Test Definition: FLUOX

Fluoxetine, Serum

Overview

Useful For

Monitoring serum concentration of fluoxetine during therapy

Evaluating potential toxicity

Evaluating patient compliance

Method Name

Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Red top (serum gel/SST are **not acceptable**)
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL Serum
Collection Instructions:
1. Draw blood immediately before the next scheduled dose (trough).
2. Within 2 hours of collection, centrifuge and aliquot serum into a plastic vial.

Forms

If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume

Serum: 0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum Red	Refrigerated (preferred)	28 days	
	Ambient	72 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Fluoxetine is a selective serotonin reuptake inhibitor approved for treatment of bulimia, obsessive-compulsive behavior, panic disorders, premenstrual dysphoria, and major depressive disorder, with a variety of off-label uses. Both fluoxetine and its major metabolite, norfluoxetine, are pharmacologically active and are reported together in this assay. Most individuals respond optimally when combined serum concentrations for both parent and metabolite are in the therapeutic range (120-500 ng/mL) at steady state. Due to the long half-life of the parent and metabolite (1-6 days), it may take several weeks for patients to reach steady-state concentrations. Fluoxetine is a potent inhibitor of the metabolic enzyme cytochrome P450 (CYP) 2D6, with lesser inhibitory effects on CYP2C19 and CYP3A. Therapy with fluoxetine is, therefore, subject to numerous drug interactions, which are compounded by wide interindividual variability in fluoxetine pharmacokinetics. Measurement of the drug is useful for managing comedications, dose or formulation changes, and in assessing compliance. Side effects are milder for fluoxetine than for older antidepressants, such as tricyclic antidepressants. The most common side effects of fluoxetine therapy include nausea, nervousness, anxiety, insomnia, and drowsiness. Anticholinergic and cardiovascular side effects are markedly reduced compared to tricyclic antidepressants. Fatalities from fluoxetine overdose are extremely rare.

Reference Values

Fluoxetine + Norfluoxetine: 120-500 ng/mL

Interpretation

Most individuals display optimal response to fluoxetine when combined serum levels of fluoxetine and norfluoxetine are between 120 and 500 ng/mL. Some individuals may respond well outside of this range or may display toxicity within the therapeutic range; therefore, interpretation should include clinical evaluation. A toxic range has not been well established.

Cautions

Specimens obtained using gel tube or anticoagulant collections can cause falsely decreased results or an assay interference.

Clinical Reference

1. Hiemke C, Bergemann N, Clement HW, et al. Consensus Guidelines for Therapeutic Drug Monitoring in Neuropsychopharmacology: Update 2017. Pharmacopsychiatry. 2018;51(1-02):9-62

2. Westanmo AD, Gayken J, Haight R. Duloxetine. A balanced and selective norepinephrine- and serotonin-reuptake inhibitor. Am J Health-Syst Pharm. 2005;62(23):2481-2490

3. Waldschmitt C, Vogel F, Pfuhlmann B, Hiemke C. Duloxetine serum concentrations and clinical effects. Data from a therapeutic drug monitoring (TDM) survey. Pharmacopsychiatry. 2009;42(5):189-193

4. Feighner JP, Cohn JB. Double-blind comparative trials of fluoxetine and doxepin in geriatric patients with major

depressive disorder. J Clin Psychiatry. 1985;46(3 Pt 2):20-25
5. Kelly MW, Perry PJ, Holstad SG, Garvey MJ. Serum fluoxetine and norfluoxetine concentrations and antidepressant response. Ther Drug Monit. 1989;11(2):165-170
6. Benfield P, Heel RC, Lewis SP. Fluoxetine: A review of its pharmacodynamic and pharmacokinetic properties, and therapeutic efficacy in depressive illness. Drugs. 1986;32(6):481-508
7. Wille SM, Cooreman SG, Neels, et al. Relevant issues in the monitoring and toxicology of antidepressants. Crit Rev Clin Lab Sci. 2008;45(1):25-89

Performance

Method Description
Serum samples containing fluoxetine and norfluoxetine are diluted in an aqueous solution containing deuterated internal standards and then injected onto a high-turbulence liquid chromatography system for online extraction. Detection is by tandem mass spectrometry.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Wednesday

Report Available
1 to 8 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

Test Definition: FLUOX

Fluoxetine, Serum

80299

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
FLUOX	Fluoxetine, S	78437-1

Result ID	Test Result Name	Result LOINC® Value
80228	Fluoxetine, S	74982-0
251	Norfluoxetine, S	3868-7
252	Fluoxetine+Norfluoxetine	74948-1