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MAYO CLINIC LABORATORIES

Test Definition: LACS1

Lactate, Plasma

Overview

Useful For

Diagnosing and monitoring patients with lactic acidosis

Screening high-risk patients for sepsis or septic shock

Method Name

Enzymatic Colorimetric

NY State Available

Yes

Specimen

Specimen Type

Plasma NaFl-KOx

Ordering Guidance

This test does not measure D-lactate, an uncommon, often undiagnosed cause of lactic acidosis. If D-lactate testing is needed, order DLAC / D-Lactate, Plasma.

Necessary Information

Patient's age and sex are required.

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Gray top (potassium oxalate/sodium fluoride)
Submission Container/Tube: Plastic vial
Specimen Volume: 0.625 mL Plasma
Collection Instructions:
1. Draw at least 1 mL whole blood in a 2-mL collection tube or at least 2 mL whole blood in a 4-mL collection tube.
2. Centrifuge and aliquot plasma into a plastic vial.

Specimen Minimum Volume

Plasma: 0.25 mL

Reject Due To

Gross hemolysis	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma NaFl-KOx	Refrigerated (preferred)	14 days	
	Ambient	8 hours	

Clinical & Interpretive

Clinical Information

Lactate is the end product of anaerobic carbohydrate metabolism and increases with prolonged exercise. Major sites of production are skeletal muscle, brain, and erythrocytes. Lactate is metabolized by the liver. The concentration of lactate depends on the rate of production and the rate of liver clearance. The liver can adequately clear lactate until the concentration reaches approximately 2.0 mmol/L. When this level is exceeded, lactate begins to accumulate rapidly. For example, while resting lactate levels are usually below 1 mmol/L, during strenuous exercise, levels can rise above 20 mmol/L within a few seconds.

Lactic acidosis signals the deterioration of the cellular oxidative process and is associated with hyperpnea, weakness, fatigue, stupor, and finally coma. These conditions may be irreversible, even after treatment is administered. Lactate acidosis may be associated with hypoxic conditions (eg, shock, hypovolemia, heart failure, pulmonary insufficiency), metabolic disorders (eg, diabetic ketoacidosis, malignancies), and toxin exposures (eg, ethanol, methanol, salicylates).

Reference Values

0-2 months: < or =3.3 mmol/L
3-24 months: < or =3.1 mmol/L
25 months-17 years: < or =2.2 mmol/L
> or = 18 years: 0.5-2.0 mmol/L

Interpretation

While no definitive concentration of lactate has been established for the diagnosis of lactic acidosis, lactate concentrations exceeding 5 mmol/L and pH below 7.25 are generally considered indicative of significant lactic acidosis.

Elevated lactate (above laboratory reference interval or above 2.0 mmol/L in the absence of hypovolemia) in the context of sepsis evaluation in the hospital may warrant additional investigation to determine if sepsis or septic shock is present or developing.

Adult clinical action limit: Concentration greater than 2.0 mmol/L will flag as abnormal.(1)

Cautions

Proper specimen collection and processing techniques are critical for reliable results.

Clinical Reference

1. Townsend SR, Phillips GS, Duseja R, et al. Effects of compliance with the early management bundle (SEP-1) on mortality changes among medicare beneficiaries with sepsis: A propensity score matched cohort study. Chest. 2022;161(2):392-406. doi:10.1016/j.chest.2021.07.2167
2. Mizock BA. The hepatosplanchnic area and hyperlactatemia: A tale of two lactates. Crit Care Med.

2001;29(2):447-449. doi:10.1097/00003246-200102000-00047
3. Duke T: Dysoxia and lactate. Arch Dis Child. 1999;81(4):343-350. doi:10.1136/adc.81.4.343
4. Sacks D: Carbohydrates. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 6th ed. Elsevier; 2018:518-538

Performance

Method Description
Lactate concentration is determined using an enzymatic colorimetric method. L-lactate is oxidized to pyruvate by the specific enzyme lactate oxidase. Peroxidase generates a colored dye using the hydrogen peroxide generated in the first reaction. The intensity of the color formed is directly proportional to the L-lactate concentration. Concentration is determined by measuring the increase in absorbance.(Package insert: Lactate. Roche Gen.2 Reagent; V15, 08/2024)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 to 2 days

Specimen Retention Time
2 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
83605

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
LACS1	Lactate, P	2524-7

Result ID	Test Result Name	Result LOINC® Value
LACS1	Lactate, P	2524-7