CARDIOVASCULAR DISEASE:
Reduction of Risk & Treatment through Diet & Lifestyle Changes

Guest Expert: Janine Dray-Daris, MSH, RDN, LD/N
HHQI Announcements
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  – Accepted in all states
Objectives

After the webinar, the learner will be able to:

• Explain 2 scientific causes of cardiovascular disease (CVD).
• Identify 3 therapeutic lifestyle changes that can reduce the risk for CVD.
• Describe a healthy diet to help reduce CVD.
Our Featured Expert

• Janine Dray-Daris MSH, RDN, LD/N
  – Master’s in Health Science with emphasis on Nutrition and Dietetics (University of North Florida)
  – B.S. Food Science and Human Nutrition, Dietetics (University of Florida – Gainesville)
  – Professor of Medical Nutrition Therapy
  – ISPP Coordinator for Nutrition and Dietetics Department at UNF The Independent Supervised Practice Program
  – Currently enrolled in the Doctorate in Clinical Nutrition (DCN); expected graduation date: 2019 (University of North Florida)
Quarterly CardioLAN Webinar | September 20, 2018 | 2-3pm ET

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One-Third of All Deaths

- Cardiovascular diseases (CVD), including heart diseases and stroke, account for one-third of deaths throughout the world, according to a new scientific study that examined every country over the past 25 years.
Causes of Death in Perspective

Cardiovascular diseases claim more lives each year than all forms of cancer and Chronic Lower Respiratory Disease combined.

Source: Atlas of Risk/NHS
Facts of Cardiovascular Disease

• Cardiovascular disease, listed as the underlying cause of death, accounts for nearly 836,546 deaths in the US. That’s about 1 of every 3 deaths in the US.
• About 2,300 Americans die of cardiovascular disease each day, an average of 1 death every 38 seconds.
• About 92.1 million American adults are living with some form of cardiovascular disease or the after-effects of stroke.
• Direct and indirect costs of total cardiovascular diseases and stroke are estimated to total more than $329.7 billion; that includes both health expenditures and lost productivity.
What causes CVD?

• Age
• Gender
• Genetics/Family History
• Prior CV Event

• High Cholesterol Levels
• Hypertension
• Type 2 Diabetes
• Obesity/Overweight
• Smoking
• Physical Inactivity
• Stress
• Excessive Alcohol Intake
• Unhealthy Diet
Atherosclerosis

- Many of the risk factors for cardiovascular disease cause problems because they lead to atherosclerosis.
- Atherosclerosis is the narrowing and thickening of arteries and develops for years without causing symptoms. It can happen in any part of the body. Around the heart, it is known as coronary artery disease, in the legs it is known as peripheral arterial disease.
Risk Factor: Cholesterol

- Cholesterol is a waxy, fat-like substance used by the body to build cell walls and make several essential hormones. Your liver produces cholesterol and you absorb it from the animal fats you eat.

- Cholesterol is carried through the blood by particles called lipoproteins. There are two types: low-density lipoproteins (LDL) and high-density lipoproteins (HDL). The former carries the cholesterol around the body in the blood and the latter transports cholesterol out of the blood into the liver.

- When cholesterol is too high, or the levels of the two types are out of balance (dyslipidaemia), the cholesterol can clog the arteries affecting the flow of the blood.
Risk Factor: Hypertension

- Optimal blood pressure is defined as a systolic blood pressure less than 120 mmHg. The level of raised blood pressure for which investigation and treatment have been shown to do more good than harm is called “hypertension”.
- Blood moving through your arteries pushes against the arterial walls; this force is measured as blood pressure.
- Raised blood pressure occurs when very small arteries (arterioles) tighten. Your heart has to work harder to pump blood through the smaller space and the pressure inside the vessels grows. The constant excess pressure on the artery walls weakens them making them more susceptible to atherosclerosis.
Risk Factor: Diabetes Type 2

- CV risk factors including obesity, hypertension and dyslipidemia are common in patients with DM, particularly those with T2DM.
- Multiple studies have reported that several factors including increased oxidative stress, increased coagulability, endothelial dysfunction and autonomic neuropathy are often present in patients with DM and may directly contribute to the development of CVD.

