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# A Women's Guide to Cardiovascular Health

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2/27/2025

# Disclosures

No financial disclosures or conflicts of interest

# Goals

- Understand the significance of CHD in women
- Know the risk factors for development of CHD
- Familiarity with Primary Prevention Strategies
- Signs and Symptoms
- Screening and Testing

# Definitions

## CARDIOVASCULAR DISEASE (CVD)

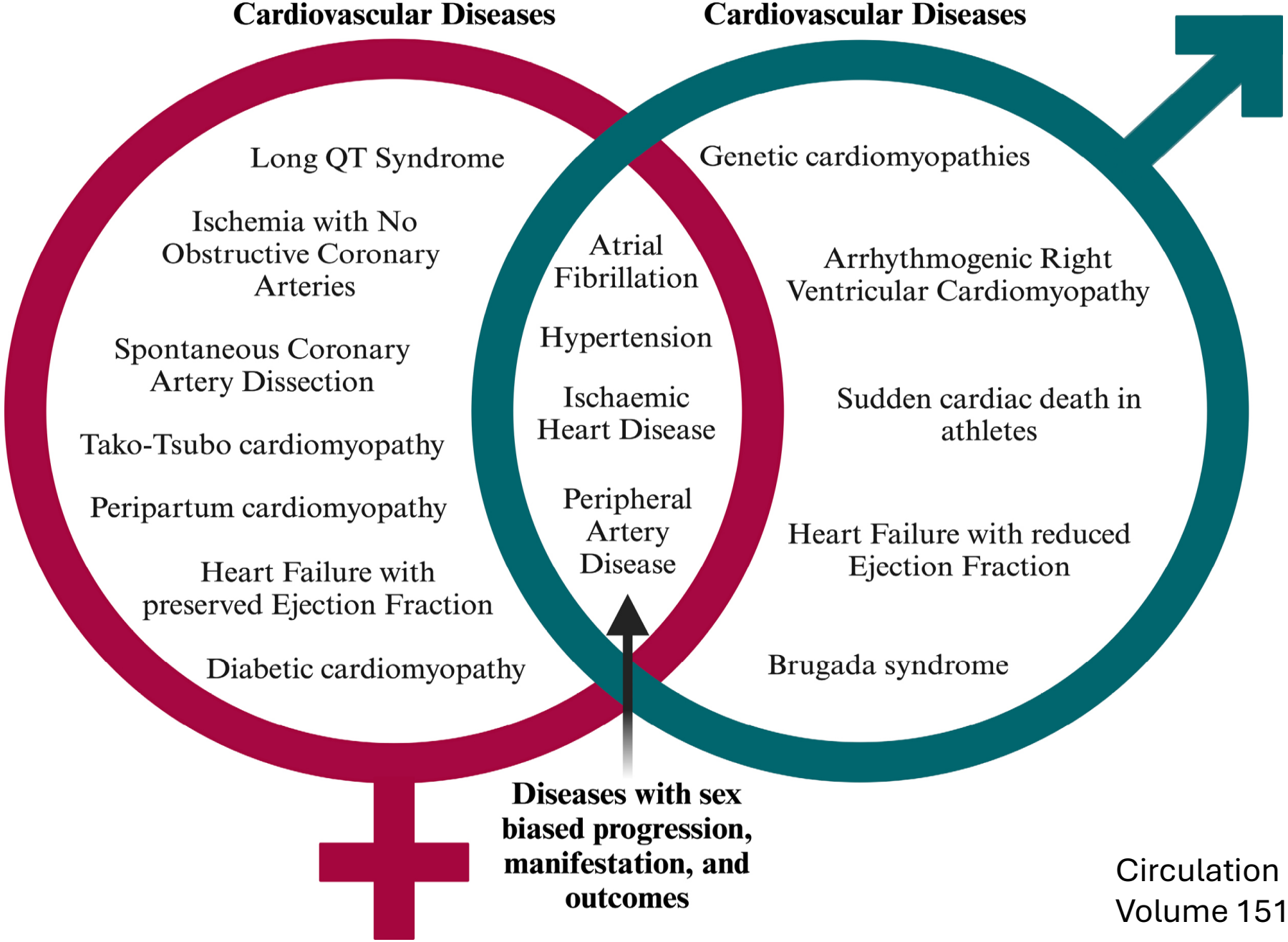
General term for heart and blood vessel issues

## CORONARY HEART DISEASE (CHD)

Narrowed arteries reducing blood flow

## MYOCARDIAL INFARCTION (MI)

Heart attack




Circulation
Volume 151, Number 7

# Heart Disease is the # 1 Killer of Women

- 310,661 deaths in 2021
- 1 in 5 female deaths
- 60 million women (44%) living with some form of heart disease

# Disparities in healthcare

01

Institutional bias- Healthcare professionals

02

Research bias- Exclusion from studies

03

Public bias- societal pressures/beliefs

# Disparities in care

- Women with heart attacks are less like to receive guideline directed medical therapy
- Less likely to receive urgent invasive intervention
- Time from symptoms onset to presentation historically longer in women

*Heart. 2007;93:1369–1375*
*Circulation. 2008;118:2803–2810*

# Disparity in Outcomes

- Over last 40 years women *had* a higher mortality rate after MI than men
- Longer hospital length of stay
- Higher bleeding rates
- Higher 30-day readmission rates
- Higher rate of heart failure following MI

*Circulation. 2012;126:2190–2199*
*Am Heart J. 2012;163:66–73*
*Circulation. 2013;127:641–649*

