Cholesterol

the Advocacy Alliance

Health Care Quality Units

Disclaimer:

- The information presented today is to increase your awareness of these physical and/or behavioral health conditions or situations. It is not intended to replace advice or instruction from your health care practitioner or your agency policy.

Objectives:

The learner will understand:

- Cholesterol and hypercholesterolemia by definition.
- High density and low density lipoproteins and triglycerides.
- Diagnostic testing, goals, and elevated cholesterol .
- Healthy lifestyle choices and medications.
- Warning signs of a heart attack.

Overview: The Silent Risk Factor

- Cardiovascular Disease kills more people every year than any other illness.
- One of the major risk factors for this deadly disease is elevated cholesterol.
- There are typically no warning signs of elevated cholesterol levels.

Cholesterol

- One of two major fats found in the blood, is called lipids.
- Soft, waxy appearance.
- Necessary for building cell walls, vitamin D and some hormone production.
- Helps create bile salts to aid in digestion of fats.

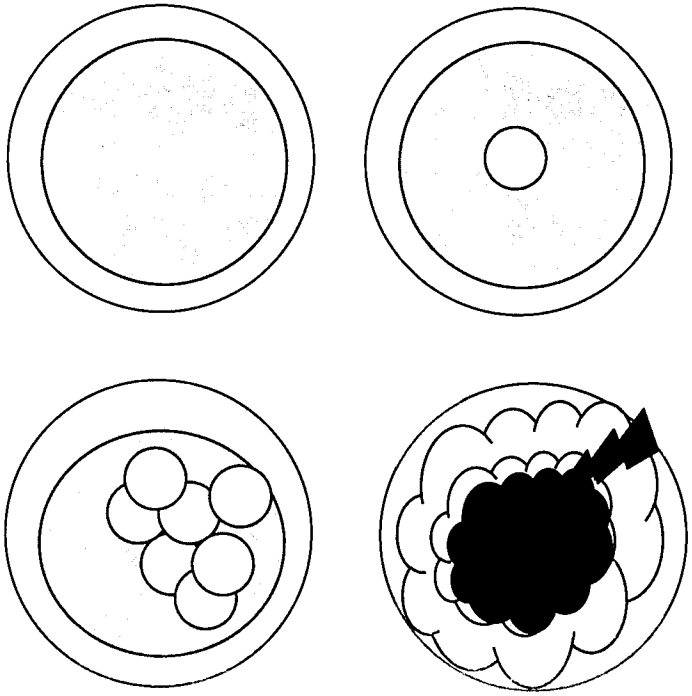
Cholesterol

- The liver produces enough cholesterol daily to maintain bodily function (800-1500mg).
- Cholesterol is also obtained via intake of animal food sources:
  - Eggs
  - Meats
  - Whole fat dairy products

Hypercholesterolemia

- Medical term for too much cholesterol in the blood.
- Excess blood cholesterol slowly builds up in artery walls forming scar tissue and plaque.
- Plaque build up is referred to as atherosclerosis.
- These plaques harden making the arteries more narrow and rigid.
- Eventually, the artery may tear and cause a blood clot to form .
- The blood clot can block blood flow destroying tissue, or may travel to the heart or brain.

An example of what atherosclerosis



Lipoproteins

The combination of the fatty cholesterol and the protein is called lipoproteins.

The two most important types of lipoproteins are:

- HDL-High Density Lipoprotein.
- LDL- Low Density Lipoprotein.

High Density Lipoprotein (HDL)

- HDL is protein with small amounts of cholesterol.
- Considered "good" cholesterol because HDL removes cholesterol from the walls of arteries and carries HDL to the liver for elimination by the body.
- Elevated HDL levels protect against cardiovascular disease.

HDL Risk Level	**HDL CHOL Level**
Bad result - major risk for heart disease	Less than **40** mg/dl
Good result - protection from heart disease	**60** mg/dl and above

Low Density Lipoprotein (LDL)

- LDL typically contains a large amount of cholesterol and small amount of protein.
- LDL increases disease risk by depositing cholesterol on the artery walls.
- Doctors are most concerned about LDL.

LDL Risk Level	LDL CHOL Level
Optimal	Less than 100mg/dl
Near Optimal	100-129 mg/dl
Borderline High	130-159 mg/dl
High	160-189 mg/dl
Very High	190 mg/dl and >

Triglycerides

- Excess calories consumed, turn into triglycerides which are stored in fat cells for later use as energy.
- If one regularly consumes more calories than he/she body uses, elevated triglycerides result.
- Individuals with high triglyceride levels often have other disease processes, such as diabetes and obesity.
- Triglycerides are part of the blood test that measures cholesterol.

