Test Definition: ALUPP

Lupus Anticoagulant Profile, Plasma

Overview

Useful For

Confirming or excluding the presence of lupus anticoagulant (LA), distinguishing LA from specific coagulation factor inhibitors and nonspecific inhibitors

Investigating a prolonged activated thromboplastin time, especially when combined with other coagulation studies

This test is **not useful for** the detection of antiphospholipid antibodies that do not affect coagulation tests. We recommend separate testing for serum phospholipid (cardiolipin), IgG and IgM (CLPMG) and beta-2 glycoprotein 1, IgG and IgM (B2GMG).

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
ALUPI	Lupus Anticoagulant Tech Interp	No	Yes
PTSC	Prothrombin Time (PT), P	Yes, (order PTTP)	Yes
APTSC	Activated Partial Thrombopl Time, P	Yes, (order APTTP)	Yes
DRV1	Dilute Russells Viper Venom Time, P	Yes, (order DRVI1)	Yes

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
DIMER	D-Dimer, P	Yes, (order DDITT)	No
F8IS	Coag Factor VIII Assay Inhib Scrn,P	No	No
FACTV	Coag Factor V Assay, P	Yes	No
F_7	Coag Factor VII Assay, P	Yes	No
TTSC	Thrombin Time (Bovine), P	Yes	No
F_9	Coag Factor IX Assay, P	Yes	No
F_10	Coag Factor X Assay, P	Yes	No
F_11	Coag Factor XI Assay, P	Yes	No
F_12	Coag Factor XII Assay, P	Yes	No
F8A	Coag Factor VIII Activity Assay, P	Yes	No
RTSC	Reptilase Time, P	Yes	No
F_2	Coag Factor II Assay, P	Yes	No
CLFIB	Fibrinogen, Clauss, P	Yes, (order FIBTP)	No
SOLFM	Soluble Fibrin Monomer	No	No

PNP	Platelet Neutralization Procedure	No	No
PTMSC	PT Mix 1:1	No	No
APMSC	APTT Mix 1:1	No	No
DRV2	DRVVT Mix	No	No
DRV3	DRVVT Confirmation	No	No
ALUPO	Lupus Anticoagulant Interp	No	No
RIST	Ristocetin Cofactor, P	No	No
F5_IS	Factor V Inhib Scrn	No	No
VWFMP	von Willebrand Factor Multimer, P	Yes, (order VWFMS)	No
VWAG	von Willebrand Factor Ag, P	Yes	No
VWACT	von Willebrand Factor Activity, P	Yes	No
CH9	Chromogenic FIX, P	Yes	No
5BETH	FV Bethesda Units, P	No	No
F9_IS	Factor IX Inhib Scrn	No	No
8BETH	FVIII Bethesda Units, P	No	No
9BETH	FIX Bethesda Units, P	No	No
CHF8	Chromogenic FVIII, P	Yes	No
HEXLA	HEX LA, P	No	No
PTFIB	PT-Fibrinogen, P	No	No

Testing Algorithm

Initial testing includes prothrombin time (PT), activated partial thromboplastin time (aPTT), and dilute Russell's viper venom time (dRVVT).

If the PT, aPTT, and dRVVT are normal, a computer-generated interpretive comment indicating no evidence of a lupus anticoagulant (LA) will be provided.

If PT is greater than 13.9 seconds, PT mix will be performed at an additional charge.

If aPTT is greater than or equal to 38 seconds, aPTT mix will be performed at an additional charge.

If PT, aPTT, or dRVVT are prolonged, thrombin time (TT) will be performed at an additional charge.

If aPTT mix is greater than or equal to 38 seconds and thrombin time is less than 35.0 seconds (no evidence of heparin), platelet neutralization procedure will be performed at an additional charge.

If dRVVT ratio is greater than or equal to 1.20, dRVVT mix and dRVVT confirmation will be performed at an additional charge.

If TT is greater than or equal to 25.0 seconds, reptilase will be performed at an additional charge.

If appropriate, coagulation factor assays, fibrinogen, D-dimer, hexagonal LA, and soluble fibrin monomer will be performed, at an additional charge, to clarify a significant abnormality in the screen test results.

