

Purpose

C-reactive protein is not normally found in the blood of healthy people. It appears after an injury, infection, or inflammation and disappears when the injury heals or the infection or inflammation goes away. Research suggests that patients with prolonged elevated levels of C-reactive protein are at an increased risk for heart disease, [stroke](#), hypertension (high blood pressure), diabetes, and metabolic syndrome ([insulin resistance](#), a precursor of type 2 diabetes). The amount of CRP produced by the body varies from person to person, and this difference is affected by an individual's genetic makeup (accounting for almost half of the variation in CRP levels between different people) and lifestyle. Higher CRP levels tend to be found in individuals who smoke, have high blood pressure, are overweight and do not [exercise](#), whereas lean, athletic individuals tend to have lower CRP levels.

The research shows that too much inflammation can sometimes have adverse effects on the blood vessels which transport oxygen and nutrients throughout the body. [Atherosclerosis](#), which involves the formation of fatty deposits or plaques in the inner walls of the arteries, is now considered in many ways an inflammatory disorder of the blood vessels, similar to the way arthritis can be considered an inflammatory disorder of the bones and joints. Inflammation affects the atherosclerotic phase of heart disease and can cause plaques to rupture, which produces a clot and interfere with blood flow, causing a [heart attack](#) or stroke.

There is an association between elevated levels of inflammatory markers (including CRP) and the future development of heart disease. This correlation applies even to apparently healthy men and women who have normal cholesterol levels. CRP level can be used by physicians as part of the assessment of a patient's risk for heart disease because it is a stable molecule and can be easily measured with a simple blood test. In patients already suffering from heart disease, doctors can use CRP levels to determine which patients are at high risk for recurring coronary events.

Precautions

As of 2005, there are no precautions regarding the C-reactive protein test. The person withdrawing blood for the test should be notified if the patient is allergic to latex or has a fear of needles.

Description

C-reactive protein was discovered in 1930, but few people outside the medical community had heard of it until stories about it began hitting the mainstream media in early 2005. In 2005, two studies published in the January 6, 2005, issue of *The New England Journal of Medicine* provide the best evidence to date that the C-reactive protein level in a person's blood is an important and highly accurate predictor of future heart disease. C-reactive protein (CRP) is a sign of inflammation in the walls of arteries. The studies show that reducing the inflammation by lowering CRP levels with a class of drugs known as statins significantly lowers the rate of heart attacks and coronary-artery disease in people with acute heart disease. In fact, the studies indicated CRP levels may be as important—if not more important—in predicting and preventing heart disease as cholesterol levels are.

Persons with moderate or high levels of CRP can often reduce the levels with lifestyle changes, including quitting [smoking](#), engaging in regular exercise, taking in healthy [nutrition](#), taking a multivitamin daily, replacing saturated fats such as butter with monounsaturated fats (particularly olive oil), increasing intake of [Omega-3 fatty acids](#), losing weight if overweight, and increasing fiber intake. Drugs called statins (usually used to reduce high levels of low density lipoproteins (LDL), the so-called bad cholesterol, can also reduce CRP levels. These drugs include: *lovastatin* (Mevacor), *simvastatin* (Zocor), *rosuvastatin* (Crestor), and the two drugs used in the 2005 CRP studies, *pravastatin* (Pravacol) and *atorvastatin* (Lipitor). Other drugs that lower CRP levels include the anti-cholesterol drug *ezetimibe* (Zetia) and the diabetes medication *rosiglitazone* (Avandia).

Not all physicians are convinced the two studies published in 2005 are accurate, noting that both studies were funded by pharmaceutical companies (Pfizer and Bristol-Meyer Squibb) that make statin drugs used to reduce CRP levels. Also, the lead authors of the studies have "strong financial ties to the cardiac drug industry," according to an article in the February 2005 issue of *HealthFacts*. The article also states that study participants already had severe heart disease

and in one study, 36% of the participants smoked. It added that the CRP test is still unproven in predicting future acute heart problems in people with mild heart disease or healthy people at risk for developing heart disease.

The C-reactive protein test costs \$45 to \$85, is performed in physicians' offices, labs, and hospitals. Medicare usually covers the cost as do most other insurance plans.

Preparation

No advance preparation for the CRP test is needed on the part of the patient. The test is conducted on a small sample of blood that usually takes about a minute to withdraw from a patient's vein. The CRP test is performed in a laboratory and the results are usually available in three to five days. A healthcare professional, usually a nurse or laboratory technician, will wrap and tighten a latex strap around the patient's upper arm. The site where blood will be drawn (usually the bend in the arm above the elbow) will be swabbed with alcohol. A small needle attached to a collection vial will be inserted into a vein and a small amount of blood will be withdrawn. When the vial is full, the needle and strap will be removed and a cotton ball will be taped over the injection site.

Aftercare

The tape and cotton can be removed when bleeding at the needle puncture site stops, usually within 15 to 20 minutes. The amount of bleeding should be very light.

Risks