Risk Level	Blood Value
Normal	Less than 150mg/dl
Borderline-High	150-199 mg/dl
High	200-499 mg/dl
Very High	500 mg/dl or higher

*Fasting levels

Diagnostic Testing

- A lipid profile is a blood test to detect fat levels to assess the risk for heart disease.
- Total cholesterol, HDL, LDL, and Triglycerides are blood tests to assess heart disease.
- Fasting 8-12 hours prior to lab test is usually the guideline to assure accurate readings.
- Everyone should have their cholesterol checked beginning at age 20 and at least every 5 years thereafter.
- Adolescents and children with a family history of early heart disease or very high cholesterol levels, may need to be tested.

Cholesterol Goals

- Total Cholesterol - less than 200.
- LDL - less than 100.
- HDL - 60 or more.
- Triglyceride - less than 150.
- Individuals with diabetes have stricter goals.

Causes of Elevated Cholesterol

- Poor diet.
- Excess weight.
- Lack of exercise.
- Age.
- Heredity.

Causes of Elevated Cholesterol

- Type 2 Diabetes.
- Stress.
- Hypothyroidism.
- Kidney Disease.
- Liver Disease.
- Medications such as steroids.
- Polycystic Ovarian Syndrome.

Healthy Lifestyle Choices

- Select foods low in cholesterol, saturated, and trans fats.
- Strive to incorporate 30-60 minutes of exercise into your daily routine 5-7 days per week.
- Lose weight if you are overweight.
- Do not smoke.
- Have routine check ups with your physician, expect cholesterol testing.

Know Your Dietary Fat Facts:

Saturated Fat

- Main dietary cause of high cholesterol.
- Found in food from animal sources and a few plant sources.
- Often solid at room temperature.

Trans Fat/Hydrogenated Fat

- Unhealthy substance made when hydrogen is added to oil to solidify it, improve flavor and increase shelf life.
- Abundant in fried foods as hydrogenation makes oil able to be deep fried.
- Known to increase LDL or "bad" cholesterol leading to clogged arteries, heart attack and stroke.

Polyunsaturated and Monounsaturated Fats

- Found mainly in nuts, fish, seeds, and plant oils.
- Food examples include salmon, avocado, olives, walnuts, and almonds.
- Oils containing these include olive, sunflower, safflower, and canola.
- Help lower LDL (bad cholesterol) and raise HDL (good cholesterol).

