Conquering Cholesterol and Heart Disease

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Michael D. Banas, MD
Katie Manis, MS, RD, CDN, CNSC
Prevention of Heart Disease

Michael Donald Banas, MD
FACC, FAHA, FASE, FASNC, RPVI
Background

- Heart disease is a lifelong condition
- Once damaged, the heart, its arteries, its valves, and its electrical system remain damaged
- Heart disease can be controlled
- Reduce risk of development
- Reduce risk of progression
- Improve chances of living a longer, healthier life
- The sooner you get started, the better your chances
Prevention of Heart Disease

• **Primary Prevention** – Avoiding the development of disease

• **Secondary Prevention** – Detecting a disease early, thereby increasing opportunities to prevent progression of the disease and emergence of symptoms

• **Tertiary Prevention** – Reducing the negative impact of an already established disease by restoring function and reducing complications
What is Heart Disease?

• Congestive Heart Failure
• Arrhythmias (abnormal heart rhythm)
• High Blood Pressure
• Arterial Heart Disease
What is Heart Disease?

- Congestive Heart Failure – Reduced ability of the heart to deliver blood throughout the body
  - Heart Weakness (Cardiomyopathy)
  - Valvular Heart Disease
  - Pericardial Heart Disease
  - Stiffened Heart (Diastolic Dysfunction)
  - Arrhythmias (abnormal heart rhythm)
What is Heart Disease?

**Systolic Heart Failure**
- Less blood pumped out of ventricles
- Weakened heart muscle can't squeeze as well

**Normal Heart**

**Diastolic Heart Failure**
- Less blood fills the ventricles
- Stiff heart muscle can't relax normally
What is Heart Disease?
What is Heart Disease?

• Arrhythmias (abnormal heart rhythm)
  – Atrial fibrillation
    • Affects 2.2 million Americans
    • Increased risk of stroke
  – Atrial flutter, SVT
  – Ventricular fibrillation
    • Prevents heart from effectively pumping blood
What is Heart Disease?
What is Heart Disease?

• Arterial Heart Disease – Disease of the arteries of the heart due to cholesterol and inflammatory tissue leading to blood clot formation
  – Angina (Stable and Unstable)
  – Acute Coronary Syndrome
  – Heart Attack (Myocardial Infarction)
What is Heart Disease?
Cholesterol and Heart Disease

• Cholesterol
  – Naturally occurring
  – Produced in liver
  – Needed by cells to maintain their structure
  – Consumed when we eat fat (more with animal fat)
  – Carbohydrates also increase cholesterol levels
    • Carbohydrates are broken down into sugars in body
    • Sugars are used for energy or stored as fat
    • Refined carbohydrates high in sugar and low in fiber are most unhealthy
Cholesterol and Heart Disease

- Cholesterol
  - HDL (High-Density Lipoprotein)
    - “Good” cholesterol
  - LDL (Low-Density Lipoprotein)
    - “Bad” cholesterol
  - Triglycerides
    - Main constituent in body fat in humans and animals; also present in vegetable fat
    - Main function is to store energy for later use
    - Provide your body with energy by also traveling throughout the blood
Cholesterol and Heart Disease

Total Cholesterol

HDL “Good” cholesterol + LDL “Bad” cholesterol + Triglycerides = Total cholesterol score
Cholesterol and Heart Disease

• Too much cholesterol raises risk for heart disease
  – Too much “bad” cholesterol
  – Not enough “good” cholesterol

• Builds up on artery walls (plaque), restricting blood flow and straining the heart

• Plaque can break away and cause heart attack or stroke

• Blood clot can form on ruptured plaque blocking arteries
Cholesterol and Heart Disease

A Normal artery

- Normal blood flow
- Artery wall

B Narrowing of artery

- Abnormal blood flow
- Plaque
- Artery cross-section

Narrowed artery
- Plaque
Cholesterol and Heart Disease

• People with high total cholesterol have about twice the risk for heart disease as people with ideal levels

• About one in four deaths in U.S. (~610,000 annually) due to heart disease

• Someone in the U.S. has a heart attack every 43 seconds, and every minute someone dies from a heart-related event
Controllable Risk Factors

- Smoking
- Overweight
- Sedentary lifestyle
- High blood pressure
- Low HDL or “good” cholesterol
Uncontrollable Risk Factors

• Age
  – 55+ for women
  – 45+ men

• Family history
  – Father/brother had heart disease before age 55
  – Mother/sister had heart disease before age 65
Cholesterol and Heart Disease

• The more risk factors you have, the greater your chance of developing heart disease
• Only 5 percent of the population has a genetic tendency toward heart disease
• This means that you can positively influence 95 percent of your risk for heart disease and stroke!
## Controlling Your Risk Factors

