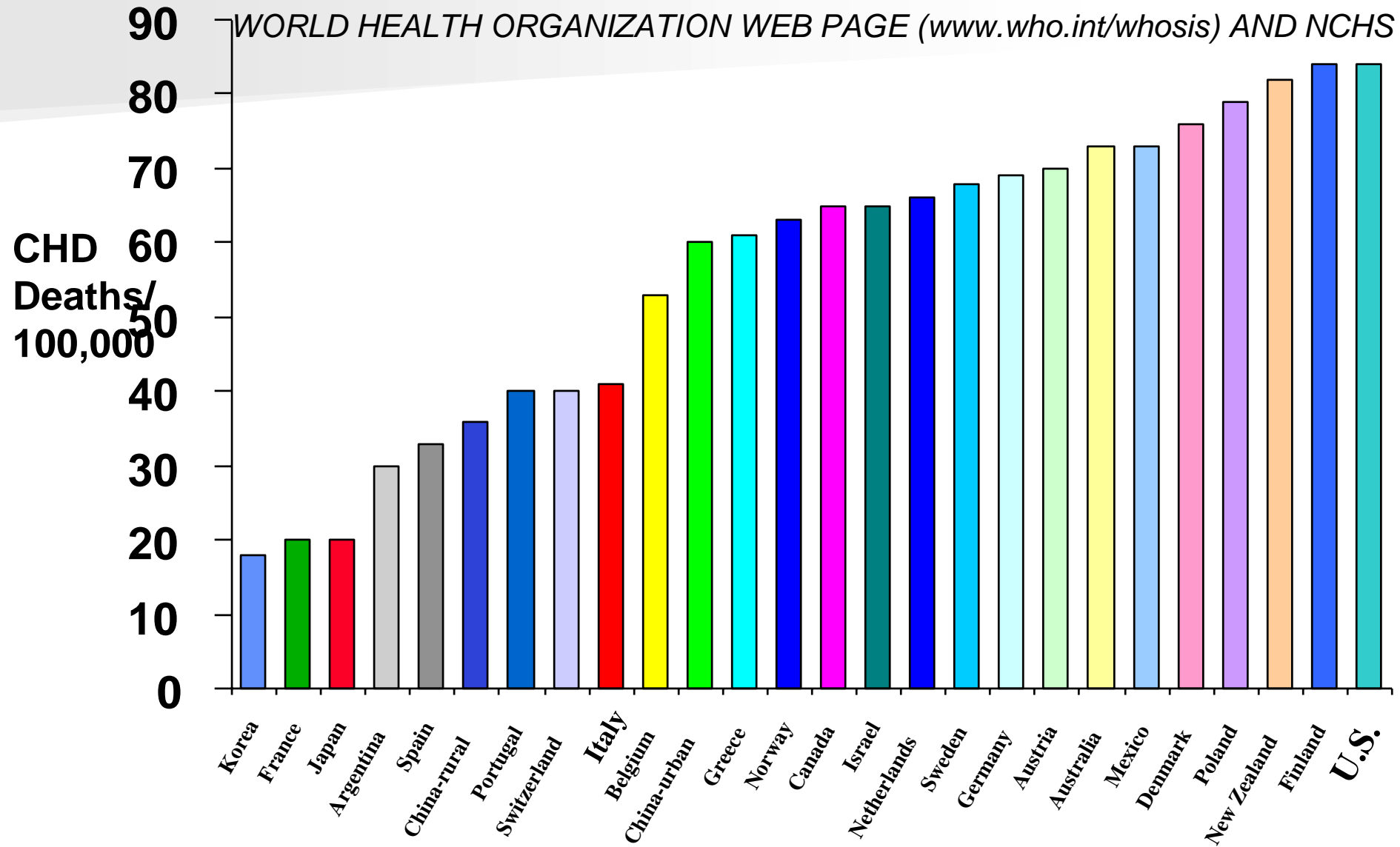


Terminology

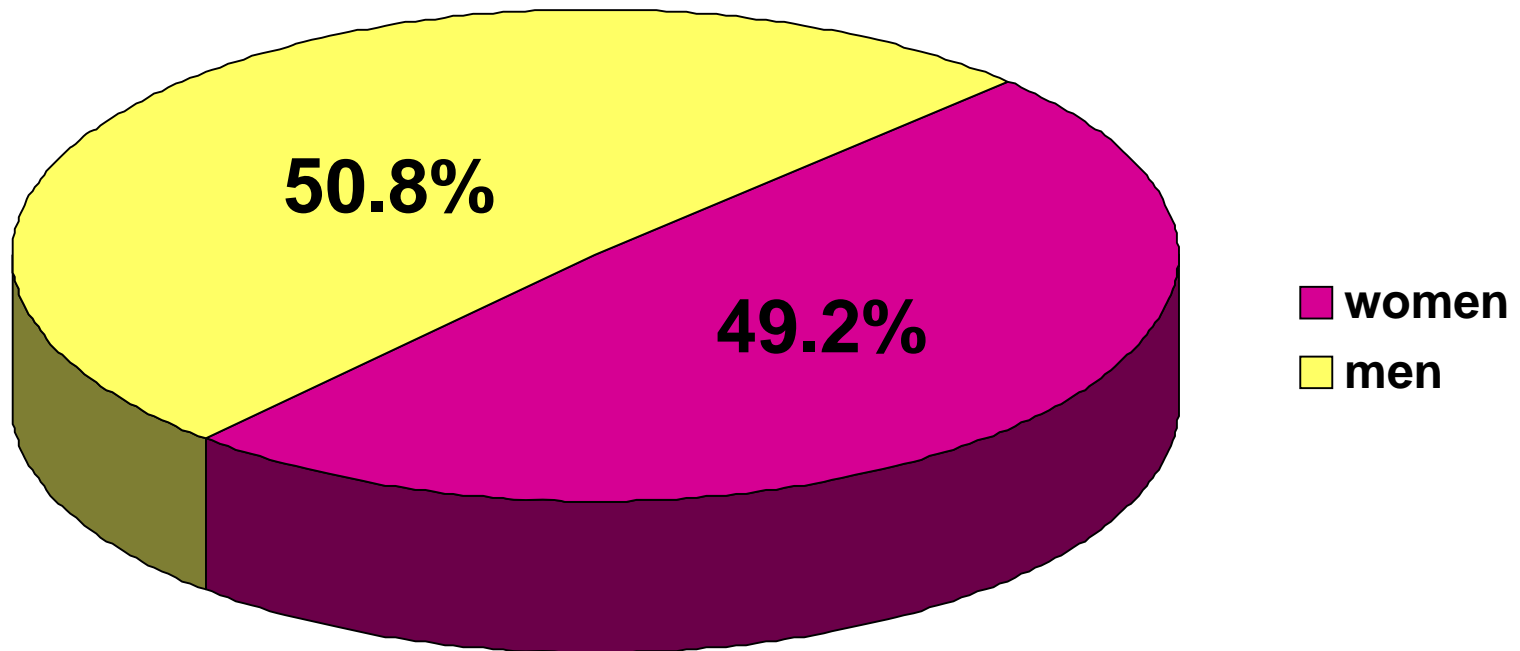
- **Atherosclerosis**
 - Literally “hardening of the arteries”
 - Cholesterol build-up in the walls of arteries often accompanied by calcium
- **Coronary Heart Disease = Ischemic Heart Disease = Coronary Artery Disease = Cardiovascular Disease**
 - Atherosclerosis or cholesterol build-up in the walls of the coronary (heart) arteries leading to blockage
- **Stenosis**
 - Blockage of an artery; usually >50% to cause symptoms
- **Ischemia**
 - Lack of blood flow to the heart usually caused by a blockage
- **Angina**
 - Symptom a patient will develop due to a blocked coronary artery
 - Often but not always chest pain
- **Myocardial Infarction = “Heart Attack”**
 - Worse case scenario where a blood clot forms in an artery (usually with a mild cholesterol blockage) causing a complete occlusion (100% stenosis)
 - Over time (minutes to hours) heart muscle dies and the pump is weakened
- **Angiogram = Cardiac Catheterization**
 - Invasive test involving injection of contrast (dye) into an artery through a catheter or tube inserted into the heart via the arm or leg
- **Angioplasty**
 - Unblocking an artery using a balloon catheter
 - Usually performed during a cardiac catheterization
- **Stent**
 - Unblocking an artery using a metal coil pressed into the artery wall using a balloon catheter