If the factor VIII, IX or V result is below the normal range, the factor inhibitor screen may be performed along with the Bethesda titering assay, if indicated, at an additional charge.

If any test results are abnormal, all results will be reviewed by a coagulation consultant and a lupus anticoagulant interpretation will be provided.

For more information see Lupus Anticoagulant Profile Testing Algorithm.

Special Instructions

- Coagulation Guidelines for Specimen Handling and Processing
- Coagulation Patient Information
- Lupus Anticoagulant Profile Testing Algorithm
- Coagulation Profile Comparison

Method Name

ALUPI: Technical Interpretation
PTSC, APTSC, DRV1: Optical Clot-Based

NY State Available

Yes

Specimen

Specimen Type

Plasma Na Cit

Ordering Guidance

Multiple coagulation profile tests are available. See Coagulation Profile Comparison for testing that is performed with each profile.

Shipping Instructions

Send the aliquots in the same shipping container.

Necessary Information

Note if patient is currently receiving anticoagulant (eg, heparin, Coumadin [warfarin]) treatment.

Specimen Required

Patient Preparation:

1. If possible, patient should not be receiving anticoagulant treatment (eg, warfarin, heparin): If not possible for medical reasons, note on request.

a. If medically feasible, for 4 to 6 hours before specimen collection, do not administer intravenous heparin.
b. If medically feasible, for 10 to 14 days before specimen collection, do not administer subcutaneous heparin or Coumadin (warfarin).
2. Patient should not be receiving fibrinolytic agents (streptokinase, urokinase, tissue plasminogen activator: tPA).
3. If patient has been recently transfused, it is best to perform this study pretransfusion, if possible.
Specimen Type: Platelet-poor plasma
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Light-blue top (citrate)
Submission Container/Tube: Plastic vials
Specimen Volume: 4 mL in 4 plastic vials each containing 1 mL
Collection Instructions:
1. Specimen must be collected prior to factor replacement therapy.
2. For complete instructions, see Coagulation Guidelines for Specimen Handling and Processing.
3. Centrifuge, transfer all plasma into a plastic vial, and centrifuge plasma again.
4. Aliquot plasma (1-2 mL per aliquot) into 4 separate plastic vials, leaving 0.25 mL in the bottom of centrifuged vial.
5. Freeze plasma immediately (no longer than 4 hours after collection) at -20 degrees C or, ideally, -40 degrees C or below.
Additional Information:
1. Double-centrifuged specimen is critical for accurate results as platelet contamination may cause spurious results.
2. Each coagulation assay requested should have its own vial.

Forms
1. Coagulation Patient Information (T675)
2. If not ordering electronically, complete, print, and send a Coagulation Test Request (T753) with the specimen.

Specimen Minimum Volume
3 mL in 3 plastic vials each containing 1 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Na Cit	Frozen	14 days	

Clinical & Interpretive

Clinical Information
Lupus anticoagulant (LA) is an antibody to negatively charged phospholipid that interferes with phospholipid-dependent

coagulation tests.

LA is found in, but not limited to, patients with systemic lupus erythematosus; LA is associated with other autoimmune disorders and collagen vascular disease and occurs in response to medications or certain infections (eg, respiratory tract infections in children) and in individuals with no obvious underlying disease.

Lupus anticoagulant has been associated with arterial and venous thrombosis and fetal loss. Individuals with thrombocytopenia or factor II deficiency associated with LA may be at risk for bleeding.

Reference Values
An interpretive report will be provided.

Interpretation
An interpretive report will be provided when testing is complete.

Cautions
Treatment with heparin causes false-positive results of in vitro coagulation testing for lupus anticoagulant.

Coumadin (warfarin) treatment may impair ability to detect the more subtle varieties of lupus-like anticoagulants.

