

Lactate Dehydrogenase, LDH

General:

Lactate dehydrogenase catalyzes the interconversion of pyruvate and lactate with concomitant interconversion of NADH and NAD⁺. It converts pyruvate, the final product of glycolysis to lactic acid if oxygen is absent, and it performs the reverse reaction during the cori cycle in the liver. If lactate concentrations are high, the enzyme is inhibited by a feedback mechanism and the conversion rate of pyruvate to lactate is decreased.

The measurable LDH activity in serum consists of active parts of 5 isoenzymes LDH 1-5. Isoenzyme LDH1 can be tested separately as hydroxybutyrate-dehydrogenase (HBDH). LDH is a cytoplasmic enzyme and is present in all tissues. The LDH concentration is approx. 360 times higher in erythrocytes than in serum, therefore, the blood has to be hemolysis free and the blood clot must be separated within one hour.

Indication:

Suspicion of recent heart attack, course evaluation of the heart attack, embolism of the lungs, disorders of the liver and bile ducts, intoxications, hemolysis parameter, suspicion of muscle disease, tumor monitoring.

LDH is often used as a marker of tissue necrosis and/or malignant cell turnover. In addition, LDH is abundant in red blood cells and can be used as a marker for hemolysis.

LDH is often tested in HIV patients as a non-specific marker for pneumonia due to *Pneumocystis jiroveci* (PCP). However, in HIV-positive patients with respiratory symptoms, a very high LDH level (>600 U/l) might indicate histoplasmosis.

The following tests are available:

- **Lactate dehydrogenase in serum**

Material: 1 ml serum

Preanalytics: hemolysis results in falsely elevated LDH levels, oxalate-anticoagulation

Stability: 4 days at 2-8°C

TAT: same day, FML

Method: enzymatic

Units: U/l

Ref.- range: see report

- **Lactate dehydrogenase in aspirate[^]**

General :

Measuring LDH in fluid aspirated from a pleural effusion (or pericardial effusion) can help in the distinction between exudates (actively secreted fluid, e.g. due to inflammation) or transudates (passively secreted fluid, due to a high hydrostatic pressure or a low oncotic pressure). LDH is elevated (>200 U/l) in an exudate and low in a transudate. In empyema, the LDH levels generally exceed 1000 U/l.

Material: 1 ml aspirate

TAT: same day, FML

Method: enzymatic

Units: U/l

Ref.- range: <200

- **Lactate dehydrogenase isoenzymes**

General :

5 isoenzymes of LDH exist:

LDH-1 in the heart; LDH-2 in the reticuloendothelial system (RES); LDH-3 in the lungs; LDH-4 in the kidneys; LDH-5 in the liver and striated muscle.

Usually LDH-2 is the predominant form in serum. A LDH-1 level higher than the LDH-2 level suggests myocardial infarction (damage to heart tissues releases heart LDH, which is rich in LDH-1, into the bloodstream). The use of this phenomenon to diagnose infarction has been largely superseded by the use of Troponin I or T measurement.

Material: 2 ml serum

Preanalytics : Do not cool or freeze serum! Store and ship at room temperature!

TAT: 7-10 days*

Method: enzymatic

- **Lactate dehydrogenase in CSF[^]**

General :

High levels of lactate dehydrogenase in cerebrospinal fluid are often associated with bacterial or viral meningitis, generally indicating the presence of encephalitis and poor prognosis.

Material: 2 ml CSF

TAT: same day, FML

Method: enzymatic

For complete list of laboratory test offered at Freiburg Medical Laboratory, please visit <http://www.fml-dubai.com/parameter-listings/>