2/3 OF DEATHS ARE ATTRIBUTED TO CVD IN PEOPLE WITH DIABETES
Risk Factor: Body Weight

Every Bit Helps

- Moderate weight-loss of even as little as 10% in those affected by excess weight and obesity can IMPROVE or PREVENT obesity-related risk factors for CVD.
Risk Factor: Smoking

- **100% increase in risk**
  - Stroke; coronary heart disease; impotence
- **300% increase in risk**
  - Death from undiagnosed coronary heart disease
- **More than 300% increase in risk**
  - Peripheral arterial disease
- **400% increase in risk**
  - Aortic aneurysm

Risk Factor: Physical Inactivity

• Whatever your age or fitness level, increasing your exercise will lower your risk of CVDs.
Risk Factor: Stress

• High stress levels increase the risk of cardiovascular disease by causing prolonged high blood pressure and a faster heart rate.
Dietary Factors that Affect Blood Lipids

• Saturated Fatty Acids
  – The most hypercholesterolemic fats are palm kernel, coconut and palm oils, lard, and butter
  – SFAs also associated with CVD progression: milk, cheese, butter, lamb, bakery goods, fast foods, snacks
  – Average American intake is 11% of kcals

Sources of Saturated Fats
• Lard
• Fat in beef, pork, lamb
• Milk fat (butter)
• Coconut oil
• Kernel oil
Recommendations for Dietary Patterns

• Low-Fat Diets
  – Diet based on total fat consumption of 25% - 35% TEI, of which SFA should be no more than 7% to 10%, Trans fat less than 1%, unsaturated fats (mainly MUFAs and Omega 3 PUFAs), and less than 300mg/day of cholesterol.
  – A low-fat diet with energy restriction may present a healthy alternative to the typical Western diet.
  – Generally, this diet increases carbohydrate intake. Controversy re the type and amount of carbohydrate consumed.
TLC: Therapeutic Lifestyle Changes

- TLC is the acronym for Therapeutic Lifestyle Changes. Holding second position in the top of most efficient diets in 2015, TLC consists of a punctual nutritional plan, created by specialists from the National Institutes of Health’s National Cholesterol Education Program in the United States. It is proper for both losing weight and keeping healthy, according to the U.S. News & World Report.

- TLC is based on an alimentary regime that aims at reducing the cholesterol intake. It is not a diet, but a long-term nutrition style which enhances the quality of life.
Nutrient Composition of TLC Diet

<table>
<thead>
<tr>
<th>NUTRIENT</th>
<th>RECOMMENDED INTAKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated Fat</td>
<td>Less than 7% of total calories</td>
</tr>
<tr>
<td>Polyunsaturated Fat</td>
<td>Up to 10% of total calories</td>
</tr>
<tr>
<td>Monounsaturated Fat</td>
<td>Up to 20% of total calories</td>
</tr>
<tr>
<td>Total Fat</td>
<td>25-35% of total calories</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>50-60% of total calories</td>
</tr>
<tr>
<td>Fiber</td>
<td>20-30 grams per day</td>
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<tr>
<td>Protein</td>
<td>Approximately 15% of total calories</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less than 200mg per day</td>
</tr>
<tr>
<td>Total Calories (Energy)</td>
<td>Balance energy intake and expenditure to maintain</td>
</tr>
<tr>
<td></td>
<td>desirable body weight and prevent weight gain</td>
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</tbody>
</table>
## TLC Diet

<table>
<thead>
<tr>
<th>FOOD</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breads and cereals</td>
<td>&gt;6 servings per day (adjust to meet energy needs)</td>
</tr>
<tr>
<td>Vegetables and fruits</td>
<td>3-5 servings vegetables per day</td>
</tr>
<tr>
<td></td>
<td>2-4 servings fruits per day</td>
</tr>
<tr>
<td>Dairy products</td>
<td>2-3 servings per day</td>
</tr>
<tr>
<td>Eggs</td>
<td>&lt;2 yolks per week</td>
</tr>
<tr>
<td>Meat, fish, poultry</td>
<td>&lt;5 ounces per day</td>
</tr>
<tr>
<td>Fats and oils</td>
<td>Adjust to caloric level</td>
</tr>
</tbody>
</table>
TLC Diet: Eat MORE of These Foods

