

Division of Laboratory Medicine

Biochemistry

Insulin

Investigation of hypoglycaemia (congenital hyperinsulinism, insulinoma, reactive hypoglycaemia).
 Assessment of insulin resistance (fasting or part of glucose tolerance test).

General information

Collection Container:

Lithium heparin plasma (Sarstedt orange top, 4.9 mL adults/1.2 mL paediatrics)
 Serum (Sarstedt brown top 4.9 mL adults/white top 1.2 mL paediatrics)

Type and volume of sample: 0.5 mL whole blood is required as a minimum volume.

Specimen transport/special precautions: The tubes should be thoroughly mixed and transported to the lab within 2.5 hours. Separate and freeze plasma/serum immediately.
 External labs: send plasma/serum frozen on dry ice.

Laboratory information

Method principle: Insulin is analysed using a manual solid phase two-site immunoassay. A peroxidase conjugated mouse monoclonal anti-Insulin antibody is used which reacts with 3,3',5,5'-tetramethylbenzidine (TMB). The reaction is stopped by adding acid to give a colorimetric endpoint that is read spectrophotometrically.

Biological Reference Range: Fasting reference range: 12 - 150 pmol/L

Turnaround time: 10 working days

Clinical information

The main uses of this insulin assay are investigation of hypoglycaemia and assessment of insulin resistance (fasting sample or as part of a glucose tolerance test). A laboratory glucose sample should be sent at the same time as the insulin sample if investigating the cause of hypoglycaemia.

This assay targets human insulin, therefore some exogenous insulin analogues may not be detected. Discuss with the laboratory if an insulin overdose is suspected.

Substance	Interference
Insulin Lispro (Humalog®)	<0.000003%
Insulin Aspart (Novorapid)	3.2%
Insulin Detemir (Levemir)	<0.000007%
Insulin Glargin (Lantus)	19%
Insulin Glulisine (Apidra)	<0.000003%

Division of Laboratory Medicine

Biochemistry

Actrapid

High

Cross-reactivity with insulin analogues:

Factors known to significantly affect the results: Haemolysed samples are unsuitable for analysis. Haemolysis can cause artificially low results even at very low levels due to the release of insulinases from red blood cells.

(Last updated February 2016)