### What's Your Number?

#### Blood Cholesterol Levels for Preventing Heart Disease

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<td>190 and above</td>
<td>Very high</td>
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You and Your Doctor: A Healthy Partnership

• Speak up

• Be open

• Keep it simple
Conquering Heart Disease and High Cholesterol

- Know your numbers
- Lifestyle changes
- Medications, if needed
Conquering Heart Disease and High Cholesterol

• Simple blood cholesterol test
• How often to check
  – Adults who don’t have heart disease
    • Every five years
    • Begin at age 20
  – Adults with risk factors check more frequently
    • Total cholesterol > 200 mg/dL
    • HDL < 40 mg/dL
    • Age (man 45+, woman 50+)
    • Heart disease
Controlling Your Risk Factors

ABCs of Preventing Heart Disease

Avoid Tobacco
- Tobacco smoke
- Stress
- High blood pressure
- High blood cholesterol

Be More Active
- Physical inactivity
- Stress
- High blood pressure
- High blood cholesterol
- Obesity

Choose Good Nutrition
- Alcohol
- Stress
- High blood pressure
- High blood cholesterol
- Diabetes mellitus
- Obesity
Controlling Your Risk Factors

• Lower your cholesterol
  – Causes plaque build up in the heart’s arteries

• How to lower your cholesterol
  – Diet
  – Medication
Controlling Your Risk Factors: Smoking

- Causes arteries to constrict
- Raises blood pressure
- Reduces oxygen levels in the blood
- Effects of quitting are seen immediately
- Methods to quit
  - Nicotine supplements
  - Zyban
  - Chantix
  - Support
Controlling Your Risk Factors: Blood Pressure

• High Blood Pressure
  – Caused by
    • Kidney disease
    • Adrenal gland disease
    • Hardening of the large arteries
  – Usually does not cause symptoms
  – Increases risk of heart attack and stroke
Controlling Your Risk Factors: Blood Pressure

Blood Pressure: How High Is High?

Your blood pressure category is determined by the higher number of either your systolic or your diastolic measurement. For example, if your systolic number is 115 but your diastolic number is 85, your category is prehypertension.

- **Normal blood pressure**: Less than 120 and less than 80
- **Prehypertension**: 120–139 or 80–89
- **High blood pressure**: 140 or higher or 90 or higher
Physical Activity

• Exercise/weight loss
  – Physical inactivity and obesity are major risk factors for heart disease
  – Walking, swimming, cycling, jogging, aerobic dancing
  – 30 minutes per day, 5 days per week
Physical Activity

- Aerobic activity
  - Uses large muscles
  - Increases oxygen in blood
  - Makes heart beat faster, so more blood flows to muscles and lungs
  - 30 minutes most days or 150 minutes per week

- Strength training
  - Builds strong bones and muscles
  - Two to three times weekly on non-consecutive days

- Flexibility training
  - Increases flexibility
  - Improves balance and helps prevent injury
Controlling Your Risk Factors: Weight

**BODY MASS INDEX**

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* Weight is measured with underwear but not shoes.

**What Does Your BMI Mean?**

**Categories:**

**Normal weight:** BMI = 18.5-24.9. Good for you! Try not to gain weight.

**Overweight:** BMI = 25-29.9. Do not gain any weight, especially if your waist measurement is high. You need to lose weight if you have two or more risk factors for heart disease and are overweight, or have a high waist measurement.

**Obese:** BMI = 30 or greater. You need to lose weight. Lose weight slowly—about 1/2 to 2 pounds a week. See your doctor or nutritionist if you need help.
Controlling Your Risk Factors

• Other factors
  – Stress
    • Heart attacks are usually triggered by emotionally upsetting event
    • Many ways of coping with stress in and of themselves contribute to heart disease
  – Alcohol
    • Small amount may be beneficial
    • Large amounts can actually poison the heart
Controlling Your Risk Factors

• Illnesses associated with heart disease
  – Diabetes
    • If you have diabetes, you have the same high risk for heart attack as someone who has heart disease itself
  – Sleep apnea
    • Associated with greater likelihood of heart attack, diabetes, stroke, congestive heart failure
Getting Tested for Heart Disease

- Physical exam
- Electrocardiogram (EKG)
- Treadmill stress test
- Nuclear scan (with or without treadmill)
- Echocardiogram, arterial ultrasound
- Coronary angiogram / Ventriculogram
- Electrophysiologic Study
- Cardiac CT scan
- Cardiac MRI
Secondary Medical Treatments

• Medications
  – Aspirin – reduces platelet clumping
  – Plavix – also affects platelets
  – Anti lipid medication (statins, fibrates, others)
  – Blood pressure medication (now not just for blood pressure)
    • Beta-blockers
    • Ace inhibitors / Angiotensin blockers
    • Diuretics
Tertiary Medical Treatments

