

Overview

Useful For

Evaluation of metabolic status of patients with endocrinopathies

Monitoring of control of diabetes mellitus.

Monitoring the effects of therapeutic diet/exercise lifestyle changes

Method Name

Enzymatic Colorimetric

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Patient Preparation:

1. Fasting-overnight (12-14 hours).
2. Patient must not consume any alcohol for 24 hours before the specimen is collected.
3. Patient should not be receiving therapeutic heparin.

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Collection Instructions:

1. Centrifuge within 45 minutes of collection and aliquot 1 mL of serum into a plastic vial.
2. Immediately freeze specimen.

Forms

If not ordering electronically, complete, print, and send a [Cardiovascular Test Request Form](#) (T724) with the specimen.

Reject Due To

Gross hemolysis Reject
Gross lipemia Reject
Gross icterus Reject

Specimen Minimum Volume

0.5 mL

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Frozen (preferred)	7 days	

Clinical & Interpretive

Clinical Information

Elevated serum concentrations of nonesterified fatty acids (NEFA) are associated with cardiovascular disease, metabolic syndrome, obesity, and type 2 diabetes mellitus. NEFA are causally linked with insulin resistance and inflammation of vascular endothelium.

Reference Values

> or =18 years: 0.00-0.72 mmol/L

Reference values have not been established for patients who are <18 years of age.

Interpretation

Abnormally high levels of free fatty acids are associated with uncontrolled diabetes mellitus and with conditions that involve excessive release of a lipolytic hormone such as epinephrine, norepinephrine, glucagon, thyrotropin, and adrenocorticotropin.

Cautions

Patients receiving therapeutic heparin are unsuitable for this analysis. Heparin causes the release of free fatty acids by stimulating the activity of lipoprotein lipase, which causes triglycerides associated with blood lipoproteins to release free fatty acids.

In order to eliminate the generation of free fatty acids from triglycerides by serum lipases (causing erroneous elevations), serum should be frozen as soon as possible after it is collected and shipped frozen.

Clinical Reference

1. Boden G: Obesity and free fatty acids. *Endocrinol Metab Clin North Am.* 2008 Sep;37(3):635-646, viii-ix. doi: 10.1016/j.ecl.2008.06.007
2. Haus JM, Soloman TP, Marchetti CM, Edmison JM, Gonzalez F, Kirwan JP: Free fatty acid-induced hepatic insulin resistance is attenuated following lifestyle intervention in obese individuals with impaired glucose tolerance. *J Clin Endocrinol Metab.* 2010 Jan;95(1):323-327. doi: 10.1210/jc.2009-1101
3. Imrie H, Abbas A, Kearney M: Insulin resistance, lipotoxicity and endothelial dysfunction. *Biochim Biophys Acta.* 2010 Mar;1801 (3):320-326. doi: 10.1016/j.bbailip.2009.09.025

Performance**Method Description**

In the presence of adenosine triphosphate (ATP) and coenzyme A (CoA), serum non-esterified fatty acids (NEFA) form acyl-CoA, adenosine monophosphate (AMP) and pyrophosphate (PPI) when treated with acylCoA synthetase (ACS). The acylCoA is then oxidized by adding acylCoA oxidase (ACOD) to produce hydrogen peroxide, which in the presence of added peroxidase allows for the oxidative condensation of 3-methyl-N-ethyl-N-(beta-hydroxyethyl)-aniline (MEHA) with 4-aminoantipyrine to form a purple colored end product. (Package insert: HR Series NEFA-HR(2). Fujifilm WAKO Pure Chemical Corp; 18.03.19K04)

PDF Report

No

Specimen Retention Time

7 days

Performing Laboratory Location

Rochester

Fees & Codes**Test Classification**

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

82725

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
NEFA	Free Fatty Acids, Total, S	15066-4

Result ID	Reporting Name	LOINC®
NEFA	Free Fatty Acids, Total, S	15066-4