This Issue Views 6,588 | Citations 1 | Altmetric 37

Medical News in Brief

May 17, 2024

# Patients Treated by Female Physicians Had Better Mortality Rates

Emily Harris

*JAMA*. 2024;331(22):1884. doi:10.1001/jama.2024.8429

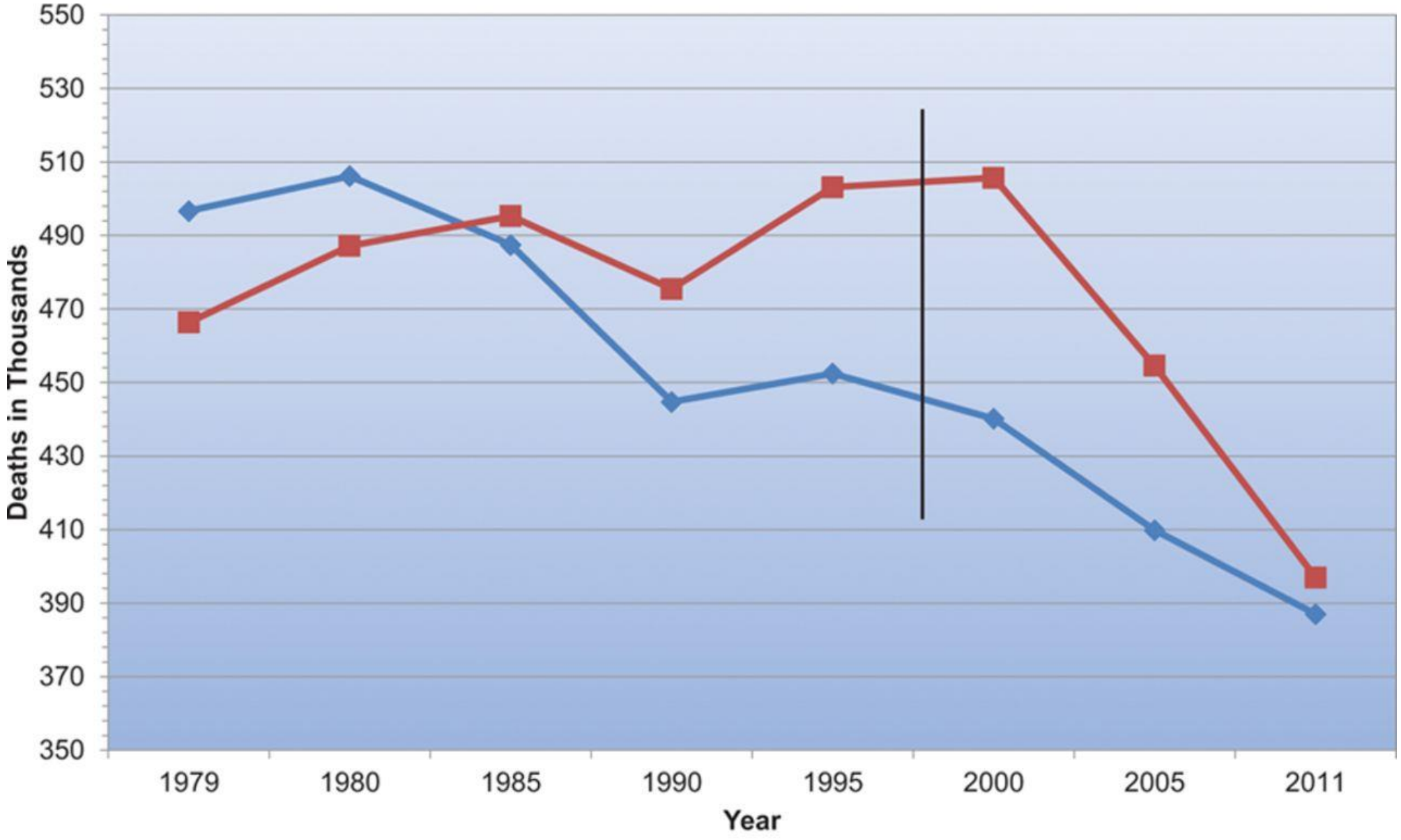
# Historical perspective

- Women chronically underrepresented in clinical trials for heart disease
- 1986 NIH enacted Inclusion of Woman and Minorities in Clinical Research Policy
- 1990 NIH **required** Inclusion of Women in Clinical Research
- 2016 NIH required Sex as a biologic variable in all vertebrate science

# Go Red For Women

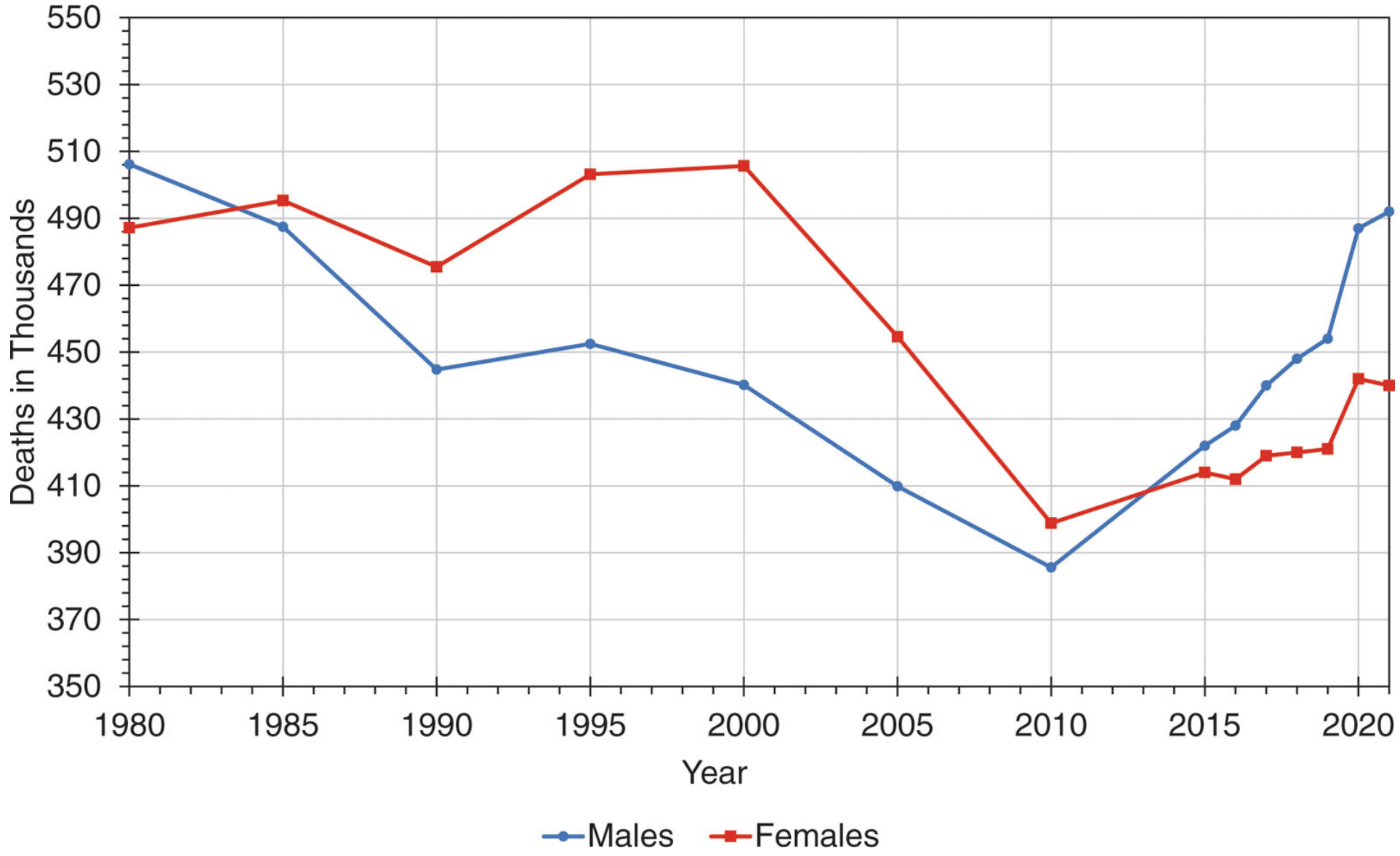
- 2003 NHLBI and AHA recognized disparities in awareness of women's cardiovascular health
- 2004 Launched campaign for public awareness
- Over last 20 years improvement in awareness, increased screening