• Medications
  – Aspirin
  – Anti lipid medication
  – Blood pressure medication
  – Many others

• Angioplasty

• EP Ablation

• Surgical procedures
  – Bypass
  – Valve surgery
  – Pacemaker
Top 10 Heart Healthy Tips

1. Learn to read food labels so you can make smart food choices
2. Quit smoking
3. Know your numbers. Get your cholesterol levels checked
4. Maintain a healthy weight
5. Move. Try to be physically active 30 to 60 minutes most days
6. Maintain your blood pressure at or below 120/80 mmHg
7. Manage your stress
8. Get an adequate amount of sleep daily
9. Don’t stop taking cholesterol-lowering medications without first talking to your physician
10. Know your family history for heart disease
Cholesterol and Nutrition

Katie Manis, MS, RD, CDN, CNSC
Clinical Dietitian
Kaleida Health
Objectives

• Understand the types of cholesterol
• Determine what to avoid to help lower cholesterol
• Determine what to eat to help lower cholesterol
Types of Cholesterol

Low Density Lipoprotein (LDL)
• Carries cholesterol to tissues
  • Higher the level in the blood the higher heart disease risk factor

High Density Lipoprotein (HDL)
• Carries cholesterol away from tissues to the liver
  • Lower the level in the blood the higher heart disease risk factor
Sources of Cholesterol

- Foods of animal origin
  - Beef
  - Liver and organ meats
  - Egg yolks (not the whites)
  - Shrimp
  - Whole milk dairy products
2015 Dietary Guidelines

US Department of Health and Human Services
US Department of Agriculture

Scientific Report of the
2015 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Health and Human Services
and the Secretary of Agriculture

– No appreciable relationship between consumption for dietary cholesterol and serum cholesterol. Cholesterol is not a nutrient of concern for overconsumption
Weight

• Being overweight, especially abdominal obesity, tends to:
  • Increase LDL levels
  • Raise triglycerides
    • High triglycerides result in lower HDL
“The healthiest part of a donut is the hole. Unfortunately, you have to eat through the rest of the donut to get there!”
Physical Activity

• Regular activity
• Raises HDL
• Lowers triglycerides
• Promotes weight loss
  • Helps lower LDL
2015 Dietary Guideline Recommendations

• Strong and consistent evidence: Replace saturated fatty acids (SFA) with unsaturated fatty acids, especially polyunsaturated fatty acids, significantly lower total cholesterol and LDL cholesterol
  – If you replace SFA with carbohydrates, then total cholesterol and LDL cholesterol is lowered **but** triglycerides increase and HDL decreases

• Replacing SFA with polyunsaturated fatty acids decreases risk of cardiovascular disease events and coronary mortality

• Optimizing the **type of dietary fat** not reducing total fat is recommended
Total Fat

• Not all fats raise cholesterol, important to know which type

• Fat is calorie dense, can effect your weight when eaten in large amounts
The diversity of fats. Fats contain a mix of saturated and unsaturated fatty acids. Depending on which type of fatty acid is most prevalent, the fat is classified as saturated, monounsaturated, or polyunsaturated.
Saturated Fat

• Raises your blood cholesterol (LDL) more than anything else in your diet
• Americans eat an average of 11% of total calories
• Goal: Less than 7% of total calories
• Solid at room temperature
• Greatest sources are animal
  • Fatty meats, poultry with skin, whole milk dairy products, lard, coconut oil, palm oil
Coconut Oil

• One of the richest sources of saturated fats
  • Almost 90% saturated fats
    • Medium chain triglycerides (MCT)
      • The specific MCT fatty acid studied is not in coconut oil
  • Few human studies but show decreased waist circumference
Trans Fat

- Found in foods that have been hydrogenated
- Manipulate unsaturated fats to make it more stable and solid at room temperature
- Stick margarine, baked products (cookies, crackers, doughnuts)
- Required on the “nutrition facts” label
  - Be sure to look at ingredients
    - Hydrogenated or partially hydrogenated
Triglycerides

- Causes of high triglycerides
  - Overweight/obesity
  - Physical activity
  - Cigarette smoking
  - Excess alcohol intake
  - Diet high in carbohydrates
Unsaturated Fats

- Liquid at room temperature
- Monounsaturated: olive, canola, peanut oils
- Polyunsaturated: safflower, sunflower, corn, soybean oil
  - Nuts, also some in soy and avocado
  - Omega – 3 fatty acids: fatty fish, walnuts, flaxseed
    - Salmon, tuna, mackerel
  - Do not effect LDL levels, but may protect in other ways
Fiber

