Controlling Cholesterol and Diet Modifications

Reducing your Risk of Heart Disease
Webinar Series

Created with an educational grant from:
About Mended Hearts

• Mended Hearts mission is:
  “To inspire hope and improve the quality of life of heart patients and their families through on-going peer-to-peer support, education, and advocacy”.

• 285 Chapters across the country serving over 460 hospitals.
The American Society for Preventative Cardiology mission statement is:

“To promote the prevention of cardiovascular disease, advocate for the preservation of cardiovascular health, and disseminate high-quality, evidence-based information through the education of healthcare clinicians and their patients”.
Presenters

• Moderator: Andrea Baer, MS, Director of Patient Advocacy and Program Management for Mended Hearts

• Dr. Amit Khera, Professor of Medicine at the University of Texas, Southwestern Medical School in Dallas, Texas. President of the American Society for Preventative Cardiology (ASPC)

• Ron Manriquez, Western Regional Director and President Elect, Mended Hearts

• Angela Manriquez, Western Assistant Regional Director, Mended Hearts
Cholesterol Control and Diet Modifications

Amit Khera, MD, MSc, FACC, FAHA, FASPC
President, American Society for Preventive Cardiology
Professor of Medicine
Director, Preventive Cardiology Program
Program Director, Cardiology Fellowship
UT Southwestern Medical Center
Cholesterol Has a Central Role in Atherosclerosis

Diagram showing a blood vessel with labels for Macrophages, Lipid Core, Smooth Muscle Cells, and the Lum en.
## NCEP-ATPIII Cholesterol Classification

<table>
<thead>
<tr>
<th></th>
<th>LDL Cholesterol – Primary Target of Therapy</th>
<th>Total Cholesterol</th>
<th>HDL Cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100 (70)</td>
<td>Optimal</td>
<td>&lt;200</td>
<td>&lt;40</td>
</tr>
<tr>
<td>100-129</td>
<td>Near optimal/above optimal</td>
<td>200-239</td>
<td>&gt;40</td>
</tr>
<tr>
<td>130-159</td>
<td>Borderline high</td>
<td>≥240</td>
<td>≥60</td>
</tr>
<tr>
<td>160-189</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥190</td>
<td>Very high</td>
<td></td>
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</table>
What is a Healthy Diet?
Goals for Diet Interventions

- Weight Loss
- Cancer Prevention
- Bone Health
- Diabetes Prevention
- Heart Disease Prevention
- Digestive Ease
- Joint Health
- Cognitive Health
Lifestyle Changes and Improvement in Lipid Parameters

↓ Saturated fat
↓ Cholesterol
↑ Soluble fiber
↑ Plant Sterols

↓ Weight
↓ Carbohydrates
↑ Exercise
(Smoking Cessation)

↓ LDL-C

↓ TG
↑ HDL-C
Dietary Fats

**Saturated Fat**

![Saturated Fat Structure](image)

Saturated fats are found in products such as butter, whole milk, cream, and cheese, and oils such as palm, and coconut oil.

**Unsaturated Fat**

![Unsaturated Fat Structure](image)
Saturated Fat and Blood Cholesterol

N=22

Polysaturated fat: Safflower oil
Saturated fat: Palm oil or lard

Average Δ 42mg/dL

Grundy SM and Vega G. AJCN 1988;47:822-4
Diet Whack-A-Mole

Saturated Fat

Simple Carbs
Saturated Fat and Heart Disease: How You Replace is Key

84,628 Subjects- Nurses Health Study and Health Professionals Follow-up Study

Diet assessed every 4 years
24-30 years follow up

Evolving Dietary Recommendations: From Macronutrients to Patterns

Saturated Fat
Mediterranean Diet vs. Traditional Western Diet

The USDA Pyramid
- Fruits: 2-4 servings daily
- Vegetables: 3-5 servings daily
- Breads, cereal, rice, pasta: 6-11 servings daily

Sparingly
- Fats, oils, sweets
- Meat, poultry, fish, dry beans, eggs, nuts

The Mediterranean Pyramid
- Olive oil: Daily
- Cheese, yogurt: A few times a week
- Fish: A few times a month
- Poultry
- Sweets
- Eggs
- Red meat

Beans, other legumes, nuts
Breads, pasta, rice, couscous, polenta, bulgar, potatoes, other grains
Mediterranean Diet and Primary Prevention of CVD: PREDIMED

