

**Gender Differences in Cardiology: The Heart Truth and More!**  
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**1. Learning Objectives**

This session will

- Enhance your understanding of the difference between sex and gender in cardiovascular disease (CVD)
- Identify gender specific CVD risk factors for women
- Share knowledge related to the Heart & Stroke Foundation's Heart Truth Campaign

**2. 1400 angioplasties/stents**

- 680 cardiac surgeries
- 97 ICD insertions / 149 EPS/RFA cases
- 750 patients to Cardiac & Pulmonary Rehab, Heart Function Clinic
- 1600 AMI/ACS admissions
- 3500 cardiac catheterizations (75% Male 25% Female)

**3. Sex or Gender?**

For many years women have been ill-served by male dominated health care system  
Men's Health Forum Boston Women's Health Book Collective, 2007

**4. However...**

- Men die younger than women
- Have higher rates of injury and most illnesses
- Exhibit more health –risk behaviour
- Visit doctors and clinics less

**5 So.....**

Men too have not benefited from a male-dominated health care system!!  
Underwood, 2004, White & Cash, 2004, White & Holmes, 2006

**6. Two perspectives for CVD....**

- Biological perspective (Sex)
- Social perspective (Gender)

**7. Sex differences**

- Biologic (genetic, biochemical, cellular & hormonal factors)
- Sometimes it's just too easy to blame everything on biologic differences  
Leads to how we respond to..
- Disease Prevention Activities
- Risk Taking Behaviour
- Help-Seeking Behaviour

**8. Men and women of different ethnic backgrounds seek medical help for symptoms of ACS Within different time intervals & For different reasons**

**9. And....**

- Large regional and socio-economic differences related to access to cardiac services in Canada
- Post MI patients in low socio-economic neighbourhoods are less likely to have access to cath (male or female) regardless of their proximity to a hospital with cath facilities (Pilote et al, 2003)  
Ask yourself....What your perceptions & experiences are with First Nations, mentally challenged & obese people?

**10. So.....**

- Biologic based comparisons set too-simple an explanation that.....

—Leads to assumptions

—That do very little to help us as nurses meet the needs of the diverse men & women we care for. Can J CV Nurs Vol 18,2008

**11.** 8 times more women die from HD and stroke each year than from breast cancer

- Men are more likely to develop heart disease early in life - Women tend to "catch up" around menopause
- Women experiencing heart disease or stroke are often under-diagnosed or managed differently than men.

**12.** 2007 HSF Annual Report

- Progress in managing women's heart health has not kept pace with men's
  - 1<sup>st</sup> time in history men & women's death from CHD and stroke are nearly equal (36,823 w. vs 37, 004 m.)
  - Women's death rate is 16% higher in first 30 days post MI
  - Women have higher in-hospital death rates
  - Fewer women see a cardiologist post MI
  - Less likely to have CABG and angioplasty
- WHY?

**13.** Signs & Symptoms tend to be unrecognized

- Women receive less aggressive treatment than men
- Early menopause (under the age of 40) increases the risk of HD
- Fewer are referred to Cardiac Rehab (11%) CACR Guidelines, 2004

**14.** Isn't heart disease just heart disease, whether it's in a man or a woman?

- We have gaps in our knowledge about the prevention and treatment of heart disease in women.
- Women historically haven't been included in scientific research studies to the extent men have. Hayes, Mayo Clinic 2008 <http://www.mayoclinic.com/health/heart-disease/HB00040>

**15.** New view of heart disease in women Harvard Health Productions Jan, 2007

- In the 1970s
- Coronary Artery Surgery Study 1st major heart study to include women, who made up 25% of the 25,000 participants.
- The findings were baffling:
- A woman with a positive stress test was 4.5 times more likely than a man with a positive stress test to have an angiogram showing no blockages.
- The researchers took this to mean that stress testing was unreliable in women.
- They also concluded that women had a much lower incidence of coronary artery disease than men.
- The cause of the women's chest pain was left unexplored.