Read Food Labels

1. Start Here
2. **Check Calories**
3. Limit these Nutrients
4. Get Enough of these Nutrients
5. **Footnote**

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

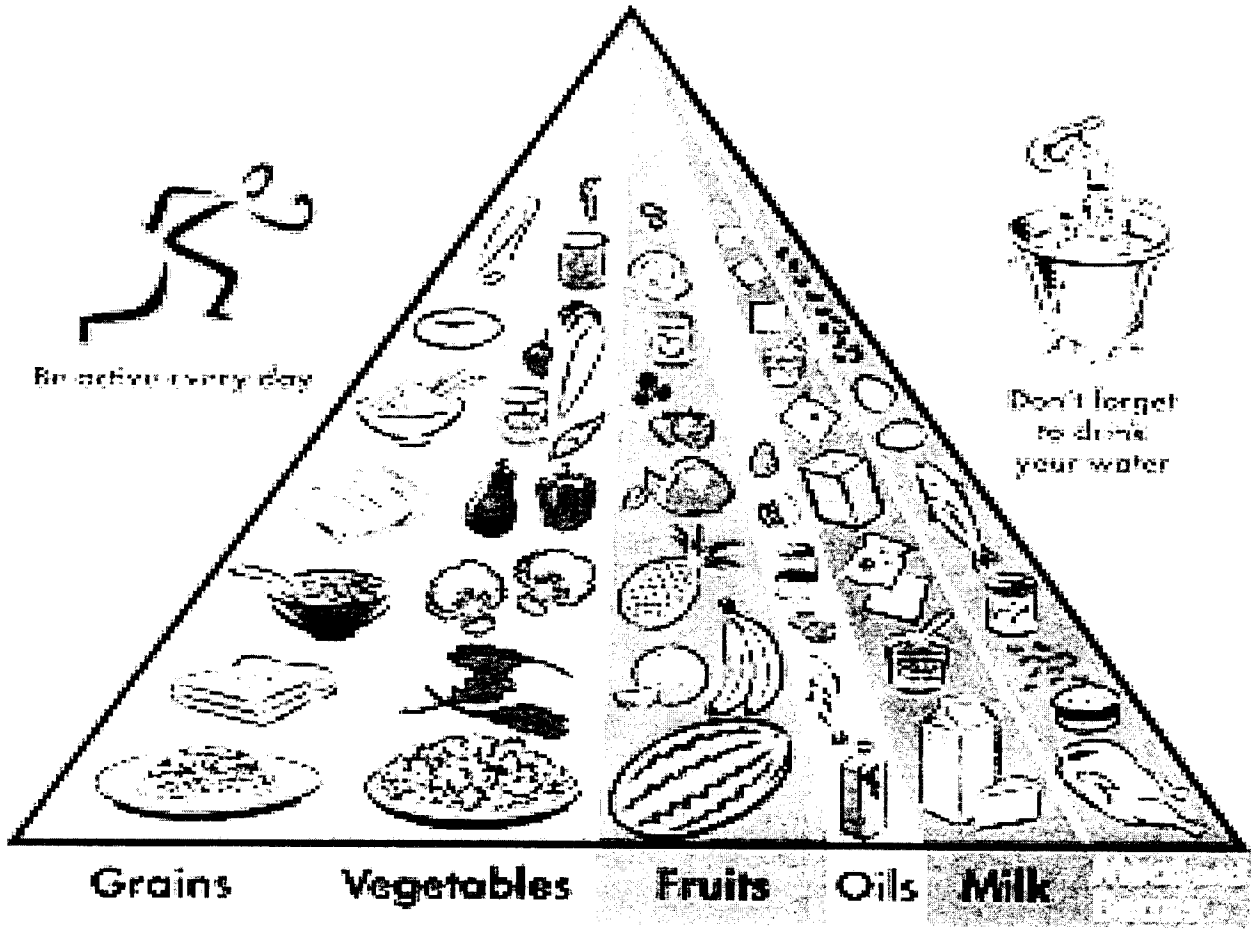
Calories 250	Calories from Fat 110
	% Daily Value*
Total Fat 12g	**18%**
Saturated Fat 3g	**15%**
Trans Fat 3g	
Cholesterol 30mg	**10%**
Sodium 470mg	**20%**
Total Carbohydrate 31g	**10%**
Dietary Fiber 0g	**0%**
Sugars 5g	
Protein 5g	
Vitamin A	**4%**
Vitamin C	**2%**
Calcium	**20%**
Iron	**4%**

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

- 5% or less is Low
- 20% or more is High

Current Food Pyramid



Encourages Eating From All The Food Groups

Nutritional Recommendations

- Consume whole grains, such as whole wheat flour as the first ingredient of bread.
- Avoid high fructose corn syrup.
- Avoid long word ingredients.
- Consume the fruit over the juice.
- Consume fatty fish or supplement Omega 3 Fatty Acids.

Weight Loss Tips

A decrease of 5-15% of body weight will reduce disease risk, especially for heart disease and diabetes.

- Use BMI chart to determine healthy weight goal.
- Plan gradual weight loss.
- Decrease calories intake.
- Increase calories output.
- Commit to healthy eating forever.
- Control portions.
- Use Food Pyramid as guide at www.mypyramid.gov
- Eat often brightly colored fruits and vegetables.
- Increase fiber and WHOLE grains.
- Use 1% or skim milk products.
- Select more fish and lean meats.
- Limit saturated and trans fats to as few as possible.
- Limit alcohol intake.

Avoid Smoking

- Smoking is one of six controllable risk factors for heart disease.
- Exposure to smoke increases risk for heart disease, even for non-smokers.
- Smoking lowers HDL.
- Smoking decreases activity tolerance for exercise.
- The risk of Coronary Artery Disease and Stroke decreases by half, 1 year after smoking cessation.

Medications

- **Statins**- work in the liver to prevent the formation of cholesterol.
- **Selective Cholesterol Absorption Inhibitors**- prevent cholesterol absorption in the intestine.
- **Resins**-increase the disposal of LDL in the intestine.
- **Fibrates-**primarily used to lower triglycerides.
- **Niacin**- affects production of blood fats in the liver.