- Fresh, frozen, canned vegetables without added fat, sauce, fresh, frozen, canned or dried fruit
- Non-fat, half-percent, and low-fat milk, buttermilk, yogurt, cheese
- Unsaturated oils, soft or liquid margarines and spreads, salad dressings, seeds and nuts
- Lean cuts of meat; extra lean hamburger, fish; meat alternatives made with soy or TVP
- Whole grain breads and cereals, pasta, rice, potatoes, dried beans and peas, low-fat crackers, pretzels, cookies
TLC Diet: Eat LESS of These Foods

- High-fat bakery products (doughnuts, biscuits, croissants, pies, cookies)
- Chips, cheese puffs, snack mix, regular crackers, buttered popcorn
- Whole and reduced-fat milk and dairy products, ice cream, cream, half and half, cream cheese, sour cream and cheese
- Whole eggs, yolks
- Fatty meat such as ribs, T-bone steak, regular hamburger, bacon, sausage, salami, hot dogs, organ meats, liver, brains, sweetbreads, fried meat, poultry and fish
- Butter, shortening, stick margarine, chocolate, tropical oils, coconut, palm and palm kernel
DASH or TLC
DASH or TLC
DASH Diet

• Holding first position in the top of efficient diets in 2015, DASH is the acronym for *Dietary Approaches to Stop Hypertension*; it was conceived by American doctors for people who suffer from hypertension.

• A program assembled in the 1990s with the aim of lowering blood pressure and CVD incidence by nutritional means.

• Recommended diet by the AHA.

• Comprises vegetables, fruits, low-fat dairy, whole grains, chicken, nuts, fish. Low in sugar, saturated fat, meat, sodium.

• PREMIER trial: DASH diet + PA + restricting Sodium and Alcohol resulted in significant reductions in both systolic and diastolic blood pressures in both hypertensive and normotensive individuals (Appel et al., 2003).
DASH Diet

Grains
6-8 SERVINGS PER DAY

Fresh Fruits and Vegetables
4-5 SERVINGS OF EACH PER DAY

Lean Protein
6 OR LESS SERVINGS PER DAY

Low-fat Dairy
2-3 SERVINGS PER DAY

Legumes or Nuts/Seeds
4-5 SERVINGS PER WEEK

Fats & Sweets
LIMITED
Mediterranean Diet

• Characterized by a relatively high fat intake (40-50% of TEI), of which MUFAs 15-25% and SFA ≤8%
• Based on intake of fresh fruit, vegetables, whole grains, legumes, nuts and olive oil
• Adherence associated with decreased risk of cardiovascular events
• Preferable to LFD in reducing triglyceride levels, increasing HDL-C and improving insulin sensitivity
Recommendations for Specific Food Items

- Whole Grains & Dietary Fiber
- Vegetables & Fruit
- Nuts
- Milk & Dairy Products
- Alcohol

- Coffee
- Tea
- Chocolate
- Omega 3 Fatty Acids
- Eggs
- Stanols/Sterols
Whole Grains & Dietary Fiber

• Whole Grains and Dietary Fiber can be divided into insoluble and soluble fiber.
• In a review of 10 studies of 4-8 weeks duration that included 56-85g of fiber in individuals with CHD or CHD risk, eating fiber lowered total cholesterol by 7.7 mg/dL, and LDL-C by 6.9 mg/dL (Kelly et al., 2007).
• In a meta-analysis of 67 controlled trials, daily consumption of 2-10g of soluble fiber lowered LDL-C by 2.2 mg/dL with no significant changes in HDL-C or triglycerides (Brown et al., 1999).
• Two possible mechanisms for lipid lowering effects:
  – Increase in bile acid fecal excretion
  – Decreased lipid absorption
• Current guidelines recommend a daily dietary fiber intake of 25g for adult women and 38g for adult men (AHA, 2006; American Dietetic Association, 2002; NCEP, 2001).
Vegetables & Fruits