**16.** New view of heart disease in women Harvard Health Productions Jan, 2007

- The next few decades saw major advances in the diagnosis and treatment of coronary artery disease.
- The cardiovascular death rate declined steadily - but more in men than women
- Women had angioplasties and bypasses, but they didn't do as well as their male counterparts.
- More of them suffered heart attacks or congestive heart failure after treatment.
- Even women whose coronary arteries were clear continued to develop and die from ischemic heart disease (IHD).

**17.** By 2000 in the US heart disease was claiming 60,000 more women than men every year. Women's Ischemia Syndrome Evaluation (WISE) 1999-2008

- In 1996, the NIH decided that these gender disparities couldn't be ignored any longer.
- more women dying of heart disease
- more female heart patients required longer hospital stays
- and had higher medical bills than males

•18. The WISE study was designed to answer three questions:

- How does IHD develop in women without arterial blockages?
- Would some other cardiac imaging method provide better clues to IHD in such women?
- What role does estrogen and other female hormones play?

**19.** What Is Happening?

- Vascular dysfunction..
- occurs both in women with clear arteries and in those with obvious coronary artery narrowing
- coronary arteries and smaller vessels feeding the heart muscle don't dilate properly and can't accommodate increased blood flow

—This condition has been dubbed **coronary microvascular dysfunction, or microvessel disease.**

## 20. Microvascular disease

Women's Ischemia Syndrome Evaluation (WISE)

- Microvessel disease helps explain why so **few** women have the classic crushing chest pain that signals coronary artery disease
- They feel diffuse discomfort, exhaustion, or shortness of breath under stress or even during daily routines
- As vessels lose their resilience, blood flow is reduced, and the heart muscle, deprived of oxygen, gradually dies, resulting in congestive heart failure

•The WISE data may also explain why women who undergo angioplasty and bypass surgery don't fare as well as men. These women may have both coronary artery disease and unrecognized microvessel disease.

—**In such cases, opening the arteries isn't sufficient**

## 21. Coronary artery disease and coronary microvascular dysfunction compared

Probing the pathology

- How and why does coronary microvascular syndrome develop?

—Inflammation is a prime suspect.

## 22. Important Inflammatory markers

- C-reactive protein (CRP),
- Interleukin-6 (IL-6)
- Serum amyloid A (SAA)
- Women with the highest levels were at much greater risk for a coronary event or death within five years than those with low levels

## 23. Atherosclerosis Progression: The Rest of The Story

- Inflammation isn't the only cause of coronary microvascular dysfunction.
- Family History, high LDL cholesterol, low HDL cholesterol, high triglycerides, elevated blood sugar, hypertension, sedentary lifestyle, and obesity - were implicated.
- <http://www.reynoldsriskscore.org/default.aspx>.
- They uncovered some other risk factors as well, including these:
  - Premenopausal high blood pressure.*
    - Hypertension, particularly in younger women, is a major risk factor for IHD
  - Anemia
  - Polycystic ovarian syndrome (PCOS).*
    - Women with PCOS have many components of the metabolic syndrome
    - Have erratic levels of circulating estrogen (estrogen can reduce inflammation)

24. Women's Ischemia Syndrome Evaluation (WISE) study," Parts I and II, *Journal of the American College of Cardiology* (Feb. 7, 2006), vol. 47, No. 3, Suppl. 1, pp S4-S20 (Part I) and S21-S29 (Part II)

### **Are risk factors different for men and women?**

- Traditional risk factors for coronary artery disease — smoking, high cholesterol, high blood pressure and obesity — are detrimental to both men and women
- Certain factors may play a bigger role in the development of heart disease in women
  - Metabolic syndrome — a combination of abdominal obesity, increased blood pressure, elevated blood glucose and triglycerides.
  - Mental stress and depression
  - Smoking is much worse for women than men.
  - Low levels of estrogen before menopause is a significant risk factor for developing cardiovascular disease in smaller blood vessels (microvascular disease).

