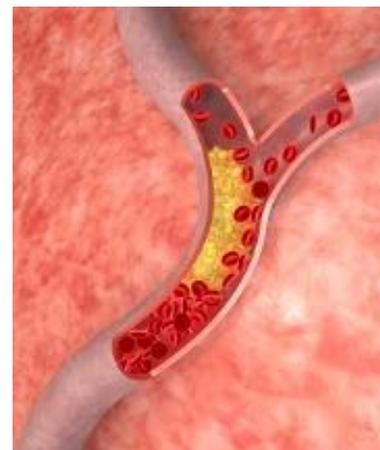


Terminology - What is:

- Atherosclerosis – disease in which plaques (made up of fat, cholesterol, calcium, and other substances) builds up in the arteries and narrows them, and can eventually lead to an atherosclerotic cardiovascular disease (ASCVD) event.
- ASCVD– includes heart attack, ischemic stroke, transient ischemic attack (TIA), peripheral arterial disease (PAD), stable or unstable angina (e.g., chest pain). CVD is a more broad term that includes cardiovascular diseases that are not caused by atherosclerotic disease rheumatic heart disease and cardiomyopathy.
- Major Types of Cholesterol
 - Low Density Lipoprotein (LDL) or "bad" cholesterol - derived from de novo synthesis and absorption from the diet
 - High Density Lipoprotein (HDL) or "good" cholesterol - helps reduce risk for heart disease by removing the LDL-C from the blood and helping to keep blood vessels clean and healthy.
 - Triglycerides (TG) are derived from dietary fatty acids and synthesized in the liver. TG are carried within a variety of lipoproteins
- Lipid Profile – panel of blood tests that measure levels of total cholesterol, LDL-cholesterol, HDL-cholesterol, and triglycerides.
- Dyslipidemia – patterns of abnormal lipid levels (numbers outside of recommended ranges) including low HDL and elevated LDL or triglyceride concentrations
- Familial Hypercholesterolemia – a genetic disorder passed through families that causes LDL cholesterol to be very high and may cause ASCVD events at an early age.



Role of Cholesterol in Health

Cholesterol is essential for all cells. It is a major structural component of cell membranes and a substrate for biosynthesis of other steroids (hormones), bile acid, and vitamin D. Triglycerides are the major constituents of body fat and skin oils. Cholesterol is made by the body and absorbed from animal-based foods.

Atherosclerosis is a buildup of plaque which narrows arteries and can eventually lead to an ASCVD event. Most people begin to have plaque build-up in their arteries in their 20s and 30s, but this process takes many years and may not have many symptoms to indicate a problem.

Approximately 38% of adults have total blood cholesterol levels higher than 200 mg/dL and almost 12% have levels higher than 240 mg/dL. In the U.S., 1 in 3 adults have high levels of LDL cholesterol and nearly 1 in 5 adults have low levels of HDL cholesterol.

Risk Assessment: how do you know if someone is at risk for ASCVD events?

Assessing risk should begin with patient-provider discussions and screening or getting a lipid panel to examine blood cholesterol levels. In healthy adults without risk, cholesterol levels should be checked every 4-6 years. Cholesterol should be checked more frequently in adults with CVD or who are taking cholesterol lowering medications.

Health care providers can use online ASCVD risk calculators to estimate 10-year ASCVD risk static.heart.org/riskcalc/app/index.html#!/baseline-risk. Certain conditions and behaviors may increase your risk. The best treatment option for each person depends on risk as well as other factors such co-morbid conditions or other medications.

NACDD and CDC Fireside Chat: Cholesterol and Cholesterol Management

Thursday, February 28, 2019

Patient Management Groups

1. Secondary ASCVD Prevention
2. Severe Hypercholesterolemia (LDL \geq 190 mg/dL)
3. Diabetes Mellitus in Adults 40-75 years of age with LDL-C 70-189 mg/dL
4. Primary Prevention Over the Lifespan

Management of Cholesterol Levels:

There are currently no ideal or guideline recommended targets for blood cholesterol levels. However, the 2018 guidelines suggest that “lower is better” and studies suggest that adults with total cholesterol levels below 150 mg/dL or LDL-C \leq 100 mg/dL have lower rates of Heart Disease and Stroke.

1. Lifestyle is key!
 - a. Healthy Diet (<https://health.gov/dietaryguidelines/>)
 - b. Recommended levels of Physical activity (<https://www.cdc.gov/physicalactivity/basics/index.htm>)
 - c. Healthy weight (<https://www.cdc.gov/healthyweight/index.html>)
2. Medication management
 - a. Statins –lower LDL cholesterol by reducing the liver’s production of cholesterol. They also improve the liver’s ability to remove LDL cholesterol that is already in the blood.
 - b. Non-statin add-on drugs to Statin Therapy
 - i. Ezetimibe - reduces blood cholesterol by limiting the absorption of cholesterol by the small intestine. This reduces how much cholesterol travels from the intestine to the liver, lowering the amount of cholesterol that is stored in the liver and increasing the amount of cholesterol cleared from the blood.
 - ii. Bile-acid sequestrants – block the absorption of bile acid in your stomach into your blood. Your liver bile acids and so makes more by breaking down LDL cholesterol in your blood.
 - iii. PCSK9-inhibitors - The PCSK9 protein helps determine how much cholesterol is absorbed by the liver. PCSK9 inhibitor medications allow the liver to absorb more cholesterol from the blood.

Additional References:

1. <https://www.cdc.gov/cholesterol/index.htm>
2. https://www.cdc.gov/cholesterol/treating_cholesterol.htm
3. <https://millionhearts.hhs.gov/tools-protocols/tools/cholesterol-management.html>
4. <https://www.nhlbi.nih.gov/health-topics/atherosclerosis>
5. <https://millionhearts.hhs.gov/learn-prevent/scoop-on-statins.html>)
6. Grundy SM, Stone NJ, Bailey AL, et al. 2018 ACC/AHA/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2018;<https://www.professional.heart.org/cholesterol>
<https://www.hhs.gov/disclaimer.html>
7. American college of Cardiology. 2018 Guidelines on the Management of Blood Cholesterol: Guidelines Made Simple. <https://www.acc.org/~media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Guidelines/2018/Guidelines-Made-Simple-Tool-2018-Cholesterol.pdf>