MAYO CLINIC LABORATORIES

Test Definition: HYPOG

Hypoglycemic Agent Screen, Serum

Overview

Useful For

Evaluation of suspected insulinoma characterized by hypoglycemia and increased serum insulin concentration

Detecting the following drugs that stimulate insulin secretion:
-First-generation sulfonylureas: chlorpropamide (Diabinese), tolazamide, and tolbutamide (Orinase)
-Second-generation sulfonylureas: glimepiride (Amaryl), glipizide (Glucotrol), and glyburide (Glibenclamide)
-Meglitinides: repaglinide (Prandin) and nateglinide (Starlix)
-Thiazolidinediones: pioglitazone (Actos) and rosiglitazone (Avandia)

This test is **not intended for** therapeutic drug monitoring but could be used to monitor compliance.

Highlights

If hypoglycemia is the result of an insulin-stimulating drug, this test will detect the drug at physiologically significant concentrations during an episode of hypoglycemia.

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Specimen Required

Patient Preparation: Specimen must be collected during an episode of hypoglycemia.
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:1.5 mL Serum
Collection Instructions: 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	Frozen (preferred)	28 days	
	Ambient	7 days	
	Refrigerated	28 days	

Clinical & Interpretive

Clinical Information

The metabolic and hormonal profiles of insulinoma and sulfonylurea-induced hypoglycemia are identical. Therefore, in the evaluation of the hypoglycemic patient, the possible use of oral hypoglycemic agents as the cause for low blood glucose and elevated serum insulin must be considered. Absence of hypoglycemic drugs in serum during an episode of low blood glucose should be demonstrated before considering pancreatic exploration for suspected insulinoma.

Reference Values

Negative
Screening cutoff concentrations
Chlorpropamide: 100 ng/mL
Glimepiride: 20 ng/mL
Glipizide: 5 ng/mL
Glyburide: 5 ng/mL
Nateglinide: 5 ng/mL
Pioglitazone: 20 ng/mL
Repaglinide: 5 ng/mL
Rosiglitazone: 20 ng/mL
Tolazamide: 50 ng/mL
Tolbutamide: 20 ng/mL

Note: If a drug is detected at a concentration greater than the cutoff, the report will indicate that specific drug is **positive**. The test cutoff listed for each drug is lower than the concentration that will cause increased insulin and decreased glucose.

Interpretation

Use of hypoglycemic agents outside of the context of treatment of type 2 diabetes is likely to cause hypoglycemia associated with elevated serum insulin. Patients presenting with hypoglycemia due to ingestion of a first-, second-, or third-generation hypoglycemic agents will have drug present in serum greater than the minimum effective

concentration (see Reference Values). Presence of drug indicates that the patient has recently ingested a hypoglycemic agent.

Cautions

Proper interpretation requires that the specimen be collected during or close to the time of a hypoglycemic episode. Drugs will not be detected (and are not likely to be present) if blood is drawn when blood glucose is normal in nondiabetic patients.

All drugs that stimulate insulin secretion undergo extensive metabolism before excretion. The parent drug is therefore not present in urine. Blood serum is the specimen of choice for detecting use of the hypoglycemic drugs; urine or plasma is not an acceptable specimen.

This screen does not include the first-generation sulfonylurea acetohexamide.

Other drugs that do not induce hypoglycemia, such as the thiazolidinediones troglitazone and lobeglitazone, and are designed to make tissues more sensitive to insulin are not included in this screen test.

Drugs that lower blood glucose through mechanisms not related to stimulation of insulin secretion, such as acarbose, metformin, and miglitol, are not included in this screen test.

Clinical Reference

1. Ben-Ami H, Nagachandran P, Mendelson A, Edoute Y. Drug-induced hypoglycemic coma in 102 diabetic patients. Arch Intern Med. 1999;159(3):281-284
2. Milone MC, Shaw LM. Therapeutic drugs and their management. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:420-453

Performance

Method Description

Serum specimens are subjected to organic extraction. The extract is analyzed by liquid chromatography tandem mass spectrometry.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday, Wednesday, Friday

Report Available

2 to 6 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

G0480

80377 (if appropriate for select payers)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
HYPOG	Hypoglycemic Agent Screen, S	68318-5

Result ID	Test Result Name	Result LOINC® Value
21295	Chlorpropamide	48329-7
21296	Tolazamide	21566-5
21297	Tolbutamide	21567-3
21298	Glimepiride	48325-5
21299	Glipizide	48326-3
21300	Glyburide	48327-1
21301	Repaglinide	48328-9
609767	Nateglinide	49487-2
609768	Pioglitazone	100351-6
609769	Rosiglitazone	100352-4