Coronary Heart Disease Death Rates in Selected Countries



Coronary Heart Disease Mortality in United States

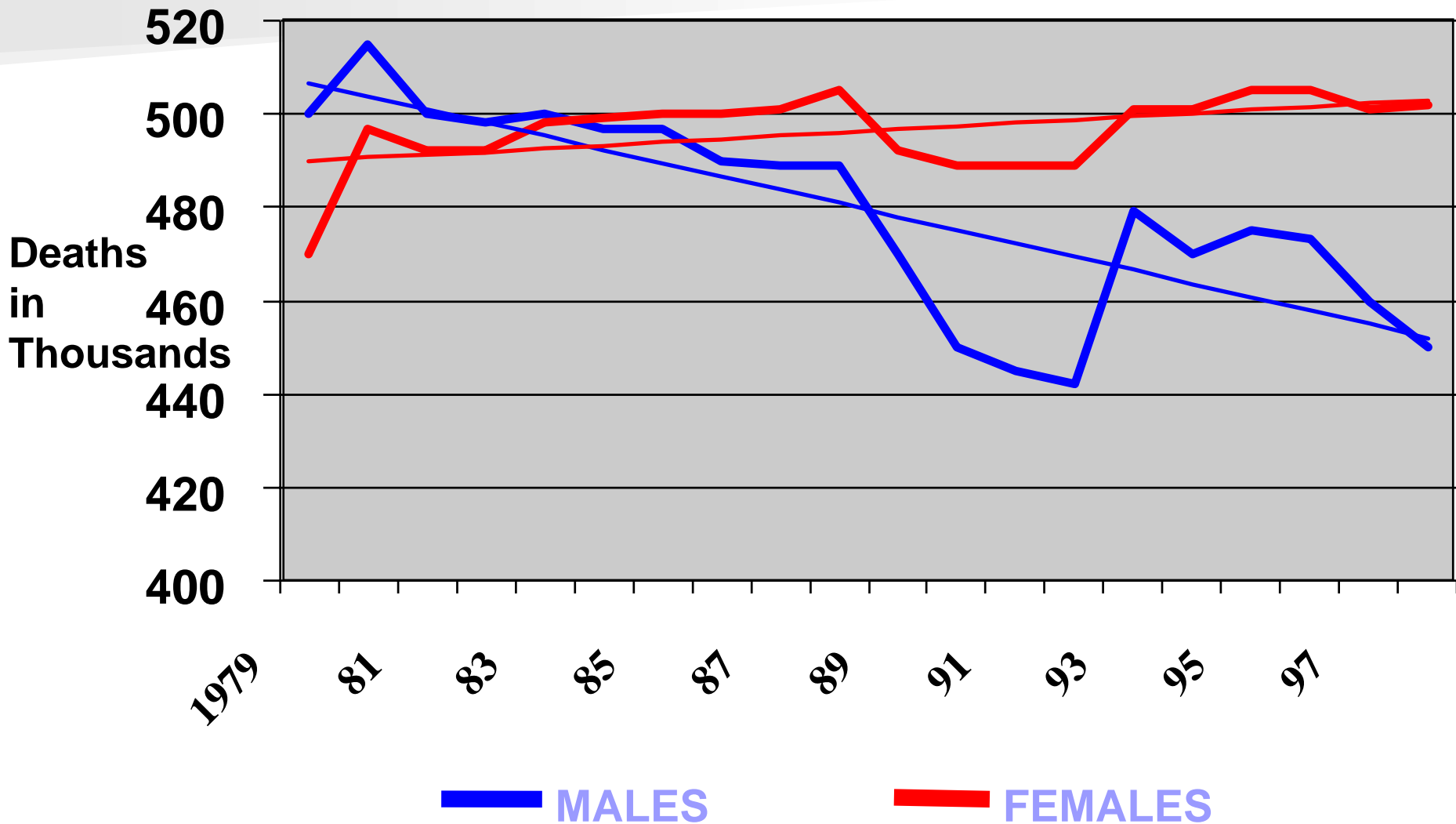
(total deaths = 476,176)



