

Alanine Aminotransferase (ALT)

WHAT IS ALANINE AMINOTRANSFERASE?

Alanine aminotransferase (ALT) is an enzyme involved in amino acid metabolism. Measurements of ALT are useful for detecting liver disease and monitoring overall health (1). The highest levels of ALT are detected in liver tissues. When the liver is damaged, ALT is released into the circulating blood, resulting in increased blood levels that can be detected from a blood sample (2).

PURPOSE OF AN ALANINE AMINOTRANSFERASE TEST

ALT levels are elevated before clinical signs and symptoms of liver disease appear, providing an important tool for prompt diagnoses. Early diagnosis of liver issues is essential as the liver is very good at repairing and regenerating itself, but only in the early stages of liver damage (hepatitis and fibrosis). However, often people do not show any symptoms until the scarring gets worse and becomes irreversible cirrhosis (severe scarring). Cirrhosis is associated with a very high risk of developing liver cancer and liver failure.

ALANINE AMINOTRANSFERASE REFERENCE RANGES

The upper limit of normal serum ALT differs between studies as various factors influence ALT levels, including ethnicity, gender, age, and bodyweight (1). According to the package insert for the assay available here, the reference range is 0-55 U/L for children and adults (3).

ELEVATED ALANINE AMINOTRANSFERASE

Markedly high ALT levels in serum occur in various diseases that affect the liver, including hepatitis, mononucleosis, and cirrhosis. Typically, ALT values are at least 10-fold higher than the normal range in individuals with liver disease. In addition, ALT levels are elevated before clinical signs and symptoms of liver disease appear providing an important tool for prompt diagnoses (4).

Measurements of ALT activity are also useful for monitoring overall health, as ALT levels can be elevated in various other health conditions, including diabetes, cardiovascular disease, obesity, and metabolic syndrome (5; 6; 7).

TEST PROCEDURE

Correct specimen collection and handling is required for optimal assay performance.

This test requires a blood sample from a finger prick. All supplies for sample collection are provided in this kit. First wash and dry hands. Warm hands aid in blood collection. Clean the finger prick site with the alcohol swab and allow to air dry. Use the provided lancet to puncture the skin in one quick, continuous and deliberate stroke. Wipe away the first drop of blood (as it may be contaminated with tissue fluid or skin debris). Massage finger to increase blood flow at the puncture site and hold in a position that gravity facilitates the collection of blood on the fingertip. Transfer the blood to the blood collection card or blood collection tube (microtainer).

Avoid squeezing or 'milking' the finger excessively. If blood flow stops, perform a second skin puncture on another finger if more blood is required.

Dispose of all sharps safely and return sample to the laboratory in the provided prepaid return shipping envelope.

Upon receipt at the laboratory, the blood sample is analyzed by the fully automated Alinity c Alanine Aminotransferase assay on the Alinity ci series analyzer. This assay determines alanine aminotransferase levels using the enzymatic NADH methodology, where alanine aminotransferase in the blood specimen catalyzes the transfer of the amino group from L-alanine to α -ketoglutarate, forming pyruvate and L-glutamate. The pyruvate is reduced to L-lactate in the presence of lactate dehydrogenase and NADH, which is oxidized to NAD. This results in an absorbance decrease at 340 nm, which is proportional to the amount of alanine aminotransferase activity in the specimen.

TEST INTERPRETATION

This assay will provide an accurate ALT level for the tested blood specimen. Typical ALT levels in serum are < 55 U/L for children and adults (3). Additional testing may be required to determine the cause of abnormal ALT levels.

DISCLAIMERS/LIMITATIONS

Certain medications (e.g., statins, aspirin, opioids, and some antibiotics), some natural health products, very strenuous recent physical exercise or severe injury to muscle, and recent surgery may affect ALT test results.

These results should be interpreted in conjunction with other laboratory and clinical information.

Additional testing is recommended if alanine aminotransferase levels are inconsistent with clinical evidence.

Correct specimen collection and handling is required for optimal assay performance.

Hemolysis in serum or plasma specimens can increase test results by 3- to 5-fold.

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