Spotlight on Health

Advanced Testing for Cardiovascular Disease

Cholesterol is a substance in blood that can build up and clog arteries. This can lead to cardiovascular disease (disease of the heart and blood vessels), which can cause a heart attack or stroke. To stop this from happening, health care providers recommend keeping the cholesterol level low.[1] But many people who eat healthy, exercise, don't smoke, and have a low cholesterol level still have a heart attack or stroke.[1,2]

This newsletter will discuss the buildup of cholesterol in arteries. It will also discuss special "advanced" laboratory testing. Results of advanced testing may be used to see if a person with a normal cholesterol level is still likely to have a heart attack or stroke. These people can then talk to their healthcare provider about how to reduce the chances of having a heart attack or stroke.

Atherosclerosis and Heart Disease

Atherosclerosis is the buildup of "plaque" that clogs arteries.[1] Plaque is mainly made of cholesterol. You have probably heard of "good cholesterol" and "bad cholesterol." Plaques form when there is too much bad cholesterol and not enough good cholesterol.[1] They can become so thick in the arteries of the heart that they block blood flow. This can cause a heart attack. Plaques in other arteries can break off and travel to the brain. This can cause a stroke.

High blood pressure and smoking can both damage arteries and cause inflammation. Inflammation is the body's response to an injury.[4] If you cut yourself, the area becomes red and swollen. This is inflammation. When there is inflammation of the arteries, plaques can build up faster.[5]

Exercising, eating healthy, not smoking, and being a normal weight can all help lower bad cholesterol in the blood.[1,6] This helps stop plaques from forming and lowers the risk of a heart attack or stroke.[1,6] Drugs called statins are also used by many people to lower bad cholesterol levels.[1]

Some People With Low Cholesterol Are Still at Risk

Even people with normal levels of bad cholesterol may still be at risk. Half of the people who go to the hospital for clogged arteries in their heart have normal levels of bad cholesterol.[2] This can even happen in people who eat healthy, exercise, and don't smoke. Experts say these people have "residual risk."[1]

To learn more about a person's residual risk, health care providers may order advanced* laboratory tests.[7] One of these tests measures the size and number of particles in blood that carry good and bad cholesterol. Having a lot of small particles in blood that carry bad cholesterol is concerning. It may mean there is a greater chance of a heart attack or stroke.[7] Another test looks for a high level of risk marker called lipoprotein(a). About 1 in 5 people have this risk, which they inherit from their parents.[8] Other tests measure substances called inflammatory biomarkers. These are also linked to heart attack and stroke.[7]

Fats, Cholesterol, and Your Diet

You have probably heard about good fats and bad fats. Monounsaturated and polyunsaturated fats are good fats. When eaten in small amounts, they can help keep blood cholesterol low.[3] Saturated and trans fats are bad fats. They raise the amount of bad cholesterol in your blood.[3]

- Good fats are found in vegetable oils, certain fish, and other foods such as walnuts and olive oil.[3]

- Bad fats are found in meats, poultry skin, dairy products, and coconut and palm oil (oils common in junk foods).[3]

- Fruits, vegetables, and whole grains can help keep your bad cholesterol level low.[3]

What You Can Do

Eating healthy (see Sidebar on previous page) can lower the chance of a heart attack or stroke. Exercising and maintaining a normal weight are both important. Not smoking is very important. The Centers for Disease Control and Prevention website has information on how to live a healthy lifestyle (CDC.gov/cholesterol/prevention.htm).

How Your Healthcare Provider Can Help

Your healthcare provider may ask you about how much exercise you get, and what foods you eat. They may also ask you if a family member has had a heart attack or stroke. Your healthcare provider may also order blood tests to check your cholesterol level. If the cholesterol in your blood is high, they may recommend you get more exercise, eat better, and lose weight. They may also prescribe a statin. Based on your history, your healthcare provider may also order advanced blood tests to see if you have residual cardiovascular risk. If you have residual risk, your healthcare provider may recommend a drug other than a statin to help lower cholesterol.[9] Other medicines can lower the amount of fat in your blood, and this may also lower residual risk.[9]

How the Laboratory Can Help

Quest Diagnostics offers blood tests that measure good and bad cholesterol, and the number and size of the particles. Quest also offers tests for inflammatory biomarkers. These tests help find out if you are at risk of a heart attack or stroke.

Additional Information

For more information, visit QuestDiagnostics.com/home/patients/health-test-info/chronic-disease/heart-disease.html, or these helpful websites:

- Centers for Disease Control and Prevention: CDC.gov/heartdisease/index.htm
- WebMD: WebMD.com/cholesterol-management/guide/understanding-numbers#1
- American Heart Association: Heart.org/en/health-topics/cholesterol
- American Heart Association: Heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/inflammation-and-heart-disease

* Some of these tests are quite new, not everyone in the medical community has agreed on how useful these tests are. This often happens with new tests. Studies are ongoing to learn more about what the results mean for different people. These studies will help healthcare providers, and the medical community in general, decide how to best use these tests.

References

1. Arnett DK, Blumenthal RS, Albert MA, et al. 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease. *Circulation.* 2019. doi:10.1161/CIR.0000000000000678

2. Sachdeva A, Cannon CP, Deedwania PC, et al. Lipid levels in patients hospitalized with coronary artery disease: an analysis of 136,905 hospitalizations in Get With The Guidelines. *Am Heart J.* 2009; 157:111-117.e2.

3. Zelman KM. The skinny on fat: good fats vs. bad fats. WebMD website. https://www.webmd.com/diet/obesity/features/skinny-fat-good-fats-bad-fats#1. Accessed July 2, 2019.

4. Inflammation and heart disease. American Heart Association website. https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/inflammation-and-heart-disease. Updated July 31, 2015. Accessed July 22, 2019.

5. Raggi P, Genest J, Giles JT, et al. Role of inflammation in the pathogenesis of atherosclerosis and therapeutic interventions. *Atherosclerosis.* 2018;276:98-108.

6. Kromhout D, Menotti A, Kesteloot H, et al. Prevention of coronary heart disease by diet and lifestyle: evidence from prospective cross-cultural, cohort, and intervention studies. *Circulation.* 2002;105:893-898.

7. Davidson MH, Ballantyne CM, Jacobson TA, et al. Clinical utility of inflammatory markers and advanced lipoprotein testing: advice from an expert panel of lipid specialists. *J Clin Lipidol.* 2011;5:338-367.

8. Tsimikas S, Fazio S, Ferdinand KC, et al. NHLBI Working Group recommendations to reduce lipoprotein(a)-mediated risk of cardiovascular disease and aortic stenosis. *J Am Coll Cardiol.* 2018;71:177-192.

9. Shapiro MD, Fazio S. From lipids to inflammation: new approaches to reducing atherosclerotic risk. *Circ Res.* 2016;118:732-749.