

Hearts and Hormones

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HEARTS

- American Heart Association (AHA) updated guidelines on cardiovascular disease (CVD) prevention in women
 - Review guidelines
 - Highlight the updates/changes
- Role of hormones in cardiac disease
 - What we know
 - What we do not know

Guidelines for Preventing CVD in Women

- Lifestyle Interventions
- Major Risk Factor Interventions
- Medication Interventions

Lifestyle Interventions: Cigarette Smoking

- DO NOT DO IT
- Medications
- Behavioral program or formal smoking cessation program



Physical Activity

- 150 minutes/week of moderate exercise OR 75 minutes/week vigorous aerobic exercise in episodes of at least 10 minutes throughout the week
- Additional benefit if you get 300 min/week
- Muscle/strength train 2 days per week or more
- Should exercise 60-90 min/day to lose weight or sustain weight loss



Cardiac Rehabilitation

- Formal Physician Guided Program
- Community Based Exercise Program
 - Recent acute coronary syndrome or coronary revascularization
 - New onset or chronic angina
 - Heart failure and LVEF less than 35%
 - Recent cerebrovascular event (stroke)
 - Peripheral arterial disease



Dietary Intake

- Lots of fruits and vegetables
- Whole grain, high fiber foods
- Fish at least 2x per week
- Limit saturated fat, cholesterol, alcohol, sodium and sugar
- Avoid trans-fatty acids



Weight Maintenance/reduction

- Women should maintain or lose weight through an appropriate balance of physical activity, caloric intake, and formal behavioral programs to achieve:
 - BMI < 25 kg/m²
 - Waist size < 35 inches

Risk Factor Interventions: Blood Pressure

- Optimal level and lifestyle
 - <120/80 mm Hg
 - Start medications when bp > 140/90 or 130/80 if chronic kidney disease or diabetes
- Medications:
 - Thiazide diuretics
 - Beta blockers
 - ACE Inhibitors/ARB



Cholesterol

- Lipid and lipoprotein levels: optimal levels and lifestyle
 - LDL-C <100 mg/dL
 - HDL-C >50 mg/dL
 - triglycerides < 150 mg/dL
 - non-HDL-C < 130 mg/dL (total cholesterol minus HDL)



Cholesterol in high risk women

- Medications for LDL-C lowering, high-risk women
 - Goal LDL < 100 mg/dL
 - Goal of < 70 mg/dL reasonable in very high risk women (recent ACS or multiple poorly controlled risk factors)



Cholesterol; At risk women

- Medications for LDL-C lowering, other at risk women
 - If LDL-C is >130 mg/dL with multiple risk factors and absolute CHD risk 10-20%
 - If LDL-C is >160 mg/dL and multiple risk factors even if 10 year risk $< 10\%$
 - If LDL-C is >190 mg/dL regardless of other risk factors
 - In women >60 with CHD $>10\%$ if hsCRP > 2 mg/dL



Cholesterol

- Medications for low HDL-C or elevated non-HDL-C
 - Niacin or fibrate if HDL-C is < 50 mg/dL OR non-HDL-C is elevated (> 130 mg/dL) in high risk women after LDL-C goal is reached



Diabetes Mellitus

- Diabetes Mellitus
 - Lifestyle and medications can be useful in women with diabetes to achieve an HbA_{1c} <7%, if this can be accomplished without significant hypoglycemia



Preventive Drug Interventions

- Aspirin
- Warfarin
- Beta Blockers
- ACE inhibitors/ ARBs
- Aldosterone blockade

Classification of CVD Risk in Women

Risk Status	Criteria
High Risk (≥ 1 high-risk states)	Clinically manifest CHD
	Clinically manifest cerebrovascular disease
	Clinically manifest peripheral arterial disease
	Abdominal Aortic Aneurysm
	End-stage or chronic kidney disease
	Diabetes mellitus
	10-year predicted CVD risk $\geq 10\%$

Risk Status	Criteria
At risk (≥ 1 major risk factors)	Cigarette smoking
	SBP ≥ 120 or DBP ≥ 80 mm HG or treated hypertension
	Total cholesterol ≥ 200 mg/dL or HDL-C < 50 mg/dL or treated for dyslipidemia
	Obesity, particularly central adiposity
	Poor diet
	Physical inactivity
	Family h/o premature CVD occurring in first-degree relatives (< 55 men or < 65 women)
	Metabolic syndrome
	Evidence of advanced subclinical atherosclerosis
	Poor exercise capacity on treadmill test
	Systemic autoimmune collagen-vascular disease (lupus, rheumatoid arthritis)
	History of preeclampsia, GDM, PIH

Classification of CVD Risk in Women

Risk Status	Criteria
Ideal cardiovascular health (all of these)	Total cholesterol < 200 mg/dL (untreated)
	BP <120/<80 mm Hg (untreated)
	Fasting blood glucose <100 mg/dL (untreated)
	BMI <25 kg/m ²
	Abstinence from smoking
	Physical activity at goal: Adults > 20 y > 150 min/wk moderate or > 75 min/wk vigorous intensity
	Healthy (DASH-like) diet



What are the changes?

