Test Definition: HALO

Haloperidol, S

Overview

Useful For

Optimizing dosage

Monitoring compliance

Assessing toxicity

Method Name

LiquidChromatography-TandemMassSpectrometry(LC-MS/MS)

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Specimen Required

Container/Tube: Red top

Specimen Volume:1 mL

Forms

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

Specimen Minimum Volume

0.3 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	28 days	
	Frozen	28 days	

Clinical and Interpretive

Clinical Information

Haloperidol (Haldol) is a member of the butyrophenone class of neuroleptic drugs used to treat psychotic disorders (eg, schizophrenia). It is also used to control the tics and verbal utterances associated with Tourette's syndrome and in the management of intensely hyperexcitable children who fail to respond to other treatment modalities.

The daily recommended oral dose for patients with moderate symptoms is 0.5 to 2.0 mg; for patients with severe symptoms, 3 to 5 mg may be used. However, some patients will respond only at significantly higher doses.

Haloperidol is metabolized in the liver to reduced haloperidol, its major metabolite.(1,2)

Use of haloperidol is associated with significant toxic side effects, the most serious of which include tardive dyskinesia which can be irreversible, extrapyramidal reactions with Parkinson-like symptoms, and neuroleptic malignant syndrome. Less serious side effects can include hypotension, anticholinergic effects (blurred vision, dry mouth, constipation, urinary retention), and sedation. The risk of developing serious, irreversible side effects seems to increase with increasing cumulative doses over time.(1,3)

Reference Values

HALOPERIDOL

5-16 ng/mL

REDUCED HALOPERIDOL

10-80 ng/mL

Interpretation

Studies show a strong relationship between dose and serum concentration (4); however, there is a modest relationship of clinical response or risk of developing long-term side effects to either dose or serum concentration.

A therapeutic window exists for haloperidol; patients who respond at serum concentrations between 5 to 16 ng/mL show no additional improvement at concentrations >16 to 20 ng/mL.(3,5) Some patients may respond at concentrations <5 ng/mL, and others may require concentrations significantly >20 ng/mL before an adequate response is attained.

Because of such inter-individual variation, the serum concentration should only be used as 1 factor in determining the appropriate dose and must be interpreted in conjunction with the clinical status.

Although the metabolite, reduced haloperidol, has minimal pharmacologic activity, evidence has been presented suggesting that an elevated ratio of reduced haloperidol-to-haloperidol (ie, >5) is predictive of a poor clinical response.(3,6) A reduced haloperidol-to-haloperidol ratio <0.5 indicates noncompliance; the metabolite does not accumulate except during steady-state conditions.

Cautions

Potentially interfering drugs include hydroxyzine (interferes with haloperidol), tiagabine (interferes with reduced haloperidol), and quetiapine (interferes with internal standard resulting in artificially low haloperidol).

Clinical Reference

1. Lawson GM: Monitoring of serum haloperidol. Mayo Clin Proc 1994;69:189-190

2. Ereshefsky L, Davis CM, Harrington CA, et al: Haloperidol and reduced haloperidol plasma levels in selected schizophrenic patients. J Clin Psychopharmacol 1984;4:138-142

3. Volavka J, Cooper TB: Review of haloperidol blood level and clinical response: looking through the window. J Clin Psycho-pharmacol 1987;7:25-30

4. Moulin MA, Davy JP, Debruyne JC, et al: Serum level monitoring and therapeutic effect of haloperidol in schizophrenic patients. Psychopharmacology 76:346-350, 1982

5. Van Putten T, Marder SR, Mintz J, Polant RE: Haloperidol plasma levels and clinical response: a therapeutic window relationship. Am J Psychiatry 1992;149:500-505

6. Shostak M, Perel JM, Stiller RL, et al: Plasma haloperidol and clinical response: a role for reduced haloperidol in antipsychotic activity? J Clin Psychopharmacol 1987;7:394-400

Performance

Method Description

Liquid-liquid extraction with liquid chromatography-tandem mass spectrometry (LC-MS/MS) detection.(Unpublished Mayo method)

PDF Report

No

Day(s) and Time(s) Test Performed

Tuesday; 4 p.m.

Analytic Time

2 days

Maximum Laboratory Time

5 days

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. 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. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information

80173

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
HALO	Haloperidol, S	87550-0

Result ID	Test Result Name	Result LOINC Value
80339	Haloperidol, S	3669-9
169	Reduced Haloperidol	38364-6