Warning Signs of a Heart Attack

- **Chest discomfort.**

  Most heart attacks involve discomfort in the center of the chest that lasts for more than a few minutes, or goes away and comes back. The discomfort can feel like uncomfortable pressure, squeezing, fullness, or pain.

Warning Signs of a Heart Attack

- **Discomfort in other areas of the upper body.** Can include pain or discomfort in one or both arms, the back, neck, jaw, or stomach. Women may have these atypical signs.
- **Shortness of breath.** Often comes along with chest discomfort, but can occur before chest discomfort.

Warning Signs of a Heart Attack

- **Other symptoms.** May include breaking out in a cold sweat, nausea, or light-headedness.

- Even if you're not sure it's a heart attack, you should still have it checked out. Fast action can save lives – maybe your own.

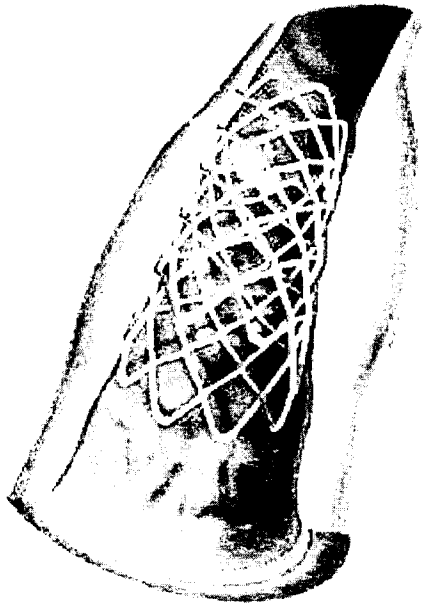
Coronary Angioplasty (PTCA)

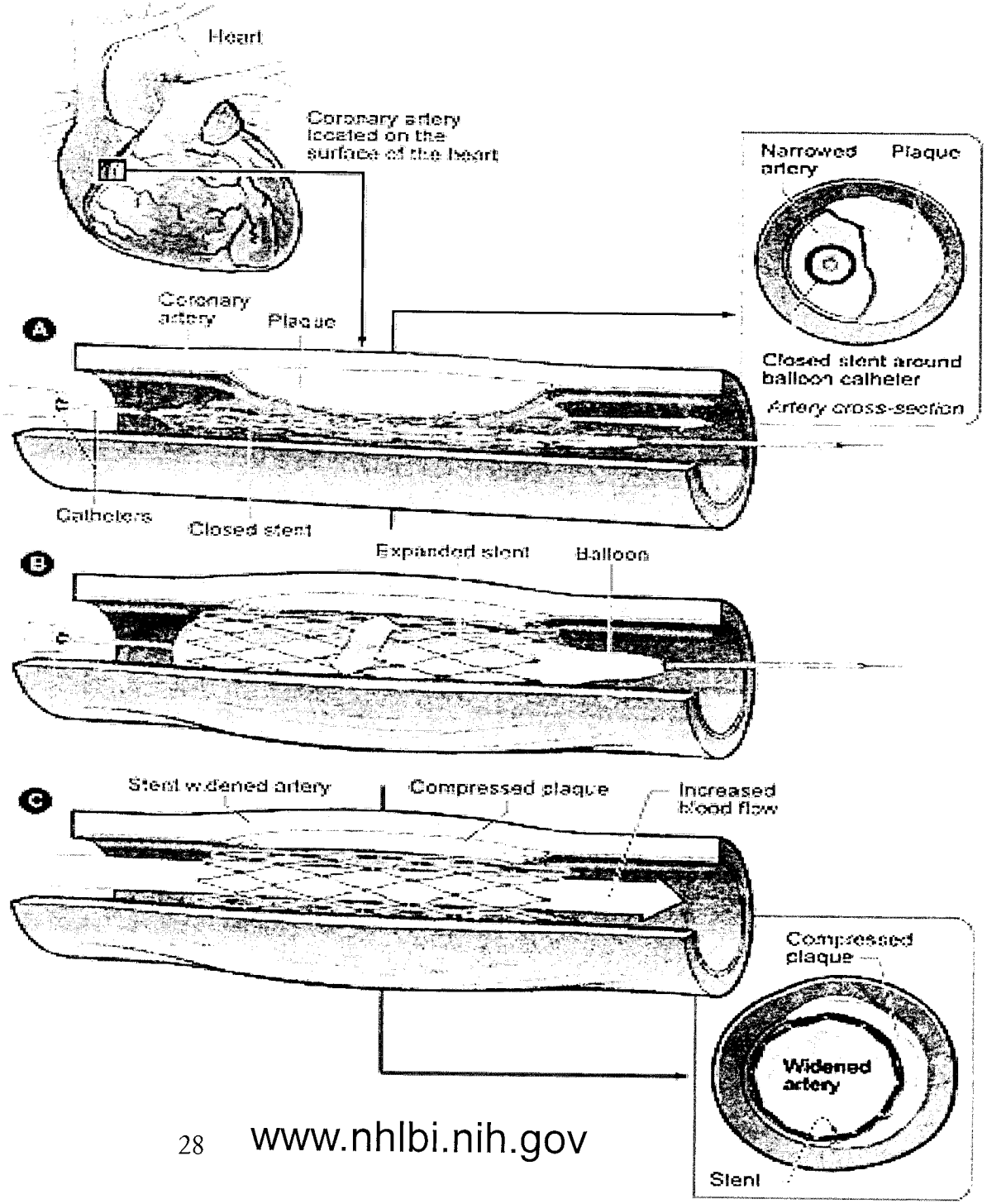
- PTCA (percutaneous transluminal coronary angioplasty) is a minimally invasive procedure used to dilate (widen) narrowed coronary arteries. A doctor inserts a catheter with a deflated balloon at its tip into the narrowed part of the artery. Then the balloon is inflated, compressing the plaque and enlarging the inner diameter of the blood vessel so blood can flow more easily. Then the balloon is deflated and the catheter removed. Stents are often placed after PTCA is performed.

