High-Sensitivity C-Reactive Protein (hsCRP)

CPT Code **86141***
Order Code **C121**
Sample Type **EDTA Plasma or Serum**
Tube Type **Lavender Top or Tiger Top**
LCD-CGS **L36139**

hsCRP levels (1-10 mg/L) are associated with:

- Cardiovascular disease (CVD)
- Periodontal disease

hsCRP levels (>10 mg/L) are associated with:

- Acute illness (cold, flu, or infection)
- Chronic illness
- Autoimmune disorders

Description

The hsCRP test is a highly sensitive quantification of C-Reactive Protein (CRP), an acute-phase protein released into the blood by the liver during inflammation.[1] Elevations in CRP may occur due to instances such as illness, trauma, or surgery.[1] Increased sensitivity allows for detection of low-level elevations of CRP, which are associated with the presence of CVD.

Clinical Use

The hsCRP test may be performed on individuals at intermediate risk (10-year risk of 10%-20%) of developing CVD who are metabolically stable without inflammatory or infectious conditions.

Clinical Significance

- hsCRP is a well-documented clinical marker of general and cardiac-related inflammation.
- Apparently healthy individuals with elevated hsCRP values are up to 4x as likely to have coronary heart disease (CHD).[2,3]
- Elevated hsCRP is associated with the risk of future adverse cardiovascular events (heart attack, stroke, and death) in apparently healthy individuals,[2,4] individuals with stable coronary artery disease,[5] or individuals who have previously experienced a heart attack.[6]
- Reductions in both hsCRP and low-density lipoprotein (LDL) cholesterol are associated with a reduction in the rate of atherosclerosis progression[7] and improved clinical outcomes.[8]
- In the JUPITER trial, introduction of statin therapy in patients with elevated hsCRP, even with normal lipid levels, significantly reduced risk for heart attack, stroke, and death.[9]
- The CANTOS trial demonstrated that lowering hsCRP, independent of lipid levels, resulted in a 15% risk reduction of recurrent cardiovascular events.[6]

Testing Frequency

The frequency of testing is determined by an individual's medical history, but an elevated hsCRP level should be confirmed with an additional measurement. Levels >10 mg/L may reflect acute infection, systemic inflammatory processes, or trauma. Therefore, the American Heart Association and Center for Disease Control and Prevention recommend that the test is repeated in 2-3 weeks to allow acute inflammation to subside, with the lower value, not the average, used for risk prediction.[10,11]

Sample Type

The hsCRP test should be performed on a serum or EDTA plasma sample. Fasting is not required.

Commercial Insurance or Medicare Coverage

Coverage guidelines, also known as NCD (National Coverage Determination) or LCD (Local Coverage Determination), have been established or posted by CMS (Medicare & Medicaid). Guidelines should be reviewed for coverage and limitation. Limited information has been provided by the majority of the larger carriers (Aetna, United Healthcare, Cigna, Blues).

6701 Carnegie Ave. | Suite 500 | Cleveland, OH 44103
p 866.358.9828 | f 866.869.0148
clevelandheartlab.com | knowyourrisk.com | chlcme.com

ClevelandHeartLab®
Know your risk.

Quest Diagnostics™

RELATIVE RISK

hsCRP
(mg/L)

<1.0 Low	1.0-3.0 Moderate	≥3.0 High

Treatment Considerations†

These treatment considerations are for educational purposes only. Specific treatment plans should be provided and reviewed by the treating practitioner.

Assess presence of acute (infection, surgery, trauma, etc.)[1] or chronic illness (chronic obstructive pulmonary disease,[12] rheumatoid arthritis,[1] cancer,[1] etc.).

✓ **Assess lifestyle habits.**

- Consider diet, exercise, and weight reduction efforts if appropriate.[13,14]

✓ **Assess LDL-C levels.**

- If not at optimal levels, consider lipid-lowering therapies described in the National Cholesterol Education Program/Adult Treatment Panel III (NCEP ATP III) Guidelines.[15] If not contraindicated, statin-based therapy has shown a wide range of biological effects, such as reducing CRP.[16,17]

✓ **Assess blood pressure.**

- If not at optimal levels, consider initiating, or titrating antihypertensive therapy.[18]

✓ **Assess clotting risk.**

- Consider antiplatelet medication if history of coronary artery disease (i.e., myocardial infarction or revascularization) and/or a history of cerebrovascular disease (i.e., transient ischemic attack or stroke).[19,20]

Assess the presence of coronary artery disease with imaging techniques such as carotid intima-media thickness (CIMT) testing[21] or coronary artery calcium (CAC) scoring.[22]

✓ **Assess dental health (periodontal disease).**

- Refer to dentist to identify gum disease. Poor dental health may cause significant inflammation and is associated with the presence of atherosclerosis.[23,24]

** The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.*

† The treatment considerations are provided for informational purposes only and are not intended as medical advice. A physician's test selection and interpretation, diagnosis, and patient management decisions should be based on his/her education, clinical expertise, and assessment of the patient.