7447 subjects at high risk for CVD

Acute MI, Stroke, Death from CVD

Med diet, EVOO: hazard ratio, 0.70 (95% CI, 0.53–0.91); P=0.009
Med diet, nuts: hazard ratio, 0.70 (95% CI, 0.53–0.94); P=0.02

↓ Risk 30%

EVOO: 1 L per week
Nuts: 30g/week walnuts, hazelnuts, almonds

Estruch R et al. NEJM 2013;368: 1279-1290
2018
AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA

Guideline on the Management of Blood Cholesterol:
Executive Summary

Chair, Scott Grundy MD, PhD
Top 10 Take Home Messages

1. **In all individuals, emphasize a heart-healthy lifestyle across the life course.**

   A healthy lifestyle reduces atherosclerotic cardiovascular disease (ASCVD) risk at all ages. In younger individuals, healthy lifestyle can reduce development of risk factors and is the foundation of ASCVD risk reduction.

   In young adults 20 to 39 years of age, an assessment of lifetime risk facilitates the clinician–patient risk discussion (see No. 6) and emphasizes intensive lifestyle efforts. In all age groups, lifestyle therapy is the primary intervention for metabolic syndrome.
2. In patients with clinical ASCVD, reduce low-density lipoprotein cholesterol (LDL-C) with **high-intensity statin therapy** or maximally tolerated statin therapy.

The more LDL-C is reduced on statin therapy, the greater will be subsequent risk reduction.

Use a maximally tolerated statin to lower LDL-C levels by ≥50%.
## CTT Collaboration (>170,000 subjects)

### Statin Use and CVD Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Statin/More statin</th>
<th>Control/Less statin</th>
<th>Relative risk (CI) per ~40mg/dL lower LDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonfatal MI</td>
<td>3485 (1.0)</td>
<td>4593 (1.3)</td>
<td>0.73 (0.69 - 0.78)</td>
</tr>
<tr>
<td>CHD death</td>
<td>1887 (0.5)</td>
<td>2281 (0.6)</td>
<td>0.80 (0.74 - 0.87)</td>
</tr>
<tr>
<td>Any major coronary event</td>
<td>5105 (1.4)</td>
<td>6512 (1.9)</td>
<td>0.76 (0.73 - 0.78)</td>
</tr>
<tr>
<td>CABG</td>
<td>1453 (0.4)</td>
<td>1857 (0.5)</td>
<td>0.75 (0.69 - 0.82)</td>
</tr>
<tr>
<td>PTCA</td>
<td>1767 (0.5)</td>
<td>2283 (0.7)</td>
<td>0.72 (0.65 - 0.80)</td>
</tr>
<tr>
<td>Unspecified</td>
<td>2133 (0.6)</td>
<td>2667 (0.8)</td>
<td>0.76 (0.70 - 0.82)</td>
</tr>
<tr>
<td>Any coronary revascularization</td>
<td>5353 (1.5)</td>
<td>6807 (2.0)</td>
<td>0.75 (0.72 - 0.78)</td>
</tr>
<tr>
<td>Ischemic stroke</td>
<td>1427 (0.4)</td>
<td>1751 (0.5)</td>
<td>0.79 (0.72 - 0.87)</td>
</tr>
<tr>
<td>Hemorrhagic stroke</td>
<td>257 (0.1)</td>
<td>220 (0.1)</td>
<td>1.12 (0.88 - 1.43)</td>
</tr>
<tr>
<td>Unknown stroke</td>
<td>618 (0.2)</td>
<td>709 (0.2)</td>
<td>0.88 (0.76 - 1.01)</td>
</tr>
<tr>
<td>Any stroke</td>
<td>2302 (0.6)</td>
<td>2680 (0.8)</td>
<td>0.84 (0.79 - 0.89)</td>
</tr>
<tr>
<td>Any major vascular event</td>
<td>10,973 (3.2)</td>
<td>13,350 (4.0)</td>
<td>0.78 (0.76 - 0.80)</td>
</tr>
</tbody>
</table>

CHD, coronary heart disease; CABG, coronary artery bypass graft; MI, myocardial infarction; PTCA, percutaneous transluminal coronary angioplasty