## 25. The connection between depression and heart disease in women

- Depression 2 x as common in women as in men
- Increases risk of heart disease by 2 – 3 times
- 1 in 5 women with MI or is hospitalized with heart failure has evidence of depression.
- Depression makes it difficult to maintain a healthy lifestyle

26. Women & heart disease: What's new? Cheek, Sherrod, & Tester Nursing 2008 January 2008 Vol38 (1)
- Genetics - Cardiovascular disease has a strong genetic component, and inherited susceptibility patterns appear in families.
  - Diabetes poses a **greater risk** than any other factor. In the Nurses' Health Study
    - women with diabetes
    - had 7 x more CVD events than other women
    - and 50% die of CVD
    - Young women with diabetes lose any premenopausal protection, so their risk of developing CVD equals that of men their age.
27. Women & heart disease: What's new? Cheek, Sherrod, & Tester Nursing 2008 January 2008 Vol38 (1)
- Women who take oral contraceptives and smoke are more likely to have an MI or stroke
  - Women under 50 who smoke are 3 x more likely to die of heart disease
  - Dyslipidemia doubles a woman's risk of CVD compared with women with normal lipid profiles (Framingham Heart Study)
28. Women & heart disease: What's new? Cheek, Sherrod, & Tester Nursing 2008 January 2008 Vol38 (1)
- Low levels of high-density lipoprotein (HDL) are a much stronger predictor of CVD mortality in women than men.
  - Obesity is another key risk factor.
    - Central obesity poses an even greater risk than increased body mass index (BMI).
    - A healthy waist circumference is less than 35 inches (87.5 cm) in women and less than 40 inches (100 cm) in men
    - The desired BMI is 18.5 to 24.9 kg/m for both sexes. National Population Health Study
29. Women & heart disease: What's new? Cheek, Sherrod, & Tester Nursing 2008 January 2008 Vol38 (1)
- Stress puts a woman at greater risk for developing CVD and at greater risk for poor outcomes
  - A sedentary lifestyle can contribute to obesity, dyslipidemia, hypertension, and hyperglycemia.
30. Women & heart disease: What's new? Cheek, Sherrod, & Tester Nursing 2008 January 2008 Vol38 (1)
- Exercise can reduce cardiovascular risk by increasing HDL levels and decreasing BP, blood glucose, and low-density lipoprotein (LDL) levels.
    - Exercise can cut a woman's CVD risk by 50%
    - May decrease the risk of a second MI in a postmenopausal woman who's already had one.
    - 30 minutes of moderate-intensity physical activity (such as walking) on most if not all days of the week.
    - Women who need to lose weight or sustain weight loss should engage in at least 60 minutes of moderate-intensity physical activity (such as brisk walking) on most if not all days of the week.
31. Barriers to Health Improvement
- 39.7% of women cited lack of time
  - 39.2% lack of willpower (coaching)
    - Self blaming
    - Self-defeating
  - Being overweight
  - Having child and home care responsibilities
32. Women in Western Canada
- Are more likely to
    - Be physically active
    - Consult alternative HCP's
    - Take action to improve health
    - Consume > 5 servings of fruit and veggies/day
33. Women....
- With high incomes and higher education are more likely to
    - Engage in health promoting practices

- Less likely to engage in risky health practices
- 2 x as likely to report excellent/very good health

#### 34. Women...

- With poorest health practices
- 20 -44 yrs old
- Low income
- Less education
- Living in the North and in the Maritimes
- And some single women

#### 35. Women & heart disease: What's new? Cheek, Sherrod, & Tester **Nursing 2008** January 2008 Vol38 (1)

- Postmenopause is an independent risk factor for women
- HRT is not recommended to prevent or manage CVD for postmenopausal women.
- HRT is appropriate to treat menopause symptoms, such as hot flashes and vaginal dryness (does not appear to have increased risk of cancer less than 4 yrs of therapy).
- Estrogen alone may provide benefits, although it's not safe for women with an intact uterus.