# Cardiovascular Deaths




Circulation Volume 133, Number 9

# Cardiovascular Deaths




*Circulation Volume 149, Issue 8 Feb 2024*

# Coronary Heart Disease Risk Factors

**Traditional**

- Hypertension
- High cholesterol
- Smoking
- Diabetes
- Family History

**Female specific**

- Preterm delivery
- Hypertensive pregnancy disorders
- Gestational Diabetes
- Radiation therapy for breast cancer
- Auto-immune disorders (RA/SLE)


- eat better
- be more active
- stop smoking
- get adequate sleep
- manage weight
- manage cholesterol
- manage blood pressure
- manage diabetes

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

# Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts

R. Estruch, E. Ros, J. Salas-Salvadó, M.-I. Covas, D. Corella, F. Arós, E. Gómez-Gracia, V. Ruiz-Gutiérrez, M. Fiol, J. Lapetra, R.M. Lamuela-Raventos, L. Serra-Majem, X. Pintó, J. Basora, M.A. Muñoz, J.V. Sorlí, J.A. Martínez, M. Fitó, A. Gea, M.A. Hernán, and M.A. Martínez-González, for the PREDIMED Study Investigators*

# Primary Prevention: Diet

# Primary Prevention: Diet

**Place limitations on:**

- **Sodium:** Less than 2,300 mg a day
- **Added sugar:** No more than 100 calories a day for women and children and 150 calories daily for men.
- **Processed meats:** Such as deli slices, bacon, ham, salami, sausages, hot dogs and jerky.
- **Saturated fat:** Should comprise no more than Less than 5% to 6% of total calories
- **Limited or preferably no alcohol intake**
- **Avoid the use of tobacco products**

❌ Reduce:

- salt
- sugar
- processed meats
- saturated fats
- alcohol
- tobacco products

# Primary Prevention: Exercise

**Benefits of exercise:**

- Reduces your risk of developing heart disease by 25%
- Aides in lowering your blood pressure, cholesterol and risk for certain cancers
- Reduces your risk of stroke
- Helps with weight control
- Reduces anxiety and improves sleep
- Improves blood circulation
- Prevents bone loss
- Increases energy levels

# Primary Prevention: Exercise

- American Heart Association recommends 150 minutes or more a week of moderate intensity exercise or 75 minutes of aerobic exercise
- Consider combining moderate intensity exercise with aerobic exercise

**Exercise Matters**

✅ 150 minutes/week of **moderate exercise**

✅ Benefits: Lowers BP, cholesterol, stroke risk

# Primary Prevention: Cholesterol

HDL- Also known as the “good” cholesterol has protective qualities. This aides in shuttling the bad cholesterol of the arteries and protects against plaque formation.

Estrogen tends to raise HDL and therefore woman tend to have a higher HDL when compared to men.

HDL can be improved/increased with weight loss, routine exercise and a heart healthy diet

# Primary Prevention: Cholesterol

LDL – This is known as the “bad” cholesterol

- Based on clinical trial evidence lowering LDL-C reduces risk of CVD
- lifestyle modifications including routine exercise, heart healthy diet and healthy weight control is recommended

# Primary Prevention: Cholesterol

- When do we initiate cholesterol lowering therapies?
- **LDL-C greater than or equal to 190 mg/dL**
  - Workup and management for familial hyperlipidemia and are started on high intensity statin based on their elevated LDL alone
- **LDL-C less than 190 mg/dL**
  - Indication for statins is guided by their 10 year CVD risk

## When to Treat?

✔ **LDL ≥190 mg/dL →**

Statins recommended

✔ **LDL 160-189 mg/dL →**

Assess family history & metabolic risk

**HDL (Good) vs. LDL (Bad) Cholesterol**

# Primary Prevention: Cholesterol

**Current Age** ℹ *

*Age must be between 20-79*

**Sex** *

Male | Female

**Race** *

White | African American | Other

**Systolic Blood Pressure** (mm Hg) *

*Value must be between 90-200*

**Diastolic Blood Pressure** (mm Hg) *

*Value must be between 60-130*

**Total Cholesterol** (mg/dL) *

*Value must be between 130 - 320*

**HDL Cholesterol** (mg/dL) *

*Value must be between 20 - 100*

**LDL Cholesterol** (mg/dL) ℹ ○

*Value must be between 30-300*

**History of Diabetes?** *

Yes | No

**Smoker?** ℹ *

Current ℹ | Former ℹ | Never ℹ

**On Hypertension Treatment?** *

Yes | No

**On a Statin?** ℹ ○

Yes | No

**On Aspirin Therapy?** ℹ ○

Yes | No

# Primary Prevention: Cholesterol

## Consider risk enhancing factors and include shared decision making

- **Risk enhancing factors to consider:**
  - Family history of premature ASCVD (males, age <55 years; females, age <65 years)
  - Elevated LDL of 160- 189 mg/dL
  - Evidence of metabolic syndrome such as increased waist circumference, elevated glucose or elevated triglycerides
  - CKD
  - inflammatory conditions, such as psoriasis, RA, lupus, or HIV/AIDS
  - History of premature menopause (before age 40 years)
  - Prior history of pregnancy-associated conditions that increase ASCVD risk- preeclampsia, eclampsia or gestational diabetes
  - High-risk race/ethnicity such as south Asian ancestry
  - Abnormal biomarkers such as  Elevated Lp(a), apoB or HS-CRP

Original Contribution

May 27, 1998

# Primary Prevention of Acute Coronary Events With Lovastatin in Men and Women With Average Cholesterol Levels

## Results of AFCAPS/TexCAPS

John R. Downs, MD; Michael Clearfield, DO; Stephen Weis, DO; et al

» Author Affiliations

*JAMA*. 1998;279(20):1615-1622. doi:10.1001/jama.279.20.1615

The NEW ENGLAND JOURNAL of MEDICINE

SPECIALTIES TOPICS MULTIMEDIA CURRENT ISSUE LEARNING/CME AUTHOR CENTER PUBLICATIONS

ORIGINAL ARTICLE

# Rosuvastatin to Prevent Vascular Events in Men and Women with Elevated C-Reactive Protein

**Authors**: Paul M Ridker, M.D., Eleanor Danielson, M.I.A., Francisco A.H. Fonseca, M.D., Jacques Genest, M.D., Antonio M. Gotto, Jr., M.D., John J.P. Kastelein, M.D., Wolfgang Koenig, M.D., +7, for the JUPITER Study Group* Author Info & Affiliations