References

1. Gabay C and Kushner I. Acute-Phase Proteins and Other Systemic Responses to Inflammation. *N Engl J Med*. 1999; 340(6):448-454. 2. Ridker PM et al. Inflammation, aspirin, and the risk of cardiovascular disease in apparently healthy men. *N Engl J Med*. 1997; 336: 973-979. 3. Ridker PM et al. Comparison of C-reactive protein and low-density lipoprotein cholesterol levels in the prediction of first cardiovascular events. *N Engl J Med*. 2002; 347: 1557-1565. 4. Rost NS et al. Plasma concentration of C-reactive protein and risk of ischemic stroke and transient ischemic attack: The Framingham study. *Stroke*. 2001; 32: 2575-2579. 5. Ndrepepa G et al. N-terminal probrain natriuretic peptide and C-reactive protein in stable coronary heart disease. *Am J Med*. 2006; 119: 355.e1-355.e8. 6. Ridker PM et al. Antiinflammatory therapy with canakinumab for atherosclerotic disease. *N Engl J Med*. 2017; 377:1119-1131. 7. Nissen SE et al. Statin therapy, LDL cholesterol, C-reactive protein, and coronary artery disease. *N Engl J Med*. 2005; 352: 29-38. 8. Ridker PM et al. C-reactive protein levels and outcomes after statin therapy. *N Engl J Med*. 2005; 352: 20-28. 9. Ridker PM et al. Rosuvastatin to prevent vascular events in men and women with elevated C-reactive protein. *N Engl J Med*. 2008; 359: 2195-2207. 10. Pearson TA et al. Markers of Inflammation and Cardiovascular Disease Application to Clinical and Public Health Practice: a statement for healthcare professionals from the centers for disease control and prevention and the american heart association. *Circulation*. 2003; 107:499-511. 11. Ridker PM. A test in context: high-sensitivity c-reactive protein. *J Am Coll Cardiol*. 2016; 67(6):712-723. 12. Tkacova R et al. Systemic inflammation and systemic oxidative stress in patients with acute exacerbations of COPD. *Respir Med*. 2007; 101;1670-1676. 13. Milani RV et al. Reduction in c-reactive protein through cardiac rehabilitation and exercise training. *J Am Coll Cardiol*. 2004; 43(6):1056-1061. 14. Nicklas JM et al. Effect of dietary composition of weight loss diets on high sensitivity c-reactive protein: the randomized pounds lost trial. *Obesity*. 2013; 21(4):681-689. 15. Third report of the National Cholesterol Education Program (NCEP). Expert panel on detection, evaluation and treatment of high blood cholesterol in adults (Adult Treatment Panel III). *National Institutes of Health*. September 2002. NIH Publication No. 02-5215. 16. Albert MA, et al. Effect of statin therapy on C-reactive protein levels: the pravastatin inflammation/CRP evaluation (PRINCE): a randomized trial and cohort study. *JAMA* 2001; 286: 64-70. 17. Topol EJ. Intensive statin therapy -- a sea change in cardiovascular prevention. *N Engl J Med* 2004; 350: 1562-1564. 18. Ridker PM et al. Valsartan, blood pressure reduction, and c-reactive protein: primary report of the val-marc trial. *Hypertension*. 2006; 48:73-79. 19. Ridker PM et al. Inflammation, aspirin, and the risk of cardiovascular disease in apparently healthy men. *N Engl J Med*. 1997; 336(14):973-979. 20. Hajsadeghi S et al. Prasugrel results in higher decrease in high-sensitivity c-reactive protein level in patients undergoing percutaneous coronary intervention comparing to clopidogrel. *Clin Med Insights Cardiol*. 2016; 10:149-155. 21. Cao JJ et al. C-reactive protein, carotid intima-media thickness, and incidence of ischemic stroke in the elderly: the cardiovascular health study. *Circulation*. 2003; 108:166-170. 22. Möhlenkamp S et al. Quantification of coronary atherosclerosis and inflammation to predict coronary events and all-cause mortality. *J Am Coll Cardiol*. 2011; 57(13):1455-1464. 23. Buhlin K et al. Periodontitis is associated with angiographically verified coronary artery disease. *J Clin Periodontol*. 2011; 38: 1007-1014. 24. Marcaccini AM et al. Circulating interleukin-6 and high-sensitivity c-reactive protein decrease after periodontal therapy in otherwise healthy subjects. *J Periodontol*. 2009; 80:594-602.

QuestDiagnostics.com