- Threshold for treatment lowered to $\geq 10\%$ risk over 10 years from 20 %
 - Risk assessment tools tend to underestimate risk in women
 - Women are more likely than men to experience a stroke vs a heart attack



What are the changes?

- Pregnancy complications increase CV Risk for Women; Real world stressed
 - Women with pregnancy complications of multiple types are at risk
 - Preeclampsia, gestational diabetes, preterm birth, small for gestational age, third trimester bleeding



What are the changes?

- Thresholds softened for aspirin and glycemic control in diabetes
 - Aspirin not as important in diabetics due to risks
 - HgbA₁C <7% can have adverse effects of too aggressive control in some women
 - Use statins with elevated CRP level



HORMONES

- What are the effects of hormones (particularly estrogen and/or progesterone) on the cardiac system and cardiac health?



What we know

- Effects of menopause on cholesterol
- Effects of estrogen on cholesterol
- Effects of progesterone on cholesterol



Cholesterol Changes

- Menopause
 - No change on total cholesterol
 - Increase LDL (13 points)
 - Decrease HDL (5 points)
 - Increase triglycerides (14-15 points)
- Estrogen replacement
 - Increases HDL
 - Decreases LDL
 - No significant change in heart disease
- Progesterone replacement
 - Increases LDL
 - Decreases HDL



Statistics

- CVD is leading cause of death in women
 - 250,000 women dies each year
- Clinically appears 10 years later than men
 - First MI 20 years later than men
- Menopause is one of the strongest risk factors for CVD
 - Suggests a strong role of hormones



“Monkey Business”

- Studies show estrogen prevents plaque/calcium formation
 - 4 groups of monkeys
 - Control
 - Removed ovaries, no hormones
 - Removed ovaries, hormones immediately
 - Removed ovaries, hormones delayed



Historical Observational Studies

- Population based trials show a 40-50% decrease in CVD events and death in women taking hormones
- Specifically, decreased risk in
 - Fatal and nonfatal MI
 - Sudden cardiac death
 - Detection of CAD by angiography
- Most of these studies not considered scientifically “good” studies



Randomized Clinical Studies

- Women's Health Initiative (WHI)
 - Designed to look at hormones in chronic disease prevention
 - MI, stroke, and CVD
 - 27,000 women aged 50-79 from 1993-1998
 - Stopped early due to “harm” with HRT at 5.2 years
 - MI risk increased 29%
 - Stroke increased by 41%
 - VTE increased by 111%



Why the difference?

- Study design
 - Did not differentiate age/time since menopause
 - Duration of therapy
- Type of hormones used



Re-evaluation of WHI

- Timing of initiation
 - Most observational studies patients were younger than 55, within 2-3 years of menopause
 - Most clinical trials 63-64 years, more than 10 years past menopause
 - Controlling for these, WHI shows ET reduced CHD risk in women 50-59
 - Women who initiate HT more than 10 years beyond menopause are at increased risk for CHD



Re-evaluation of WHI

- Duration of therapy
 - Observational studies show the longer HT is associated with reduced risk of CHD and mortality
 - WHI shows pattern of lower risk of CHD in women who used HT for 5 or more years



Re-evaluation of WHI

- Coronary Artery Calcium
 - Observational and WHI trial shows less coronary artery calcium after 5-7 years than those on placebo
 - ET initiated by recently postmenopausal women may slow the development of calcified atherosclerotic plaque



Re-evaluation of WHI

- Results of observational and clinical trials are mixed
 - Different studies show different trends
 - No statistical significance
- No studies indicate HT reduces the risk of recurrent stroke



Re-evaluation of WHI

- Data from observational and clinical studies who in increased risk of VTE with oral HT
 - In WHI, risk is lower in women who started before age 60



NAMS Position Statement (2010)

- Hormone therapy is currently not recommended as a sole or primary indication for coronary protection in women of any age. Initiation of HT by women ages 50-59 years or by those within 10 years of menopause to treat typical menopause symptoms (eg. vasomotor, vaginal) does not seem to increase the risk of CHD events. There is emerging evidence that initiation of ET in early postmenopause may reduce CHD risk.



KEY points

- Hormone therapy should NOT be used for primary prevention of cardiovascular disease
- Younger (50-59) postmenopausal patients should not avoid hormone therapy due to cardiovascular concerns without other cardiovascular risk
- Hormone therapy in early postmenopause may decrease CHD risk
- Keep your eyes out for new information!

