Test Definition: NEFA

Free Fatty Acids, Total, Serum

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: 12 hours, required**
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. Within 45 minutes of collection, centrifuge 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.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Frozen	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 lipoactive 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;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;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;1801 (3):320-326. doi:10.1016/j.bbalip.2009.09.025

4. Marusic M, Paic M, Knobloch M, Liberati Prso AM. NAFLD, Insulin Resistance, and Diabetes Mellitus Type 2. Can J Gastroenterol Hepatol. 2021;2021:6613827. doi:10.1155/2021/6613827

Performance

Method Description

In the presence of adenosine triphosphate and coenzyme A (CoA), serum non-esterified fatty acids form acyl-CoA, adenosine monophosphate and pyrophosphate when treated with acylCoA synthetase. The acylCoA is then oxidized by adding acylCoA oxidase 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 with 4-aminoantipyrine to form a purple colored end product.(Package insert: HR Series NEFA-HR(2). Fujifilm Healthcare Americas Corporation; 22.01.20K08 12/2021)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 3 days

Specimen Retention Time

7 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

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 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 Definition: NEFA

Free Fatty Acids, Total, Serum

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

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