflex Confirmations); Cardiolipin and Beta-2-Glycoprotein I Antibodies (IgG, IgA, IgM); Protein C Activity; Protein S Antigen, Free; Antithrombin III Activity; Phosphatidylserine/Prothrombin Antibodies (IgG, IgM); Prothrombin (Factor II) 20210G→A Mutation Analysis; Factor V (Leiden) Mutation Analysis	5 mL whole blood collected in an EDTA (lavender-top) tube and Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]) Minimum: 3 mL EDTA whole blood; four (4) 0.5-mL tubes platelet-poor plasma (sodium citrate)
Recurrent Miscarriage Evaluation/Coagulation Panel with Consultation	19671[a]	Lupus Anticoagulant Evaluation with Reflex (PTT-LA and dRVVT with Reflexes); Cardiolipin and Beta-2-Glycoprotein I Antibodies (IgG, IgA, IgM); Protein C Activity; Protein S Antigen, Free; Antithrombin III Activity; Phosphatidylserine/Prothrombin Antibodies (IgG, IgM); Prothrombin (Factor II) 20210G > A Mutation Analysis; Factor V (Leiden) Mutation Analysis; Coagulation Consultative Report	5 mL whole blood collected in an EDTA (lavender-top) tube and Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); and 3 mL frozen serum collected in a red-top tube (no gel) Minimum: 3 mL EDTA whole blood, four (4) 0.5-mL tubes platelet-poor plasma (sodium citrate), and 0.5 mL serum
von Willebrand Disease Panel without Collagen Binding Assay (CBA)	19790	aPTT; Factor VIII Activity, Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor Activity; von Willebrand Factor Multimeric Analysis; Interpretation	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.75-mL tubes minimum
von Willebrand Disease Panel with Collagen Binding Assay (CBA)[2]	15540	aPTT; Factor VIII Activity Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor Activity; von Willebrand Factor Collagen Binding Assay; von Willebrand Factor Multimeric Analysis; Interpretation	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.75-mL tubes minimum

Continued ▸

[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.

Test name	Test codes	Panel components	Specimen requirements
von Willebrand Comprehensive Panel 2 with Consultation[2]	19681X[a]	aPTT; Factor VIII Activity Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor Activity; von Willebrand Factor Collagen Binding ASSAY; von Willebrand Factor Multimeric Analysis; Interpretation; Coagulation Consultative Report	Four (4) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); four (4) 0.75-mL tubes minimum
von Willebrand Screen	90271	aPTT; Factor VIII Activity, Clotting; von Willebrand Factor Antigen; Ristocetin Cofactor	Three (3) 1-mL tubes frozen platelet-poor plasma (3.2% sodium citrate [light blue-top tube]); three (3) 0.5-mL tubes minimum

Enhanced reporting

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

[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.

[6]Tests only available in Chantilly, VA.

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).

[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.

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)[a]	Thrombin Inhibitors[a] (ie, Dabigatran, Argatroban)	Factor Xa Inhibitors[a] (ie, Rivaroxaban, Apixaban, Edoxaban)
aPTT	763	Prolonged	Prolonged	Prolonged	Prolonged
PT/INR	8847	Prolonged	Little to no effect[b]	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[b] *(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[b]	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[c]	May falsely increase	No effect
Antithrombin III Antigen	5158	No effect	No effect to decrease[c]	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 end-point[a]	No effect
Lupus Anticoagulant Evaluation with Reflex; *(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

[a]Therapeutic levels. Potential interference dependent on drug concentration.
[b]Reagent contains a heparin neutralizer.
[c]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	For assessment
Factor II	331	Factor II Activity, Clotting	Bleeding risk
	17909	Factor II Prothrombin 20210G>A Mutation Analysis	Thrombotic risk
Factor V	344	Factor V Activity, Clotting	Bleeding risk
	17900	Factor V (Leiden) Mutation Analysis	Thrombotic risk
Factor VIII	347	Factor VIII Activity, Clotting	Bleeding/thrombotic risk
	16049	Factor VIII Activity, Chromogenic	Bleeding/thrombotic risk in patients with lupus anticoagulants or other inhibitors
	40083	Factor VIII Inhibitor Panel	Bleeding risk
	14461	Factor XIII, Functional	Common clerical error, intended for bleeding risk
Factor X	359	Factor X Activity, Clotting	Bleeding risk
	10663	Factor X Activity, Chromogenic	Warfarin monitoring for patients with lupus anticoagulant
	30292	Heparin Anti Xa	Monitoring patients on heparin or LMWH; not appropriate for anti-Xa medictions (direct oral anticoagulants such as apixaban, rivaroxaban, etc. see below)
Anti Xa (Xa Inhibition)	16103	Fondaparinux Sodium (Xa Inhibition)	Specific anticoagulant monitoring
	90981	Rivaroxaban	Specific anticoagulant monitoring
	94223	Apixaban	Specific anticoagulant monitoring
	30292	Heparin Anti-Xa	Specific anticoagulant monitoring
Ristocetin	4459	Ristocetin Cofactor Activity	Bleeding risk due to von Willebrand Disease
	Test not offered	Ristocetin-induced platelet aggregation	Bleeding risk due to Type 2B or Platelet Type von Willebrand disease, not offered due to short specimen stability
Serotonin	14627	Serotonin Release Assay (SRA), Unfractionated Heparin	Thrombotic risk
	818	Serotonin, Blood	Presence of carcinoid tumors of the enterochromaffin cell, common clerical error