- w *ww.bostonscientific.com*

Balloon and Stent

Stent in place





www.nhlbi.nih.gov

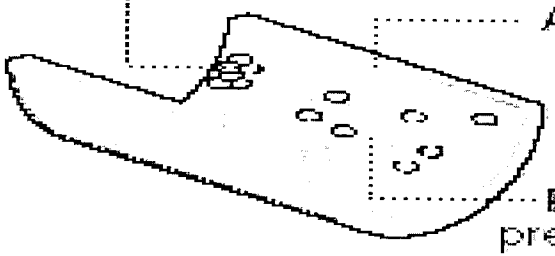
Options

Options to prevent heart attacks

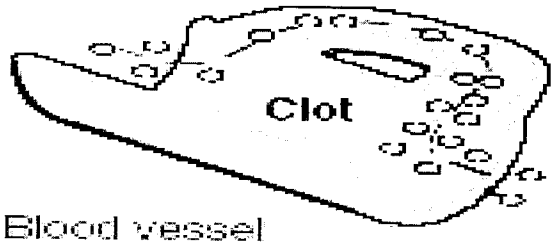
Blocked arteries causing chest pains or heart attacks are usually treated with bypass surgery or balloon angioplasty. But doctors are worried about the safety of drug-coated stents used in angioplasty to prop blood vessels open.

Medication

Blood platelets can stick together leading to clots



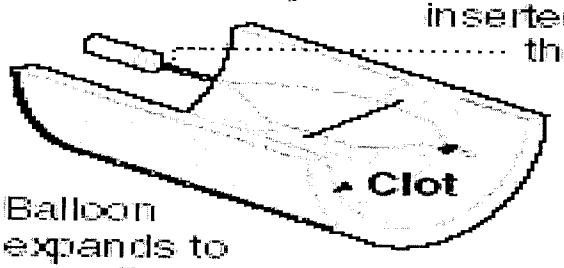
Bypass



Blood vessel from another part of the body is used to make a path around a clot

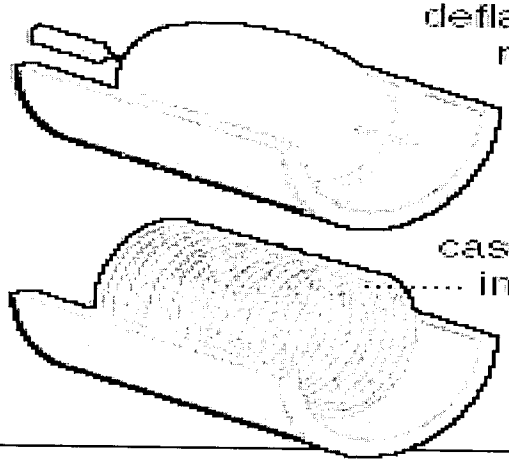
Angioplasty

Catheter inserted into the clot



Balloon expands to open the clot ...

... then it's deflated and removed



Stent
In most cases is put in to keep the path open

SOURCE: American Heart Association

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