- In a meta-analysis of 9 studies, **CHD risk was lower by 7%** for each additional fruit serving a day. Association between veg intake and CHD risk was mixed (Dauchet et al., 2006).
- Several studies report **lower blood pressure** with vegetable and fruit consumption.
- AHA recommends intake of at least 8 servings of fruits and vegetables per day (AHA, 2006).
- Mechanism: High dietary fiber; High anti-oxidant content
- Low-calorie, low-sodium, and satiating food
Nuts

- Nutrient-dense foods, rich in MUFAs, protein, fibre, minerals, phytosterols and phenolic compounds
- Data shows a consistent positive association between nut intake and CHD risk, with a dose-response pattern (Sabate & Ang, 2009).
- High nut intake associated with 35% risk reduction for CVD (Kris-Etherton et al., 2008)
- Data from 25 trials conducted in individuals with normolipidemia and hypercholesterolemia who were not taking lipid-lowering medications showed that with a consumption of 67g/day of nuts, LDL-C concentration was reduced by a mean of 10.2 mg/dL with no significant change in HDL-C levels. Mean TG levels were reduced by 20.6 mg/dL in subjects with blood triglyceride levels ≥150 mg/dL.
- Possible mechanism:
  - High PUFA and low SFA content
  - Phytochemicals and other micronutrients may have a beneficial effect on blood lipids as well as CHD risk factors such as oxidation and inflammation.
- Recommended to consume 20-30g of unsalted nuts per day
Milk & Dairy Products

• Conflicting evidence; evidence on individual dairy products is very small.

• **Reduced risk** in subjects with individuals with highest dairy consumption vs. those with lowest intake for all-cause deaths, IHD and stroke (Elwood et al., 2010).

• Modest inverse association between milk intake (200ml/day) and CVD risk. Milk intake not associated with risk of CHD, stroke or mortality (Soedamah-Muthu et al., 2011).

• Evidence that fermented milk products (esp. by *Lactobacillus helveticus*) can **lower blood pressure** in hypertensive individuals due to bioactive peptides

• Recommendations:
  – Include 2-3 portions low-fat, low-sugar dairy products/day
  – No evidence that Ca and/or Vit D supplements prevent CVD
Alcohol

• Moderate alcohol intake (1-2 drinks/day) is associated with reduced risk of CHD in healthy individuals.

• Mechanism: ↑ in HDL-C, ↓ plasma viscosity and fibrinogen concentration, ↓ platelet aggregation, ↓ inflammation, ↑ antioxidant effect; among CVD patients, binge drinking had double the total CV mortality risk than regular drinking.

• Excessive consumption associated with higher risk for hypertension, excess weight and cancer

• Individuals with liver disease, fatty liver, hypertriglyceridemia, hypertension should avoid alcohol consumption.
Coffee

- 80-90% of adults report regular consumption of coffee.
- Besides caffeine, coffee also contains flavonoids, melanoidins, and various lipid-soluble compounds. Most of these compounds are efficiently absorbed and have anti-oxidant properties.
- Little evidence of health risks; caution in vulnerable people
- Modest evidence for protection against CAD; risk for developing T2DM lower in individuals who consumed >4 cups/day vs. <2 cups/day
- In order not to increase CVD morbidity/side-effects, recommended intake is up to 400mg/day in healthy adults.
Tea

- Beneficial effects of tea attributed to its polyphenolic flavonoids, known as catechins. This accounts for 40% the dry weight of green tea.
- A meta-analysis of 18 studies found no significant association with risk for developing CAD for black tea. For green tea, an ↑ 1 cup/day was associated with 10% decreased risk of CAD incidence (Wang et al., 2011).
- In another meta-analysis of 9 studies, individuals consuming >3 cups/day had a 21% lower risk of ischaemic stroke than those consuming <1 cup/day (Arab et al., 2009).
- In a meta-analysis of 133 trials, black tea increased blood pressure, but chronic consumption did not. Green tea did not effect BP, but reduced LDL-C levels (-9 mg/dL) (Deke et al., 2011).
- Mechanism: Anti-inflammatory, anti-oxidant effects; favorable effects on endothelial function
Chocolate