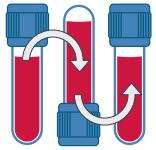
Specimen collection instructions

Preparing platelet-poor plasma for coagulation testing

1

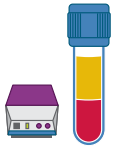
Fill Vacutainer to the minimum required fill line.

2



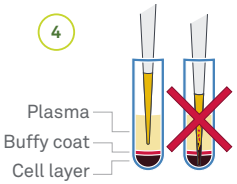
Immediately after collection, mix specimen by gentle inversion four times.

3



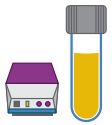
Centrifuge at 1500 x g for 15 minutes.

4



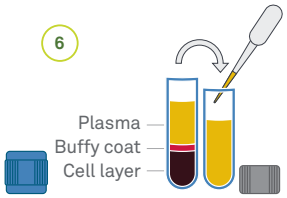
Remove plasma without disturbing the buffy coat or cell layer at the bottom of the tube.

5



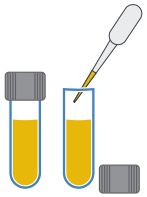
Cap and centrifuge plasma at 1500 x g for 15 minutes.

6



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

7

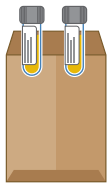


Transfer plasma to plastic storage tubes. Ideally PPP platelet count should not exceed 10,000/uL.

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 - 5 yr Mean (boundary)	6 - 10 yr Mean (boundary)	11 - 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)[b]	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)[b]
vWF:Rco (U/mL)[b]	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)[b]
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)[a]	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)

ND (no data from Appel IM 2012)[1]

[a]Attard C et al, 2012; results shown for day 5 are actually day 3 results[2]

[b]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[1]

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.

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.[3] The published tables have been converted to the reference intervals shown.

Reference:

1. Appel IM et al. Age dependency of coagulation parameters during childhood and puberty. *J Thromb Haemost.* 2012;10(11):2254-63. doi:10.1111/j.1538-7836.2012.04905.x
2. Attard C et al. Developmental hemostasis: age-specific differences in the levels of hemostatic proteins. [published correction appears in *J Thromb Haemost* 2019;17(11):1995. doi:10.1111/jth.14655]. *J Thromb Haemost* 2013;11(10):1850-1854. doi:10.1111/jth.12372.
3. Monagle P et al. Developmental haemostasis. Impact for clinical haemostasis laboratories. *Thromb Haemost*. 2006;95(2):362-372. doi:10.1160/TH05-01-0047.

Pediatric reference ranges #2

Test	Day 1	Day 5	1 mo. - 1 yr Mean (boundary)	1 - 5 yr Mean (boundary)	6 - 10 yr Mean (boundary)	11 - 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)

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. ND, no data from Andrew.[1]

[a]Results shown for day 5 are actually day 3 results.[2]

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.

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.[3] The published tables have been converted to the reference intervals shown.

Reference:

1. Andrew M et al. Maturation of the Hemostatic System During Childhood. *Blood.* 1992;80(8):1998-2005. doi:10.1182/blood.V80.8.1998.1998.
2. Attard C et al. Developmental hemostasis: age-specific differences in the levels of hemostatic proteins. [published correction appears in *J Thromb Haemost* 2019;17(11):1995. doi:10.1111/jth.14655]. *J Thromb Haemost* 2013;11(10):1850-1854. doi:10.1111/jth.12372.
3. Monagle P et al. Developmental haemostasis. Impact for clinical haemostasis laboratories. *Thromb Haemost*. 2006;95(2):362-372. doi:10.1160/TH05-01-0047.

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