**Published November 20, 2008** | **N Engl J Med 2008;359:2195-2207** | **DOI: 10.1056/NEJMoa0807646**

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The NEW ENGLAND JOURNAL of MEDICINE

SPECIALTIES TOPICS MULTIMEDIA CURRENT ISSUE LEARNING/CME AUTHOR CENTER PUBLICATIONS

ORIGINAL ARTICLE

# Prevention of Coronary Heart Disease with Pravastatin in Men with Hypercholesterolemia

**Authors**: James Shepherd, M.D., Stuart M. Cobbe, M.D., Ian Ford, Ph.D., Christopher G. Isles, M.D., A. Ross Lorimer, M.D., Peter W. Macfarlane, Ph.D., James H. McKillop, M.D., and Christopher J. Packard, D.Sc., for the West of Scotland Coronary Prevention Study Group* Author Info & Affiliations

**Published November 16, 1995** | **N Engl J Med 1995;333:1301-1308** | **DOI: 10.1056/NEJM199511163332001**

VOL. 333 NO. 20 | Copyright © 1995

# Statins in primary prevention

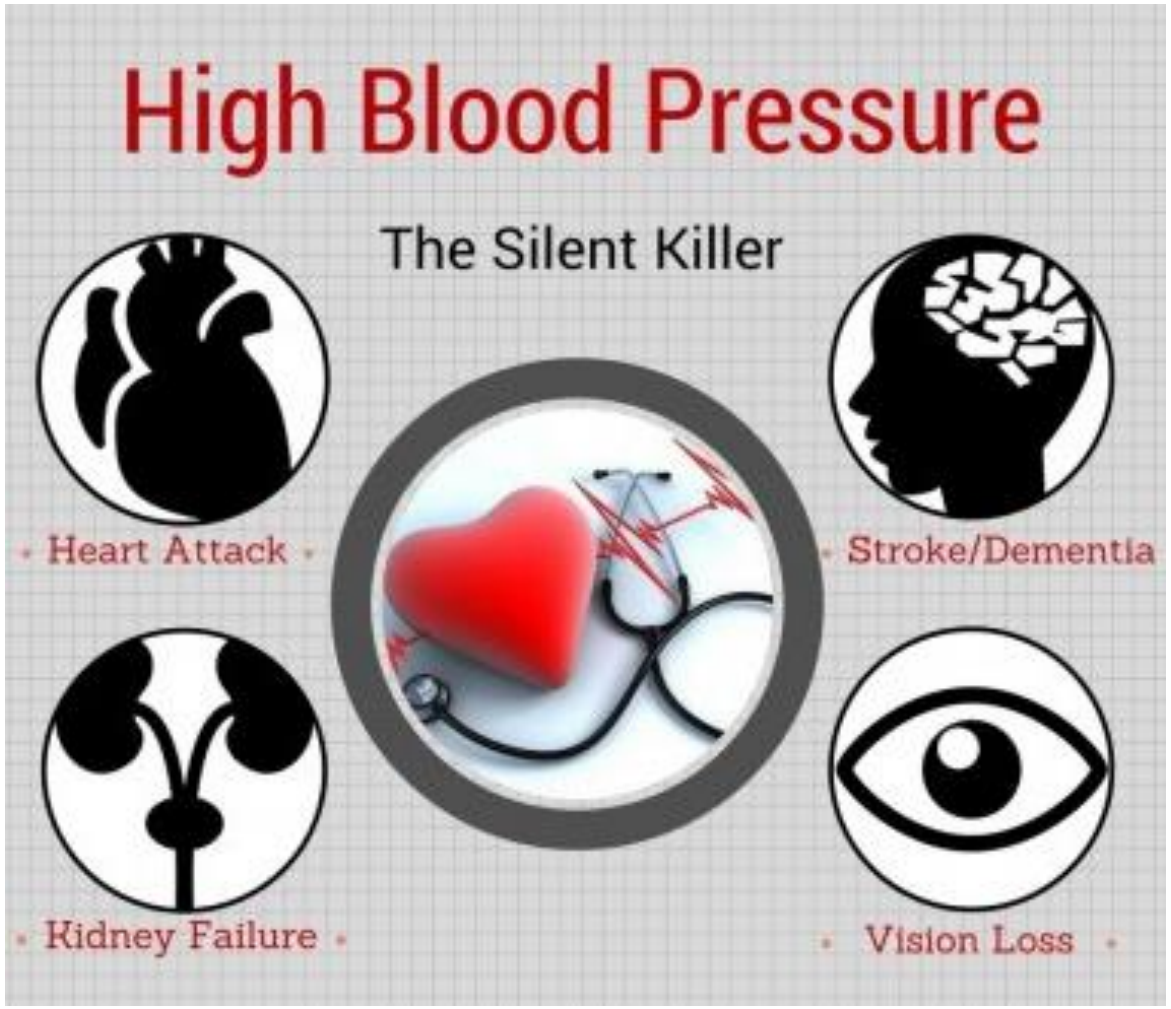
- Decades of research showing reduced heart attack and stroke risk
- Estimates suggest only about half of US adults who may benefit are taking them
- Major side effects are rare
- Muscle aches are the number one side effect
- Treating underlying deficiencies or trialing a different statin
- The benefit is proportional to the risk!

# Who will benefit more from a life jacket?


# Primary Prevention: Hypertension

- 51.9% of deaths due to hypertension are in women.

- This is also known as the “silent killer”



# Primary Prevention: Hypertension

What about BP goals?

- American Heart Association/American College of Cardiology define hypertension as a systolic pressure ≥130 mmHg or a diastolic pressure ≥80 mmHg
- The SPRINT trial showed that intensive BP control to SBP <120 mm Hg results in significant cardiovascular benefit in high-risk patients with hypertension compared with routine BP control to <140 mm Hg

**BP Goal:** Keep systolic **<120 mmHg** for high-risk patients

# Primary Prevention: Blood sugar

- Those with diabetes when compared to those without diabetes have a higher prevalences of coronary artery disease. There is also tend to have higher extent of ischemia and more like to have an MI and a silent MI

- **Prevention includes:**
  - Routine physicals for early detection and monitoring
  - Incorporating early lifestyle modifications such as diet and exercise
  - Medications to glycemic control

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 31, 2005 VOL. 352 NO. 13

# A Randomized Trial of Low-Dose Aspirin in the Primary Prevention of Cardiovascular Disease in Women

Paul M Ridker, M.D., Nancy R. Cook, Sc.D., I-Min Lee, M.B., B.S., David Gordon, M.A., J. Michael Gaziano, M.D., JoAnn E. Manson, M.D., Charles H. Hennekens, M.D., and Julie E. Buring, Sc.D.

