Cardiac Biomarkers (Blood)

Does this test have other names?

CK, CK-MB, cardiac troponin T, troponin I, myoglobin, cardiac enzymes

What is this test?

This test measures the levels of cardiac biomarkers in your blood. These markers include enzymes, hormones, and proteins.

Cardiac biomarkers show up in your blood after your heart has been under severe stress and becomes injured because it isn't getting enough oxygen. This might be because you've had a heart attack. But these levels can be high for other reasons. The levels of biomarkers are often used to quickly find out the size of a heart attack and how seriously your heart was affected.

These cardiac biomarkers can be used to diagnose a heart attack:

- **Cardiac troponin.** This protein is by far the most commonly used biomarker. It has the highest known sensitivity. It enters into your bloodstream soon after a heart attack. It also stays in your bloodstream days after all other biomarkers go back to normal levels. Two forms of troponin may be measured: troponin T and troponin I. Troponin I is highly specific to the heart and stays higher longer than creatinine kinase-MB. Current guidelines from the American Heart Association (AHA) say this is the best biomarker for finding a heart attack. The AHA says to limit use of the other biomarkers. These include CK, CK-MB, and myoglobin.

- **Creatinine kinase (CK).** This enzyme can also be measured several times over a 24-hour period. It will often at least double if you've had a heart attack. But because levels of CK can go up in many other conditions besides a heart attack, it is not very specific.

- **CK-MB.** This is a subtype of CK. It is more sensitive for finding heart damage from a heart attack. CK-MB rises 4 to 6 hours after a heart attack. But it is generally back to normal in a day or two. Because of this, it's not helpful when a healthcare provider is trying to figure out if your recent chest pain was a heart attack.

- **Myoglobin.** This is a small protein that stores oxygen. It is measured occasionally. Myoglobin is sometimes measured in addition to troponin to help diagnose a heart attack. It is also not very specific for finding a heart attack.

Why do I need this test?

You may need this test if your healthcare provider thinks you're having or have recently had a heart attack. You may also need this test if you have symptoms of coronary artery blockage.

Symptoms of coronary blockage may include:

- Chest pain or pressure that lasts for more than a few minutes

- Pain or discomfort in your shoulders, neck, arms, or jaw

- Chest pain that gets worse

- Chest pain that doesn’t get better by rest or by taking nitroglycerin

Other symptoms that may happen along with chest pain may include:

- Sweating, cool, clammy skin, or paleness

- Shortness of breath
- Nausea or vomiting
- Dizziness or fainting
- Unexplained weakness or extreme tiredness (fatigue)
- Fast or irregular pulse

What other tests might I have along with this test?

You may need other tests to measure other factors in your blood or in your heart, or both. These include:

- Blood gases or other tests to measure oxygen in the blood
- Complete blood count (CBC)
- Electrolytes (sodium, potassium, chloride)
- Blood lipids (cholesterol and triglycerides)
- Blood sugar (glucose)
- Electrocardiogram (ECG)
- Echocardiogram or ultrasound of the heart muscle
- Cardiac catheterization or coronary angiogram
- B-type natriuretic peptide (BNP). This is to find stress in the heart or heart failure after a heart attack.

What do my test results mean?

Test results may vary depending on your age, gender, health history, and other things. Your test results may be different depending on the lab used. They may not mean you have a problem. Ask your healthcare provider what your test results mean for you.

Results are given in nanograms per milliliter (ng/mL). People who are young and healthy often have little or no cardiac troponin in their blood. Troponin I levels are often less than 0.12 ng/mL. Troponin T levels are often less than 0.01 ng/mL.

Normal-level results vary. But cardiac troponin levels above the 99th percentile of the reference range suggest heart muscle damage and a heart attack.

How is this test done?

The test is done with a blood sample. A needle is used to draw blood from a vein in your arm or hand.

Does this test pose any risks?

Having a blood test with a needle carries some risks. These include bleeding, infection, bruising, and feeling lightheaded. When the needle pricks your arm or hand, you may feel a slight sting or pain. Afterward, the site may be sore.

What might affect my test results?

Other factors aren't likely to affect your results.

How do I get ready for this test?

You don't need to get ready for this test. Be sure your healthcare provider knows about all medicines, herbs, vitamins, and supplements you are taking. This includes medicines that don't need a prescription and any illegal drugs you may use.