• Comes from plants
• Cannot be digested
• Does not give nourishment to our bodies
• Good for digestive tract and cancer prevention
• Usually low in calories
• Helps you feel full
Types of Fiber

- Insoluble fiber, “roughage”
  - Functions mainly in colon health
  - Whole grains, fruits with skins, vegetables, legumes
- Soluble fiber
  - Dissolves into a gel-like substance
  - Blocks cholesterol and fats from being absorbed
  - Whole grains, fruits with skins, vegetables, legumes
  - Increase 5-10 grams a day results in ~5% drop in LDL
Ways to Increase Fiber

- Choose whole grains cereal
- Add fruit to cereals
- Eat whole fruit rather than juice
- Add beans to salad
- Try going meat free one night a week

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<td>Pear</td>
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<tr>
<td>Brussel Sprouts</td>
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Plant Stanols and Sterols

- Naturally occurring in small amounts in many plants
- Taken from soybean and tall pine tree oils and supplemented into foods
- Helps block the absorption of cholesterol from the digestive tract
  - EVEN in vegetarians and vegans!
- Lowers LDL, does not effect HDL
- 2gm reduces LDL cholesterol by 5-15%
Phytosterols

- Listed on the label as plant sterols or stanols
  - Some use brand names: Reducol, Cardioaid, Cholestatin
- Can be free phytosterols (2gm) or phytosterol esters (3.4gm)
  - Phytosterol esters
    - Attached to fatty acids making them disperse more readily in the intestinal tract
    - Only supplements that can claim reduction in the risk of heart disease
- Brands: Naturemade Cholestoff Plus, Puritan’s Pride Phytosterol Complex, Now Foods Beta-sitosterol Plant Sterols
Phytosterols

- Benecol Spreads: 1 tablespoon = 500mg
- Lettuce, Green raw: 507mg
- Capers, Canned: 417mg
- Pickles: 254mg
- Asparagus, raw: 240mg
- Beet Greens, raw: 191mg
- Cucumber with peel raw: 187mg
- Okra, raw: 144mg
### Whole Grain Whole Wheat

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**Ingredients:**
- Unbromated Stone Ground 100% Whole Wheat Flour
- Water
- Crushed Wheat
- High Fructose Corn Syrup
- Partially Hydrogenated Vegetable Shortening (Soybean and Cottonseed Oils)
- Raisin Juice Concentrate
- Wheat Gluten
- Yeast
- Whole Wheat Flakes
- Unsulphured Molasses
- Salt
- Honey
- Vinegar
- Enzyme Modified Soy Lecithin
- Cultured Whey
- Unbleached Wheat Flour
- Soy Lecithin

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### Natural Wheat Bread

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**Ingredients:**
- Unbleached Enriched Wheat Flour
- Malted Barley Flour
- Niacin
- Reduced Iron
- Thiamin Mononitrate (Vitamin B1)
- Riboflavin (Vitamin B2)
- Folic Acid
- Water
- High Fructose Corn Syrup
- Molasses
- Partially Hydrogenated Soybean Oil
- Yeast
- Corn Flour
- Salt
- Ground Caraway
- Wheat Gluten
- Calcium Propionate (Preservative)
- Monoglycerides
- Soy Lecithin
Definitions on Labels

- **Fat-free**: less than 0.5 g of fat per serving
- **Saturated fat-free**: less than 0.5 g of saturated fat per serving, and less than 0.5 g of *trans* fatty acids per serving
- **Cholesterol-free**: less than 2 mg of cholesterol and 2 g or less of saturated fat per serving
- **Sodium-free**: less than 5 mg of sodium per serving
Label Language

• **Reduced fat:** at least 25% less fat per serving

• **Light (in fat):** half the fat of the regular version
What To Do

• Lose weight
• Get active
• Limit saturated fats to less than 7% of total calories
• Limit trans fats
• Increase soluble fiber
• Trial plant stanols and sterols
What To Do

• Use low-fat cooking methods: bake, broil, microwave, roast, steam
• Chill soups and stew to remove congealed fat
• Use low-fat dairy
• Use a variety of herbs and spices in place of salt
• Use trans fat-free margarines
• Choose lean meats, remove fat and skin
What To Do

• Ask for sauces and dressings on the side
• Fill up on vegetables
• Watch toppings on vegetables and salads
• Chinese restaurants: eat steamed dishes, light or no sauces
• Italian: Eat red sauces or primavera
• Mexican: eat lean chicken or beans
• Pizza: eat vegetables, ask for half the cheese
“This simplifies things! Each serving contains 10 grams of ‘stuff that will kill you’ and 15 grams of ‘stuff that won’t kill you’.”
Questions?