#### 36. Nurses Health Study Heart Headlines Vol 14, 2008

- Low risk women have 83% lower risk of heart disease
- Non-smoker
- Normal weight
- Active

#### 37. Women & heart disease: What's new? Cheek, Sherrod, & Tester **Nursing 2008** January 2008 Vol38 (1)

Tips..

- If your patient isn't having acute chest discomfort but may be at risk for CVD, conduct a risk assessment using the Framingham tool.

#### 38. Heart & Stroke Foundation: Heart Truth Campaign

- A national public health education campaign to raise awareness that heart disease and stroke are the leading cause of death for Canadian women.
- The campaign will run for three years, targeting women over the age of 40, and across ethnicities and backgrounds through education and outreach activities.
- To increase awareness that heart disease and stroke is the leading cause of death among Canadian women
- To increase awareness of the risk factors and the warning signs that can lead to heart disease and stroke
- To encourage women to talk openly with their doctors and take preventative action to control their risk factors
- To empower women to take charge of their heart health, including seeking the services they need if symptoms occur  
<http://www.longwoods.com/articles/images/news-heart-truth.htm>

#### 39. Gaps and Recommendations

- Policies should encourage all Canadians to take pride in developing a healthy lifestyle with a focus on healthy eating and healthy activity every day
- Weight prejudice must be made unacceptable
- Positive body image should be encouraged and diversity valued
- Body image disparagement, chronic dieting, and exercise to improve appearance (instead of health) need to be acknowledged as oppressive
- Physical activities that mothers can participate in with their families should be encouraged
- Research should focus on women becoming more active without focusing on appearance and weight control Women's Health PHAC Publication [www.phac-aspc.ca](http://www.phac-aspc.ca)

#### 40. Sex...

- May denote biological differences between men and women, but is an imperfect measure of 'gender differences'

- Many causes of ill-health lie outside the health care sector and sphere of medicine that are gender related
- What do we know about the social determinants of women's and men's health?
- Are there differences in the health problems women and men experience?
- If so, how do we explain them?

#### 41. Neighborhood Socioeconomic Environment and Incidence of Coronary Heart Disease: A Follow-up Study of 25,319 Women and Men in Sweden

Sundquist, Winkleby, Ahlén, Johansson *Am J Epidemiol* 2004; 159:655-662.

Where you live has a significant effect on coronary heart disease risk beyond the individual effect.

#### 42. To prevent CVD deaths. Key Determinants of Health

- Income and Social Status (poverty)
- Social Support Network
- Education and Literacy
- Employment/Working Conditions
- Social Environments (social exclusion)
- Physical Environments
- Personal Health Practices and Coping Skills
- Healthy Child Development
- Biology and Genetic Endowment
- Health Services
- Gender
- Culture

#### 43. Male or Female

- Be Happy
- Get an education!
- Don't smoke
- Don't smoke and take birth control pills or HRT (women only!)
- Eat a healthy well balanced diet
- Maintain a healthy weight
- Be physically active
- Live to Love and Love to Live!!!
- And for Heaven's sake.....
- Pick from the right gene pool!!!!

#### 44. Good Reads!!

- **Evidence-Based Guidelines for CVD Prevention in Women: 2007 Update** *Circulation*, 2007
- Nieca Goldberg: **Women are Not Small Men: Life-Saving Strategies for Preventing and Healing Heart Disease in Women**, by
- Nieca Goldberg: **The Women's Healthy Heart Program: Lifesaving Strategies For Preventing And Healing Heart Disease**
- Malcolm Gladwell: **Blink** (Author of "the Tipping Point")
- Eckhart Tolle: **A New Earth: Awakening to your Life's Purpose** (Author of "The Power of Now")
- Kevin Leman: **What Your Childhood Memories Say About You: And what you can do about it**

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