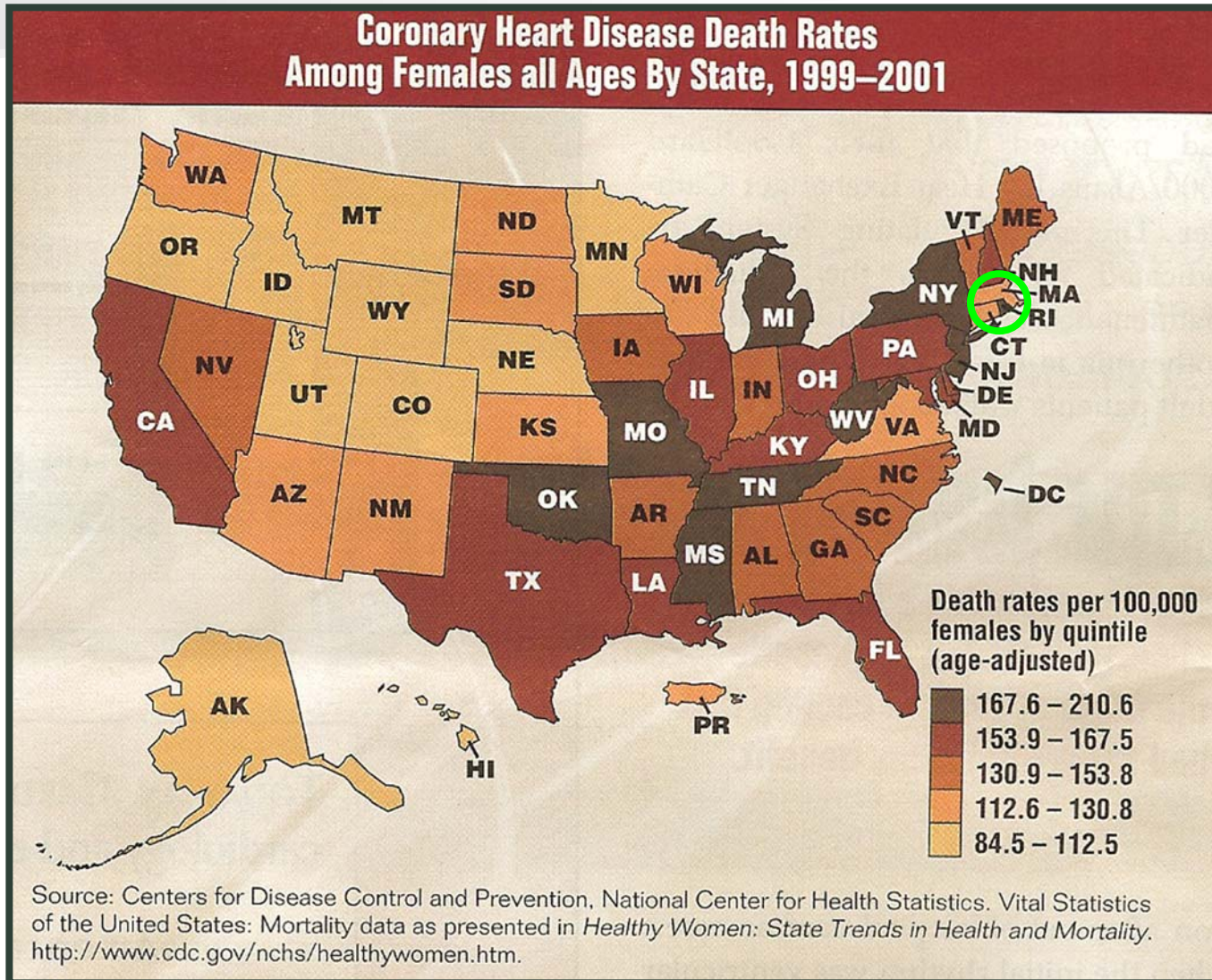
American Heart Association. Dallas, Tex. American Heart Association, 1998.