## Statin Intensity

<table>
<thead>
<tr>
<th>High-Intensity Statin Therapy</th>
<th>Moderate-Intensity Statin Therapy</th>
<th>Low-Intensity Statin Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin (40†)-80 mg</td>
<td>Atorvastatin 10 (20) mg</td>
<td>Simvastatin 10 mg</td>
</tr>
<tr>
<td>Rosuvastatin 20 (40) mg</td>
<td>Rosuvastatin (5) 10 mg</td>
<td>Pravastatin 10–20 mg</td>
</tr>
<tr>
<td></td>
<td>Simvastatin 20–40 mg</td>
<td>Lovastatin 20 mg</td>
</tr>
<tr>
<td></td>
<td>Pravastatin 40 (80) mg</td>
<td>Fluvastatin 20–40 mg</td>
</tr>
<tr>
<td></td>
<td>Lovastatin 40 mg</td>
<td>Pitavastatin 1 mg</td>
</tr>
<tr>
<td></td>
<td>Fluvastatin XL 80 mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluvastatin 40 mg bid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pitavastatin 2–4 mg</td>
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</table>

†Evidence from 1 RCT only: down-titration if unable to tolerate atorvastatin 80 mg in IDEAL

*Italics*- FDA approved but not tested in RCT
TNT: High-dose vs Low-dose Atorvastatin and Major CV Events

10,001 patients with Stable Coronary Disease

HR = 0.78 (95% CI 0.69, 0.89)
\( P < 0.001 \)

Relative Risk Reduction = 22%

Mean LDL-C level = 101 mg/dL

Mean LDL-C level = 77 mg/dL

*CHD death, nonfatal non-procedure-related MI, resuscitated cardiac arrest, fatal or nonfatal stroke.

Ezetimibe: Cholesterol Absorption Inhibitor

Intestines

Dietary Cholesterol

Ezetimibe

Duodenal/jejunal enterocytes

LDL-C

-15-20%

Once a day pill
PCSK9 Inhibitors

- **no PCSK9 binding to the LDL receptor:**
  - LDL receptor is recycled
  - more LDL can be removed from blood

- **PCSK9 binding to the LDL receptor:**
  - LDL receptor is degraded
  - less LDL can be removed from blood
PCSK9 Inhibitors

LDL-C
-50-60%

Evolocumab
Q2wks

Alirocumab
Q2wks

no PCSK9 binding to the LDL receptor:
- LDL receptor is recycled
- more LDL can be removed from blood

PCSK9 binding to the LDL receptor:
- LDL receptor is degraded
- less LDL can be removed from blood

PCSK9 inhibitor blocks PCSK9 binding

75 mg/1 mL pen

150 mg/1 mL pen
LDL Cholesterol

Placebo
(n = 13,784)
(median 92mg/dL)

59% mean reduction (95%CI 58-60), P<0.00001
Absolute reduction: 56 mg/dl (95%CI 55-57)

Evolocumab
(median 30 mg/dl, IQR 19-46 mg/dl)
(n = 13,780)
Very high risk: Hx of multiple ASCVD events, or 1 ASCVD events and multiple high risk conditions (≥65yrs, FH, prior CABG/PCI, DM, HTN, CKD, current smoking, LDL≥100, CHF)
Controlling your cholesterol through diet: The patient and caregiver perspective
Eating heart-healthy foods

- A few changes in your diet can reduce cholesterol and improve your heart health
- Reduce saturated fats. Saturated fats, found primarily in red meat and full-fat dairy products, raise your total cholesterol.
- Eliminate trans fats. Trans fats, sometimes listed on food labels as "partially hydrogenated vegetable oil," are often used in margarines and store-bought cookies, crackers and cakes. Trans fats raise overall cholesterol levels.
Eating heart-healthy foods

• Eat foods with omega-3 fatty acids including things like salmon, mackerel, herring, walnuts and flaxseeds.

• Increase soluble fiber. Soluble fiber is found in such foods as oatmeal, kidney beans, Brussels sprouts, apples and pears.

• Add whey protein. Whey protein, which is found in dairy products, may account for many of the health benefits attributed to dairy. Studies have shown that whey protein given as a supplement lowers both LDL cholesterol and total cholesterol as well as blood pressure.
Tips from a patient

I have a family history of heart disease and stroke.

During my working career fast foods and vending machines were the norm.

Manage your daily intake of high calorie saturated fats and reduce your calorie intake.

Develop a meal plan which adds fruits and vegetables to your diet.

Add fish to your diet which contains omega 3’s.

Exercise daily. Cardio and light weights.

Check your blood pressure and cholesterol levels often.

Check your AIC for diabetes.

Have regular visits to your PCP and cardiologist.

Take your medication as prescribed by your Doctor.
Tips from a Caregiver

Be a caregiver for each other.

Be positive and communicate in a loving and caring way.

Be supportive of healthy heart lifestyle changes.

Be organized to reduce stress and frustration.

Don’t worry, be happy, and have fun!
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