- Cocoa is rich in polyphenols.
- Difference between cocoa and chocolate; the latter contains high amounts of fat and sugar, with implications for dental health and diabetes.
- Chocolate consumption is associated with lower risk for CVD and a 29% reduced risk for stroke (Buitrago-Lopez et al., 2011).
  - However, it is not recommended to consume chocolate for CVD prevention.
- Dark chocolate with a high cocoa % has abundant anti-oxidants and is preferable over milk chocolate.
Garlic

- Attributed with favorable CV effects due to thiosulfinates, including allicin – the active component
- In a meta-analysis of 29 trials, garlic was found to significantly reduce total cholesterol, but no effect on HDL-C (Reinhart et al., 2009).
- Also, modest but significant ↓ in platelet aggregation with garlic, compared to placebo (Ackermann et al., 2001).
- Recommendation: Eating 2 garlic cloves/day (4g) may reduce blood cholesterol levels.
- Because alliinase is deactivated by heat, cooked garlic is less powerful medicinally.
Omega-3

- Consumption of fish and fish oils rich in EPA, DHA will lower cholesterol, LDL, and TG and reduce sudden cardiac death.
- One fatty fish meal/week resulted in 50% decrease in risk of cardiac arrest.
- 1 g supplement of omega-3 daily reduced risk of CVD, nonfatal MI, and nonfatal stroke.
Eggs

- Research suggests that, in contrast to SFA and TFA, dietary cholesterol in general and cholesterol in eggs in particular, have limited effects on blood cholesterol levels and on CVD (Jones, 2009).
- About 50% of the fat in eggs is MUFAs.
- Source of high BV protein, vitamins, and minerals (folic acid, Vit B12, Vits E and D, selenium and choline).
- Most large studies found no association between egg consumption and CVD.
  - However, data from 20k men over 20 years in the Physician’s Health Study showed that >7 eggs/week was associated with increased risk of heart failure.
- Recommendation:
  - Consumption of 5 eggs/wk does not significantly increase CVD risk in healthy people.
  - In individuals with T2DM, CHD, and/or hypercholesterolemia that is uncontrolled, limit egg consumption to 3-4 per week.
Stanols/Sterols

• Isolated from soybean oils or pine tree oil
• Lowers blood cholesterol
• Esterified and made into margarines
• Consuming 2-3 grams/day lowers cholesterol by 9-20% in persons with hypercholesterolemia
• Inhibits absorption of dietary cholesterol
General Dietary Recommendations

• Based on current guidelines by:
  – National Institute for Health and Care Excellence (NICE)
  – European Society of Cardiology (ESC)
  – American Heart Association (AHA)
  – American College of Cardiologists (ACC)
General Dietary Recommendations

- Energy balance
- Reduce saturated fat intake; increase MUFAs and PUFAs
- Increase fiber
- Increase intake of fruit and vegetables
- Increase fish intake
- Limit alcohol consumption
- Reduce salt
- Reduce sugars
- Reduce trans fats
- Meal frequency
References


References


Thank You! Questions?
Resources

- HHQI Resource Library
  - Cardiovascular Health Part 1
  - BPIP
  - Fundamental Focus: BP Control & Smoking Cessation BPIP
  - Following the DASH Eating Plan (also in Spanish)
  - At A Glance: Lowering Your BP with DASH
  - In Brief: Lowering Your BP with DASH
Resources (cont.)

• HHQI Resource Library (cont.)
  – 6 Tips to Cut Sodium (also in Spanish)
  – Types of Fats
  – Where’s the Sodium (also in Spanish)

• Lifestyle Management for Cardiovascular Health
  (HHQI University course with 1.0 nursing CEs)
  – Includes 2 videos
Continuing Education

  – In step #3, you’ll select the Cardiovascular Health course catalog

• Forgot your username? Email us at HHQI@qualityinsights.org
Questions?
Thank You!

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