Test Definition: APIXA

Apixaban, Anti-Xa, Plasma

Overview

Useful For

Measuring apixaban concentration in selected clinical situations (eg, renal insufficiency, assessment of compliance, periprocedural measurement of drug concentration, suspected overdose, advanced age, and extremes of body weight)

Special Instructions

- Coagulation Guidelines for Specimen Handling and Processing

Method Name

Chromogenic

NY State Available

Yes

Specimen

Specimen Type

Plasma Na Cit

Ordering Guidance

This assay is not indicated for monitoring low-molecular-weight heparin (LMWH) or unfractionated heparin (UFH) concentrations. The presence of UFH and LMWH will cause the apixaban anti-Xa level to be falsely elevated.

This assay is optimized to measure apixaban concentration in presence of coagulation factor Xa recombinant, inactivated-zhzo (andexanet alfa, Andexxa).

Specimen Required

Specimen Type: Platelet-poor plasma
Collection Container/Tube: Light-blue top (3.2% sodium citrate)
Submission Container/Tube: 13-mm x 75-mm, 5-mL, plastic vial (polypropylene preferred)
Specimen Volume: 1 mL Platelet-poor plasma
Collection Instructions:
1. Specimen should be collected 2 to 4 hours (peak) after a dose or just prior (trough) to the next dose for apixaban concentrations.
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 into a plastic vial leaving 0.25 mL in the bottom of centrifuged vial.
5. Immediately freeze plasma (no longer than 4 hours after collection) at -20 degrees C or, ideally at -40 degrees C or below.
Additional Information:

1. A 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

If not ordering electronically, complete, print, and send a Coagulation Test Request (T753) with the specimen.

Specimen Minimum Volume

Platelet-poor plasma: 0.5 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Na Cit	Frozen	42 days	

Clinical & Interpretive

Clinical Information

Apixaban, an oral anticoagulant that directly inhibits factor Xa, has been approved by the US Food and Drug Administration for prophylaxis of thrombosis in atrial fibrillation and surgical patients and treatment of venous thromboembolism (VTE). Unlike warfarin, it does not require routine therapeutic monitoring. However, in selected clinical situations, measurement of drug level would be useful (eg, renal insufficiency, assessment of compliance, periprocedural measurement of drug concentration, suspected overdose, advanced age, and extremes of body weight).

Table. **Predicted Apixaban Steady-State Exposure Concentrations(1)**

Dosage	**Apixaban C-min (ng/mL)** trough plasma concentration (predose)	**Apixaban C-max (ng/mL)** peak plasma concentration (2-4 hours postdose)
Prevention of VTE: elective hip or knee replacement surgery		
2.5 mg twice daily	51 (23-109)	77 (41-146)
Prevention of stroke and systemic embolism: NVAF		
2.5 mg twice daily	79 (34-162)	123 (69-221)
5 mg twice daily	103 (41-230)	171 (91-321)
Treatment of DVT, treatment of PE and prevention of recurrent DVT and PE (VTE)		
2.5 mg twice daily	32 (11-90)	67 (30-153)
5 mg twice daily	63 (22-177)	132 (59-302)
10 mg twice daily	120 (41-335)	251 (111-572)

Median (5th-95th percentile)
Abbreviations not previously defined:
Nonvalvular atrial fibrillation (NVAF)
Deep vein thrombosis (DVT)
Pulmonary embolism (PE)

Reference Values
An interpretive report will be provided.

Interpretation
The lower limit of detection of this assay is 10 ng/mL.

Therapeutic reference ranges have not been established. See Clinical Information for peak and trough drug concentrations observed from clinical trials.

Cautions
Routine monitoring of apixaban is not indicated. Therapeutic reference ranges have not been established; however, peak and trough levels observed in clinical trials at different dosing are available. Apixaban concentration may be affected by drug interactions and liver or kidney disease.

Clinical Reference
1. Eliquis (apixaban). Package insert. Bristol-Meyers Squibb Company; Revised 11/2019
2. Hurst KV, O'Callaghan JM, Handa A. Quick reference guide to apixaban. Vasc Health Risk Manag. 2017;13:263-267
3. Granger CB, Alexander JH, McMurray JJ, et al. Apixaban versus warfarin in patient with atrial fibrillation. N Engl J Med. 2011;365(11):981-992
4. Frost C, Nepal S, Wang J, et al. Safety, pharmacokinetics and pharmacodynamics of multiple oral doses of apixaban, a factor Xa inhibitor, in healthy subjects. Br J Clin Pharmocol. 2013;76:(5):776-786
5. Agnelli G, Buller HR, Cohen A, et al. Oral apixaban for the treatment of acute venous thromboembolism. N Engl J Med. 2013;369(9):799-808
6. Siegal DM, Curnutte JT, Connolly SJ, et al. Andexanet alfa for reversal of factor Xa inhibitor activity. N Engl J Med. 2015;373(25):2413-2424
7. Martin K, Beyer-Westendorf J, Davidson BL, Huisman MV, Sandset PM, Moll S. Use of the direct oral anticoagulants in obese patients: guidance from the SSC of the ISTH. J Thromb Haemost. 2016;14(6):1308-1313

Performance

Method Description
The apixaban, anti-Xa assay is performed on the Instrumentation Laboratory ACL TOP Family using the HemosIL Liquid Anti-Xa kit. The liquid Anti-Xa kit is a 1-stage chromogenic assay based on a synthetic chromogenic substrate and on factor Xa inactivation. Factor Xa is neutralized directly by apixaban. Residual factor Xa is quantified with a synthetic chromogenic substrate. The paranitroaniline released is monitored kinetically at 405 nm and is inversely proportional to the apixaban in the sample.(Package insert: HemosiL Liquid Anti-Xa kit. Instrumentation Laboratory Company; Rev. 06/2017)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
1 to 3 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
This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
80299

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
APIXA	Apixaban, Anti-Xa, P	74214-8

Result ID	Test Result Name	Result LOINC® Value
APIX1	Apixaban, Anti-Xa, P	74214-8
APIX2	Interpretation	69049-5
APIX3	Cautions	62364-5