

## 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 Assay

### 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:** Plastic vial

**Specimen Volume:** 1 mL

### 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. Freeze plasma immediately (no longer than 4 hours after collection) at -20 degrees C or, ideally, < or =-40 degrees C.

### 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

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)
<b>Prevention of VTE: elective hip or knee replacement surgery</b>		
2.5 mg twice daily	51 (23-109)	77 (41-146)
<b>Prevention of stroke and systemic embolism: NVAF</b>		
2.5 mg twice daily	79 (34-162)	123 (69-221)
5 mg twice daily	103 (41-230)	171 (91-321)
<b>Treatment of DVT, treatment of PE and prevention of recurrent DVT and PE (VTE)</b>		
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)

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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 Pharmacol.* 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, Curnutt 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