Clinical Reference
1. Arnout J, Vermylen J. Current status and implications of autoimmune antiphospholipid antibodies in relation to thrombotic disease. J Thromb Haemost. 2003;1(5):931-942
2. Levin JS, Branch DW, Rauch J. The antiphospholipid syndrome. New Engl J Med. 2002;346(10):752-763
3. Proven A, Bartlett RP, Moder KG et al. Clinical importance of positive tests for lupus anticoagulant and anticardiolipin antibodies. Mayo Clin Proc. 2004;79(4):467-475
4. Kitches CS, Kessler CM, Konkle BA, et al. Consultative Hemostasis and Thrombosis. 4th ed. Elsevier; 2019:374-395

Performance

Method Description
Prothrombin Time:
The prothrombin time (PT) assay is performed on the Instrumentation Laboratory ACL TOP. Patient plasma is incubated and combined with a PT reagent containing recombinant human tissue factor, synthetic phospholipids, calcium chloride, polybrene, and buffer. The tissue thromboplastin-factor VII/VIIa complex activates factor X. Activated factor X (factor Xa) forms a complex with factor Va, calcium, and phospholipid to activate factor II (prothrombin) to thrombin. Thrombin then acts on fibrinogen (factor I) to form fibrin which clots, the time to clot formation is measured optically using a wavelength of 671 nm providing the assay endpoint (the "prothrombin time").(Package insert: HemosIL RecombiPlasTin 2G. Instrumentation Laboratory Company; R0, 03/2019)

Activated Partial Thromboplastin Time:
The activated partial thromboplastin time (aPTT) assay is performed on the Instrumentation Laboratory ACL TOP. Patient plasma is combined and incubated with an aPTT reagent containing phospholipid, a negatively charged contact factor activator, and buffer. After a specified incubation time, calcium is added to trigger the coagulation process in the

mixture. Subsequently, the time to clot formation is measured optically using a wavelength of 671 nm. Mixing studies (see APMSC / Activated Partial Thromboplastin Time (APTT) Mix 1:1, Plasma) using normal pooled plasma are performed in the Special Coagulation Laboratory on samples with a prolonged aPTT, to assist in discriminating between factor deficiency states and coagulation inhibitors, unless further testing is not indicated.(Package insert: HemosIL SynthASil. Instrumentation Laboratory Company; R11, 06/2017)

Dilute Russell's Viper Venom Time:
The dilute Russell's viper venom time (dRVVT) screening assay is performed on the Instrumentation Laboratory ACL TOP. Patient plasma is incubated for a specified time, and then combined with a dRVVT screening reagent containing Russell's viper venom, phospholipids, heparin neutralizing agents, calcium, buffers and stabilizers to trigger the coagulation process. Subsequently, the time to clot formation is measured optically using a wavelength of 671 nm. The patient dRVVT screening clotting time is normalized by dividing the patient result by the mean DRVVT screening clotting time of normal pooled plasma to yield a ratio (dRVVT screen ratio).(Package insert: LA CHECK DRVVT. Precision Biologic; R14, 03/2012)

Technical Interpretation:
If the prothrombin time, activated partial thromboplastin time, and dilute Russell viper venom time are normal, a computer-generated interpretive comment will be provided indicating no evidence of a lupus anticoagulant.

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
3 to 5 days

Specimen Retention Time
7 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
See Individual Test IDs

CPT Code Information

85610
85730
85613
85390
85130 (if appropriate)
85130 (if appropriate)
85210 (if appropriate)
85220 (if appropriate)
85230 (if appropriate)
85240 (if appropriate)
85245 (if appropriate)
85246 (if appropriate)
85247 (if appropriate)
85250 (if appropriate)
85260 (if appropriate)
85270 (if appropriate)
85280 (if appropriate)
85335 (if appropriate)
85335 (if appropriate)
85335 (if appropriate)
85366 (if appropriate)
85379 (if appropriate)
85384 (if appropriate)
85385 (if appropriate)
85390-26 (if appropriate)
85397 (if appropriate)
85597 (if appropriate)
85598 (if appropriate)
85611 (if appropriate)
85613 (if appropriate)
85613 (if appropriate)
85635 (if appropriate)
85670 (if appropriate)
85732 (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
ALUPP	Lupus Anticoagulant Prof	75881-3

Result ID	Test Result Name	Result LOINC® Value
APTSC	Activated Partial Thrombopl Time, P	14979-9
ALUPI	Lupus Anticoagulant Tech Interp	75882-1
INRSC	INR	6301-6
PTSEC	Prothrombin Time (PT), P	5902-2
RVR1	DRVVT Screen Ratio	15359-3