# Aspirin for primary prevention

- Women's Health Study found decrease rate of ischemic stroke with 100 mg aspirin every other day for 10 years
- Physician's Health Study found decreased rate of heart attack but not stroke
- More recent assessments found questionable benefit, some evidence of harm
- Most recent recommendations are based on age, and calculated 10-year risk of CVD
- Benefit based on risk

✔ Low-dose aspirin for **high-risk patients**
✘ NOT recommended for **low-risk women** (risk of bleeding)

# HRT and CHD


- Initially thought to increase risk
- Negative effects limited to > 10 years post menopause
- Possible increased stroke risk
- Dosing and type of estrogen used play a factor

❌ No increased heart disease risk
for **healthy women <10 years post-menopause**
⚠ Potential risks: Stroke, blood clots

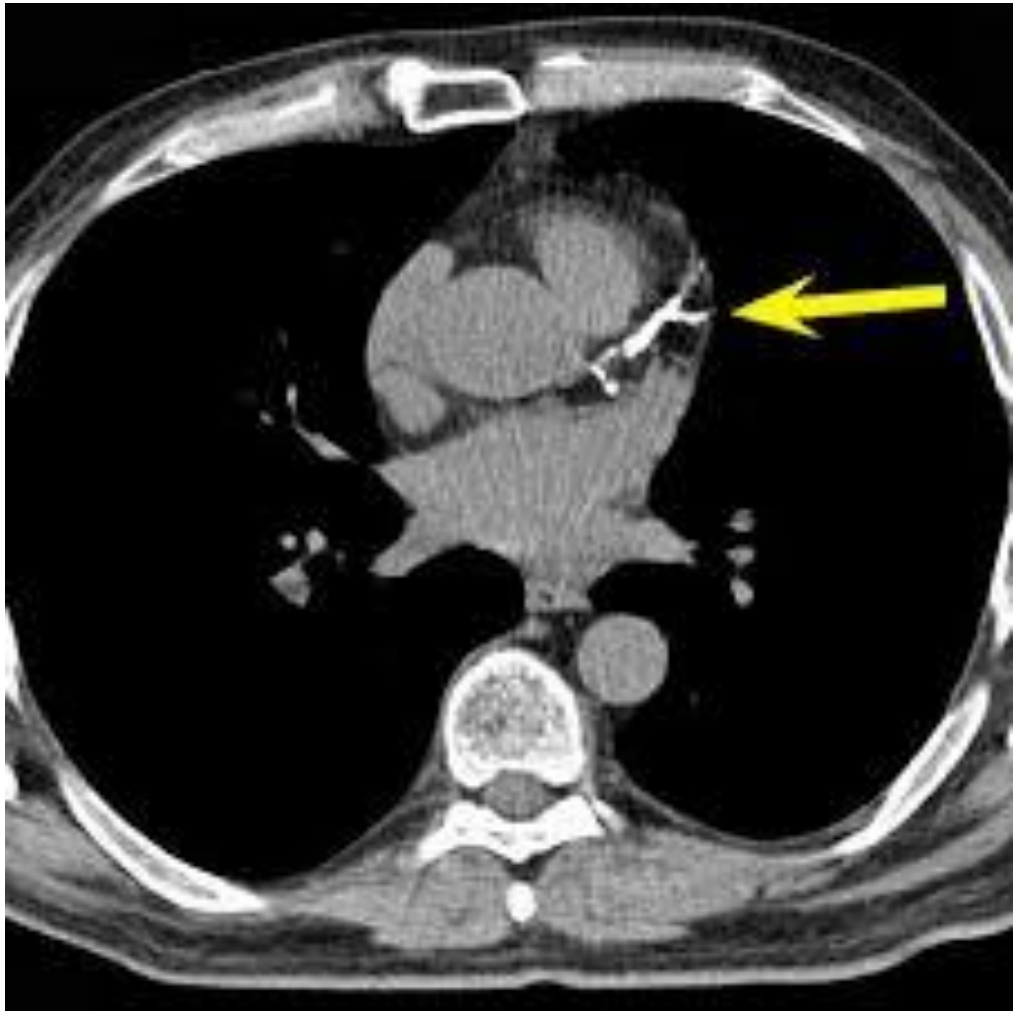
# Screening for CHD

- In the absence of symptoms, no clear role for screening beyond routine risk factor screening/check ups
- Routine exercise is an excellent tool
- Baseline fitness can help
- Coronary Calcium Scores

**Who should get screened?**

- **Routine BP, cholesterol, & blood sugar checks**
- **Coronary Calcium Score for high-risk women**

# Coronary Calcium Score



Circulation
Volume 113, Issue 1, 3 January 2006; Pages 30-37
https://doi.org/10.1161/CIRCULATIONAHA.105.580696

EPIDEMIOLOGY

# Distribution of Coronary Artery Calcium by Race, Gender, and Age

## Results from the Multi-Ethnic Study of Atherosclerosis (MESA)

Robyn L. McClelland, PhD, Hyoju Chung, MS, Robert Detrano, MD, Wendy Post, MD, MS, and Richard A. Kronmal, PhD

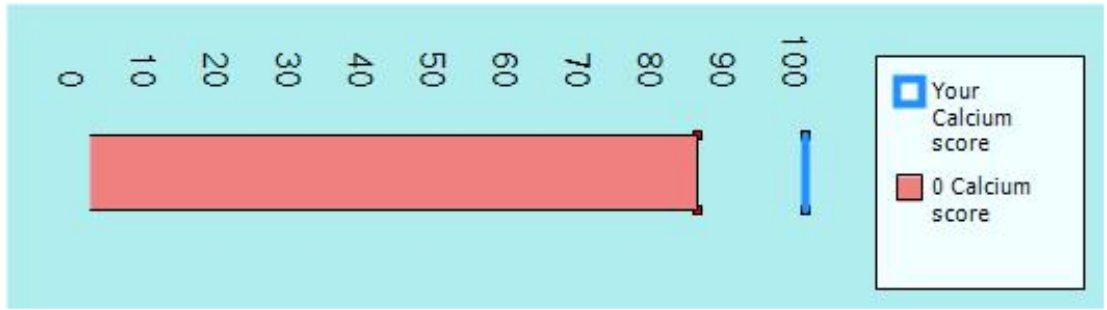
The estimated probability of a non-zero calcium score for a white female of age 50 is 16 %.

