



Web: MayoMedicalLaboratories.com
Email: mml@mayo.edu
Telephone: 800.533.1710
International: 507.266.5700
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Test ID: CK

Creatine Kinase (CK), Serum

Useful For

The determination of creatine kinase is utilized in the diagnosis and monitoring of myocardial infarction and myopathies such as the progressive Duchenne muscular dystrophy.

Clinical Information

Creatine Kinase (CK) activity is greatest in striated muscle, heart tissue, and brain. The determination of CK activity is a proven tool in the investigation of skeletal muscle disease (muscular dystrophy) and is also useful in the diagnosis of myocardial infarction (MI) and cerebrovascular accidents. Increased levels of CK also can be found in viral myositis, polymyositis, and hypothyroidism.

Following injury to the myocardium, such as occurs in acute MI, CK is released from the damaged myocardial cells. A rise in the CK activity can be found 4 to 8 hours after an infarction. CK activity reaches a maximum after 12 to 24 hours and then falls back to the normal range after 3 to 4 days.

Reference Values

Males

6-11 years: 150-499 U/L

12-17 years: 94-499 U/L

> or =18 years: 52-336 U/L

Females

6-7 years: 134-391 U/L

8-14 years: 91-391 U/L

15-17 years: 53-269 U/L

> or =18 years: 38-176 U/L

Reference values have not been established for patients that are less than 6 years of age.

Note: Strenuous exercise or intramuscular injections may cause transient elevation of CK.

Interpretation

Serum creatine kinase (CK) activity is greatly elevated, at some time during the course of the disease, in all types of muscular dystrophy, and especially so in Duchenne type, in which levels up to 50 times the upper limit of normal may be encountered. In progressive muscular dystrophy, enzyme activity in serum is highest in infancy and childhood (7-10 years of age) and may be elevated long before the disease is clinically apparent. Quite high values of CK are noted in viral myositis, polymyositis, and similar muscle diseases. However, in neurogenic Parkinsonism, serum enzyme activity is normal. Very

high activity is also encountered in malignant hyperthermia.

An early rise in CK is also seen after an acute MI, with values peaking at 12 to 24 hours and falling back to normal in 3 to 4 days. Although total CK activity has been used as a diagnostic test for MI, it has been replaced by the troponin T and I immunoassays, and is no longer the laboratory test choice for diagnosing and monitoring acute infarctions. Serum CK activity may increase in patients with acute cerebrovascular disease or neurosurgical intervention and with cerebral ischemia. Serum CK activity also demonstrates an inverse relationship with thyroid activity. About 60% of hypothyroid subjects show an average elevation of CK activity 5-fold over the upper reference limit; elevation of as high as 50-fold may also be found.

Cautions

Exercise and muscle trauma (contact sports, traffic accidents, intramuscular injections, surgery, convulsions, wasp or bee stings, and burns) can elevate serum creatine kinase values.

Clinical Reference

Tietz Textbook of Clinical Chemistry, Edited by CA Burtis, ER Ashwood, WB Saunders Company, Philadelphia, 1999

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