Cardiovascular Disease Mortality Trends United States 1979-1998

CDC/NCHS AND THE AHA



Coronary Heart Disease Death Rates in Women - Rhode Island



Problems Specific to Women

- Women are more likely to have symptoms suggesting a heart problem but not have significant blockage in their coronary arteries
- Stress tests are less accurate in women
- Of women with chest pain and “normal” coronary arteries, many continue to experience debilitating symptoms (health care costs, poor quality of life)
- Women with coronary artery disease (CAD) (blockage) are often diagnosed late relative to men and may therefore have a worse long-term outcome (worse prognosis)
- Young women have a worse outcome after heart attacks, stents and bypass surgery compared with older women
- The bodies’ own estrogen protects against developing CAD but hormone replacement therapy may be associated with adverse cardiac events such as heart attacks

Symptoms – Classic Angina

- Central chest pain behind the sternum
- Pressure-like, squeezing, “like an elephant on my chest”
- Not sharp or stabbing
- Builds up over seconds to minutes (not instantaneous)
- Lasts minutes (angina) to hours (heart attack), not seconds
- May be associated with
 - Shortness of breath
 - Sweats
 - Nausea
 - Dizziness
 - Not usually palpitations
- May radiate to
 - Left arm
 - Neck
 - Lower Jaw
 - Back (between shoulder blades)
- Worsened by
 - Cold
 - Exertion especially after meals
- Relieved by
 - Rest
 - Nitroglycerine tablets

Women Have Atypical Angina More Often Than Men

- Equal likelihood of exertional angina
- More likely to have
 - Pain in the back, neck, jaw and shoulder
 - Chest pain at rest
 - Chest pain at night
 - Chest pain with mental stress
 - Shortness of breath, fatigue and nausea
- Less likely to have
 - Frontal chest pain
 - sweats

Tests to Diagnose Coronary Artery Disease (CAD)

■ Non-Invasive Tests

- Electrocardiogram (EKG) – more often abnormal versus men
- Stress Tests – less accurate versus men
 - Treadmill test (watch the EKG during exercise)
 - Add Nuclear imaging (Thallium, Sestamibi or Cardiolyte, Tetrafosmin) (take pictures of the heart to measure blood flow)
 - Stress Echocardiography (sound waves to watch the heart beat)
- CAT Scans
 - Electron beam (looking for coronary artery calcium, “hardening of the arteries”) (does not show blockages)
 - CT angiography (multi-slice, spiral, high-resolution)

■ Invasive Tests

- Cardiac Catheterization
 - Coronary angiography

Treatment of CAD in Women

- For Women With Severe Blockages and Symptoms - Angioplasty, Stenting and Bypass Surgery
 - Similar success rates to men
 - More complications
 - Worse short-term outcome
 - Similar long-term outcome
 - Gender gap is closing with new treatments such as drug-coated stents
- Medications - Similar benefit versus men
 - Mild Blood Thinners - Aspirin (controversial) and Plavix
 - Beta-blockers (slow down the heart rate, lower blood pressure)
 - Ace-inhibitors (lower blood pressure, lower the work of the heart)
 - Cholesterol lowerers (Statins) (Lipitor, Zocor, Crestor, Pravachol, Lescol, Mevacor)
 - Potent Clot dissolvers for Heart Attacks (TPA)
 - Nitrates (Nitroglycerine)

Conclusions – Chest Pain in Women

- “Typical” symptoms (angina) are less often present
- Non-invasive tests: less accurate for diagnosis
 - Newer tests may help (stress-echo, CT Angiography)
- The finding of normal or minimal CAD is common (>50%) highlighting the need for better screening tests
- Significant CAD is often discovered relatively late versus men which leads to a worse prognosis
- Of those women labeled as “normal”:
 - most have some detectable CAD (with a worse prognosis)
 - Micro-vascular dysfunction is common (~50%)
- For those women with angina and/or any cholesterol build-up (blockage)
 - use of medications should be similar to men
 - results of angioplasty, stenting and bypass are similar to men and improving
 - Risk factor modification is paramount: meaning stop smoking, treat the blood pressure, treat the diabetes, treat the high cholesterol, lose weight, and exercise