**Percentiles and Calcium Scores for: white female of age 50**

| 25th | 50th | 75th | 90th |
|---|---|---|---|
| 0 | 0 | 0 | 8 |

**The observed calcium score of 200 is at percentile 99**
**for subjects of the same age, gender, and race/ethnicity who are free of clinical cardiovascular disease and treated diabetes.**

**Chart 1: Percentiles**



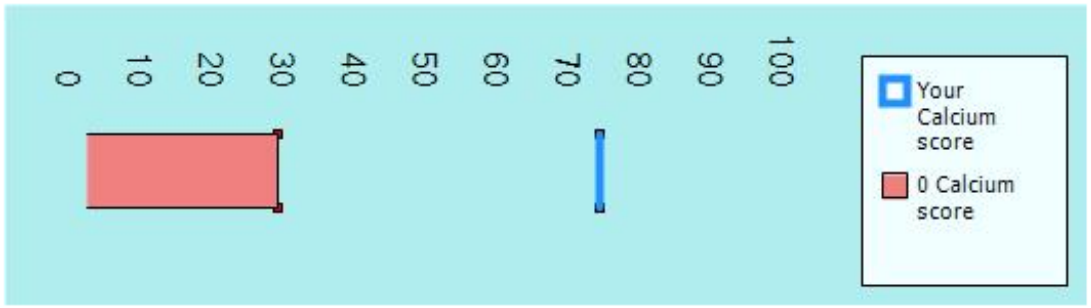

The estimated probability of a non-zero calcium score for a white female of age 75 is 73 %.

**Percentiles and Calcium Scores for: white female of age 75**

| 25th | 50th | 75th | 90th |
|---|---|---|---|
| 0 | 49 | 237 | 649 |

**The observed calcium score of 200 is at percentile 72**
**for subjects of the same age, gender, and race/ethnicity who are free of clinical cardiovascular disease and treated diabetes.**

**Chart 1: Percentiles**



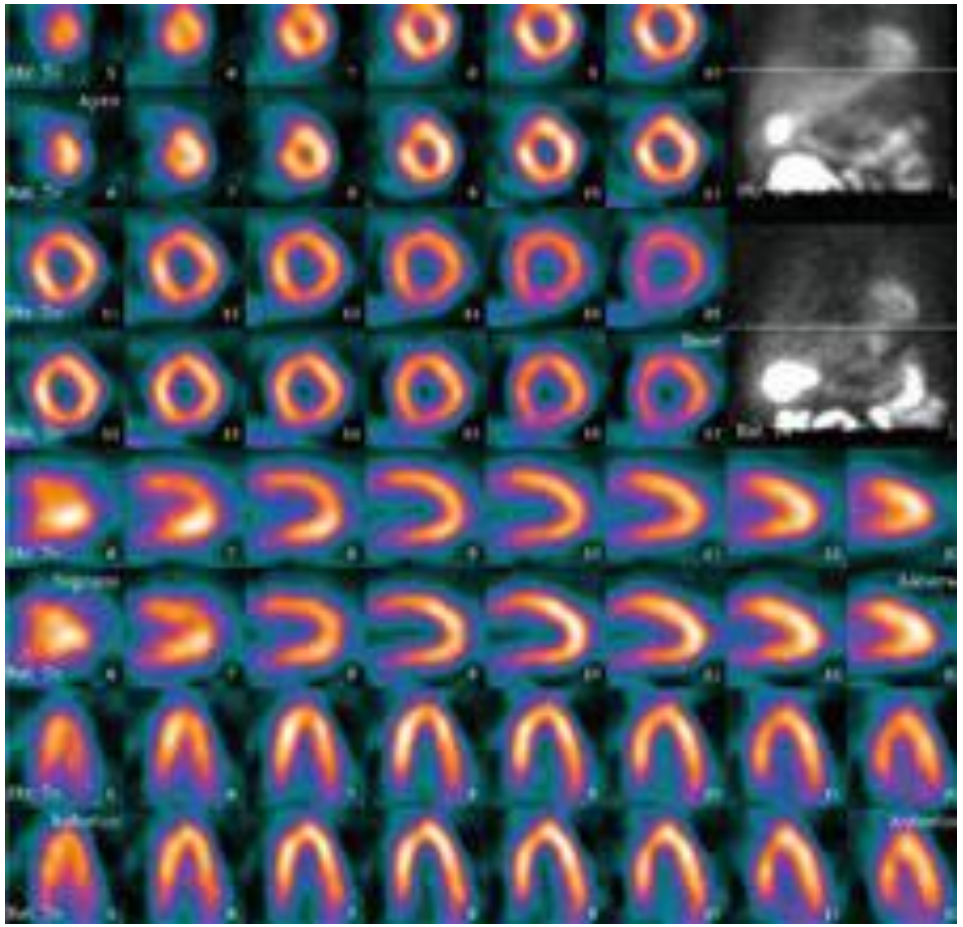
# Signs and symptoms of CHD

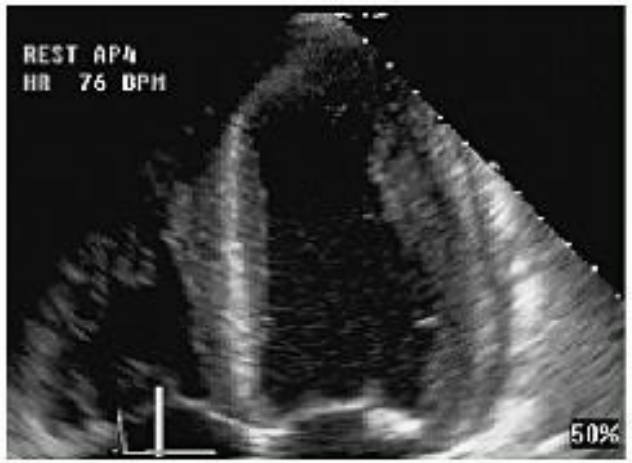
- Exertional chest discomfort
- Shortness of breath
- Exertional fatigue
- Difficulty completing physical chores
- Pain in legs with walking

# Stress testing

# Stress testing

- Exercise treadmill stress testing is the standard
- Functional capacity is the #1 predictor of outcomes
- Up to 20% of women will have false positive ECG stress test
- Further testing with imaging can be necessary




REST AP4
HR 76 BPM
50%


INPOST AP4
HR 119 BPM
T01 00:01:16
40%


REST AP2
HR 77 BPM
50%


INPOST AP2
HR 119 BPM
T01 00:01:23
40%

# 5 SIGNS of a Heart Attack for Women

The American Heart Association lists these signs of heart attack in women and warns that women who have any of them should call 9-1-1 and get to a hospital right away.

