

# Creatine Kinase - CK Isoenzymes

## General:

CK isoenzyme tests are performed if the total CK level is elevated. Isoenzyme testing can help to differentiate the source of the damaged tissue. CK is an enzyme found predominantly in heart, brain, and skeletal muscle. CK is composed of 3 isoenzymes that differ slightly in structure. CK-BB: is concentrated in the brain and lungs, CK-MB: is found mostly in the heart, CK-MM is found mostly in skeletal muscle. Damages to either of these organs (for example, stroke or lung injury due to a pulmonary embolism) are associated with elevated levels of this isoenzyme.

The following tests are available:

- **CK-MB (Isoenzyme)**

## General:

The isoenzyme MB (muscle-brain) of creatine kinase is relatively cardiac muscle specific.

CK-MB levels rise 3-6 hours after a heart attack. If there is no further damage to the heart muscle, the peak level is found 12-24 hours and returns to normal 12-48 hours after cell death. CK-MB levels do not usually rise with chest pain caused by angina, pulmonary embolism (blood clot in the lung), or congestive heart failure.

Indication: Suspicion of myocardial infarct

Material: 1 ml serum

TAT: CK-MB isolated as marker for myocardial infection is done at FML, same day.  
Together with the other CK isoenzymes: 7-10 days\*

Method: Gel electrophoresis

Units: %

Ref.- range: <3.0

Note: The determination of troponin in serum is recommended for all cases suspicious of heart attack. Follow up values are important!

Comment: CK-MB increases can be – rarely - triggered by increases of CK-BB or CKMiMi (e.g. in tumors), by macro-CK (immune complex formation with IgG: occurrence in 1% of aged persons, without pathogenic significance); others: myocarditis, electrical injuries, trauma to the heart, defibrillation, open heart surgery;

- **CK-BB (Isoenzyme)**

Material: 1 ml serum

TAT: 5-7 days\*

Method: Gel electrophoresis

Units: %

Ref.- range: 0.0

- **CK-MM (Isoenzyme)**

Material: 1 ml serum

TAT: 5-7 days\*

Method: Gel electrophoresis

Units: %

Ref.- range: 97 - 100

- **Macro-CK (Isoenzyme)**

General:

Macro-CK are CK-variants with a high molecular mass resulting in falsely high CK-concentration. Macro-CK-type 1 results from a bond between CKBB and specific antibodies, however, Macro-CK is without clinical significance. Macro-CK type 2 is a mitochondrial CK in oligomeric form which is often associated with severe disorders, e.g. tumors, liver-cirrhosis, Lyell's-syndrome.

Material: 1 ml serum

TAT: 5-7 days\*

Method: Gel Electrophoresis

Units: %

Ref.- range: 0.0

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