1

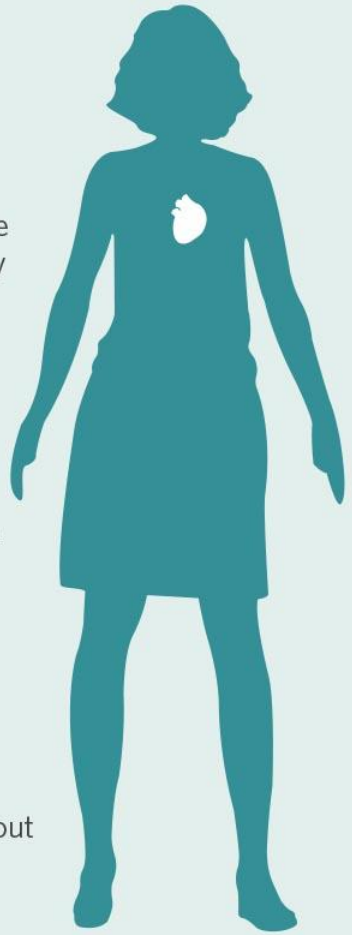
Uncomfortable pressure, squeezing, fullness or pain in the center of your chest. It lasts more than a few minutes, or goes away and comes back.

2

Pain or discomfort in one or both arms, the back, neck, jaw or stomach.

3

Shortness of breath with or without chest discomfort.



4

Other signs such as breaking out in a cold sweat, nausea or lightheadedness.

5

As with men, women's most common heart attack symptom is chest pain or discomfort. But women are somewhat more likely than men to experience some of the other common symptoms, particularly shortness of breath, nausea/vomiting and back or jaw pain.

Source: The American Heart Association

✅ **Typical (Men & Women):**

- chest pain
- shortness of breath

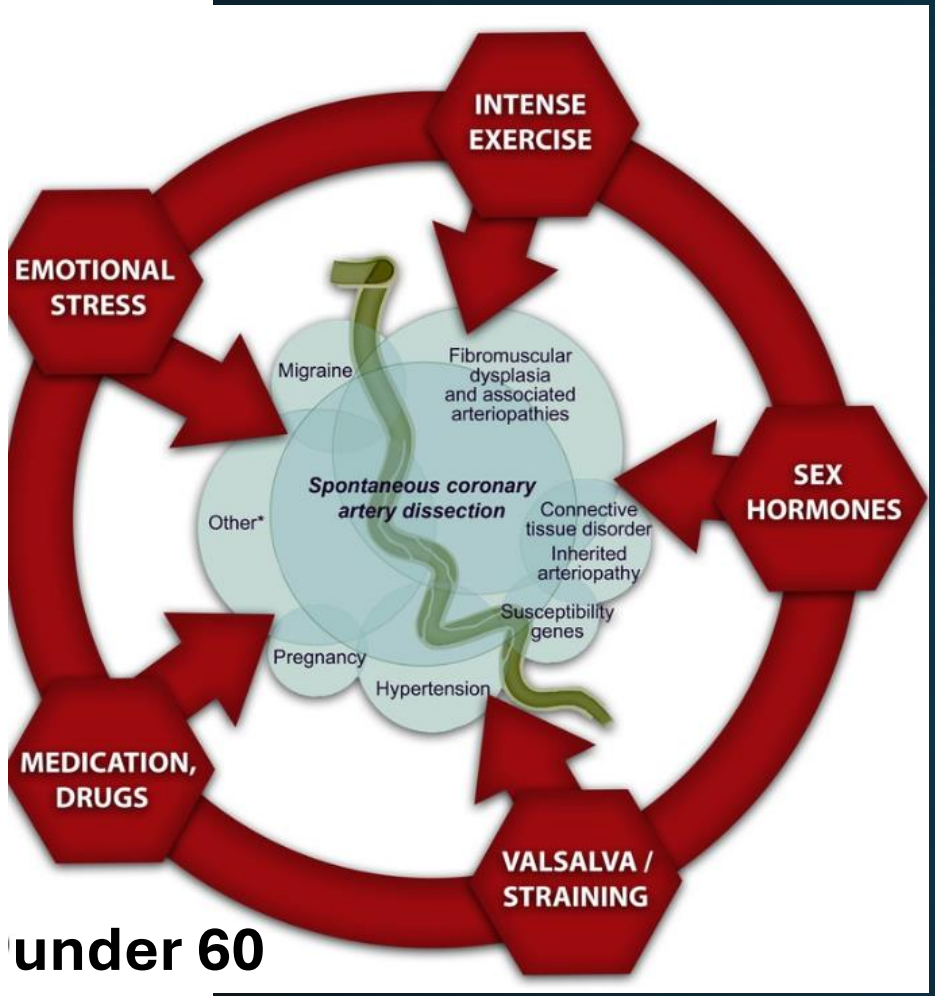
❌ **Women-Specific:**

- fatigue
- nausea
- jaw pain
- dizziness

# Spontaneous Coronary Artery Dissection (SCAD)

SCAD is coronary artery dissection that is not associated with atherosclerosis or trauma

- Women comprise approx. 90% of cases
- Most common cause of MI in women below the age of 60
- SCAD is the most common etiology of heart attack in pregnant women



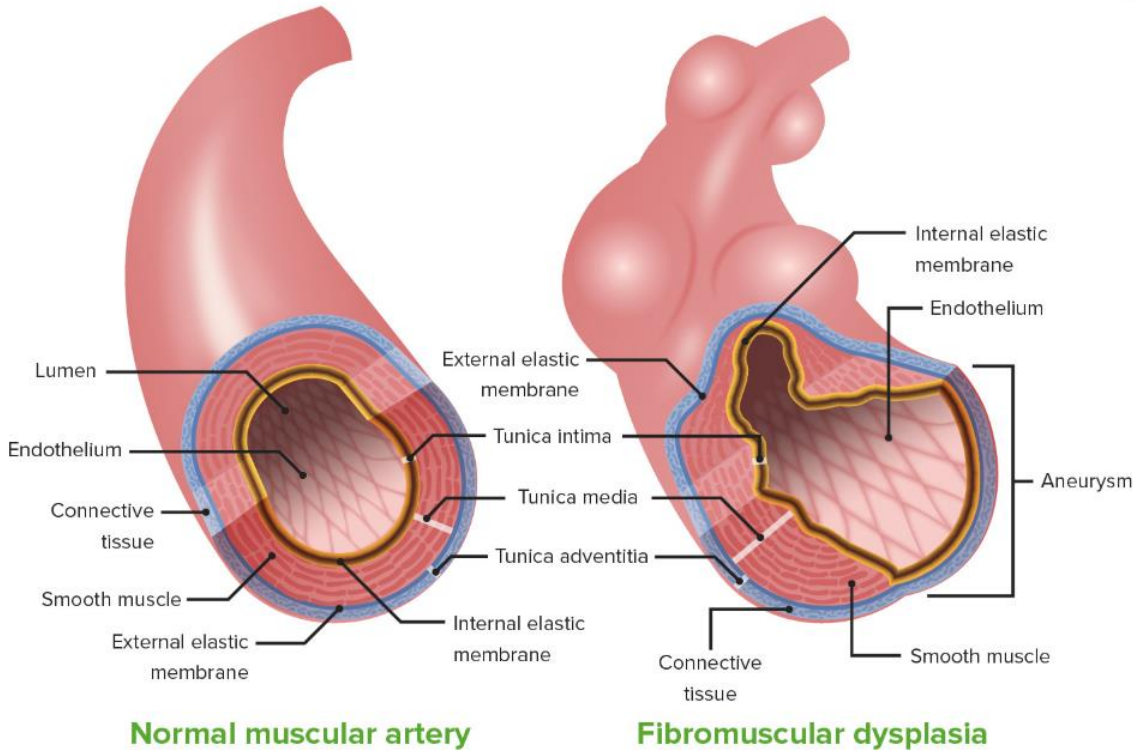

**SCAD = Leading cause of heart attack in women under 60**

- Often occurs in pregnancy
- Related to connective tissue disorders

# Spontaneous Coronary Artery Dissection

SCAD is often the first sign there is an underlying vascular condition.

- FMD caused stenoses, aneurysms, and dissections in medium sized arteries.
- Screening for FMD is recommend with head to pelvis cross-sectional imaging with MRA or CTA
- SCAD has also need connected to other genetic and connective tissue diseases in approx. 4-10%. This includes conditions such as vascular Ehlers-Danlos, Loeys–Dietz syndrome, Marfans, polycystic kidney disease, or aortic aneurysm



# Spontaneous Coronary Artery Dissection

**Treatment/management**

PCI is often used for patients with MI and CAD but generally is avoided in SCAD if possible due to risk of dissection, extension of dissection, occlusion or hematoma

CABG reserved for high-risk patients with multivessel dissections, left main dissections or failure of PCI

Typically medical therapy is preferred. Vessels are expected to heal.

The data on beta blockers comes from a cohort study in 2017 out of Vancouver that showed reduced rates of recurrent SCAD on BB

There is limited data on medical management of SCAD

# Key Takeaways

*Heart disease is preventable!*

Women’s symptoms are different – know the signs

Regular screenings & healthy lifestyle = best protection.

**Take Action Today:**

Schedule a heart checkup

Make one small heart-healthy change

# Questions?

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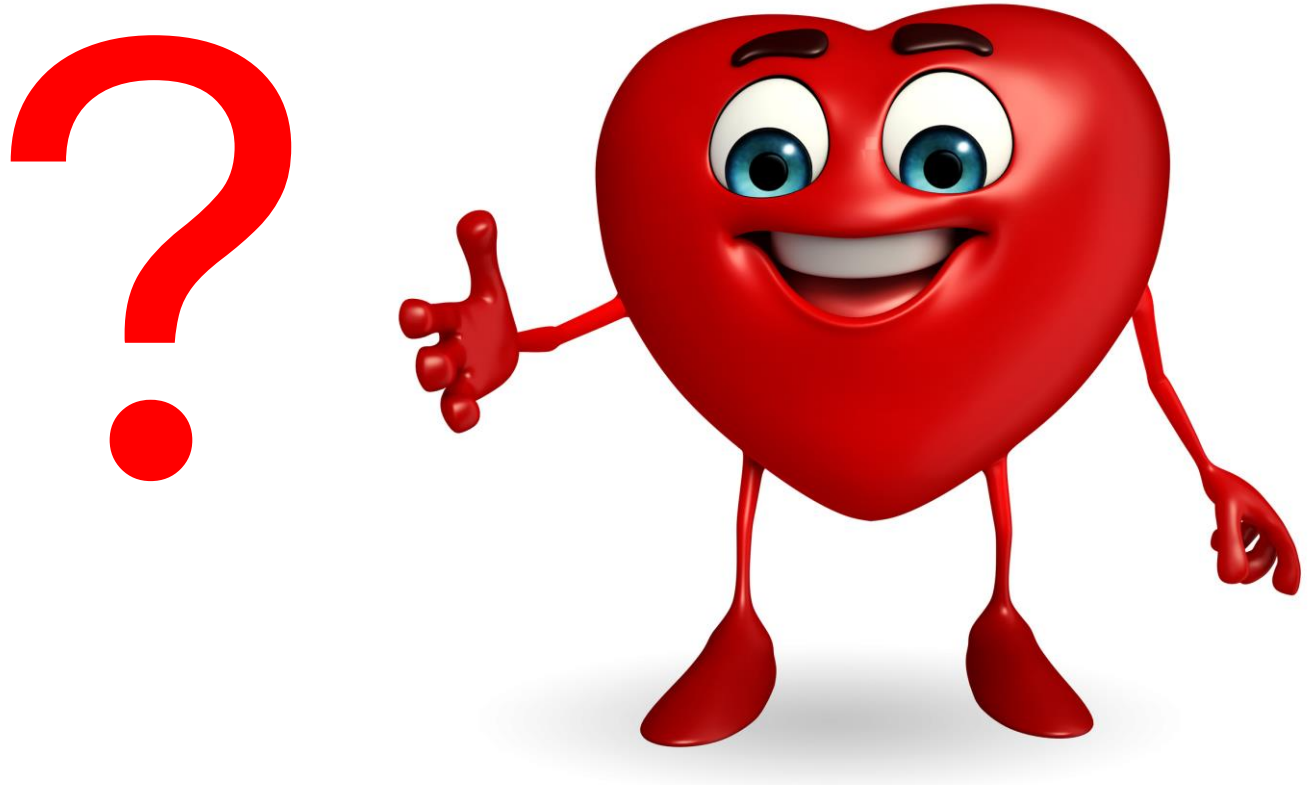
CARDIOLOGY ASSOCIATES



# Sources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- Overview of primary prevention of cardiovascular disease in adults – UpToDate
- Prevalence of and risk factors for coronary heart disease in patients with diabetes mellitus – UpToDate
- Aishat F Mustapha, Anna M Goebel, Bryan J Wells,, Sex and Gender Differences in Cardiovascular Disease: A Review of Spontaneous Coronary Artery Dissection, *US Cardiology Review 2023;17:e15.*https://doi.org/10.15420/usc.2023.02