



Institute for Women's Health Research

Putting Women's Health First

February 2011

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Dear Colleagues and Friends,

A year ago this month, the Institute for Women's Health Research released its first monthly e-newsletter and the topic was Women and Heart Disease. Since then, there have been eleven editions of this publication-- representing 11 different topics--that have demonstrated how sex differences exist well beyond the reproductive system.

This month, we are revisiting a topic, cardiovascular disease (CVD), because there has been a significant increase in the awareness that there are many sex differences in the manifestation, diagnosis and basic biology of heart disease in women compared to men. This has led to more researchers studying heart disease through a sex and gender lens. Some of the newest findings related to sex differences in cardiovascular disease are summarized below. The reader can also click on the links to our blogs that expand on these topics where indicated. We have also included an update of the status of participation of women in CVD clinical trials.

The Institute Staff



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AT NORTHWESTERN UNIVERSITY

Women and Cardiovascular Disease

Cardiovascular disease (CVD) is generally classified as:

- Coronary Heart Disease (the most common) that can lead to heart attack and angina due to plaque buildup in the arteries reducing blood supply to the heart,
- heart failure leading to inadequate blood supply to the body organs,
- Ischemic Heart Disease (conditions that lead to reduce blood supply to the heart itself) and



- stroke.

Factors that measure and predict heart health are discussed below and include hypertension (high blood pressure), cholesterol levels, peak heart rates, hormones and prevention strategies.

U.S. Statistics

More than 42 million women are currently living with some form of heart disease and more women than men die of heart disease annually. Each year, over 200,000 women die from heart attacks and 159,000 women die from congestive heart failure (Lloyd-Jones, Brown, 2010).

Hypertension in Women

High blood pressure (hypertension) is a major risk factor for heart attack and the most important risk factor for stroke. A woman's risk for high blood pressure rises if she is obese, has a family history of high blood pressure, is pregnant, or takes certain types of birth control pills. African American women have higher average blood pressure levels compared to Caucasian women.

Post menopausal women have an increased risk of hypertension and among older adults, more women than men have hypertension. Up until recently, hypertension research has been done mainly on males and little is known about the way women's bodies manage blood flow through their vessels. A researcher at University of Arkansas (Kluess, 2010) is using a new technique to examine the release of a neurotransmitter in small blood vessels to determine if the neurotransmitter breakdown (e.g., ATP) in women is different than in men. More research is needed to determine if ATP overflow and metabolism is different between the sexes and could help us understand why hypertension increases during menopause. [Learn More...](#)

Cholesterol and Heart Disease

Low blood levels of "good" cholesterol (high density lipoprotein or HDL) appear to be a stronger predictor of heart disease death in women than in men in the over-65 age group. High blood levels of triglycerides (another type of fat) may be a particularly important risk factor in women and the elderly. Studies show that women's cholesterol is higher than men's from age 55 and older.

NIH researchers have found that women's cholesterol levels correspond with monthly changes in estrogen. This variation could indicate a need to take a woman's monthly cycle into consideration while evaluating her cholesterol measures. On average, the cholesterol level can vary by as much as 19% during a woman's menstrual cycle. While we know that taking medications that include estrogen (HRT and birth control pills) can affect cholesterol levels, we are just beginning to learn about the effects of naturally occurring hormone levels on women's cholesterol. [Learn More...](#)

Measuring Heart Rates in Women

It is universally accepted that exercise is an important tool in preventing or controlling heart disease and we now have a better understanding of sex differences in measuring peak heart rate which is the standard goal of many exercise programs.

A formula based on a large study from Northwestern Medicine provides a more accurate estimate of the peak heart rate a healthy women should attain during exercise. It will also accurately predict the risk of heart-related death during a stress test. Researchers have determined that what is a normal peak heart rate for women is lower than what it is for men. The old formula--220 minus age--used for almost four decades is based on studies of men. The new formula for women is 206 minus 88 percent of age. This new women's formula equates to a maximum heart rate of 162 beats for women at age 50. [Learn More...](#)

Aspirin Therapy

In 2002 the US Preventive Services Task Force (USPSTF) strongly recommended that clinicians discuss aspirin with adults who were at risk for coronary heart disease. This was based on five randomized controlled trials that showed 28% reduction in heart attacks. Only two of these studies included women so it was not clear whether or not this advice, based mainly on research in men, was appropriate for women. In March 2009, the USPSTF reviewed new evidence from the NIH Women's Health Initiative (WHI) and other sources and found sufficient evidence that aspirin decreases first heart attacks in men and first **strokes** in women. Their current recommendations regarding aspirin therapy for women are:

- for aspirin use in women age 55-79 when the potential benefit of a reduction in ischemic strokes outweighs any increased risk of GI bleeding
- against the use of aspirin for stroke prevention in women younger than 55 years.

The USPSTF also stated that there was insufficient evidence to assess the balance of benefits and harms of aspirin for CVD prevention in men and women older than 80. They did conclude that aspirin does increase risk for major bleeding events, primarily GI bleeding in both men and women. [Learn More...](#)

Participation of Women in CVD Research Studies

Historically, most cardiovascular studies were conducted exclusively in men. The good news is that participation of women in randomized clinical trials (RCTs), the gold standard for research, has increased over time. A recent analysis reported in *Circulation* (Melloni C et al, 2010) reviewed the RCTs that supported the 2007 American Heart Association Guidelines for CVD prevention in women. What they found is:

- women represented only one-third of the study subjects
- enrollment of women in RCTs had increased during the last four decades, and
- the proportion of women in studies remain much lower than the proportion of women who have the disease.

The authors also noted that specific reasons for low enrollment were not clearly defined and that more efforts need to be made in trial design to have sufficient statistical power to do sex-based stratification and to report sex-specific results in publications.

This latter concern, reporting results by sex differences, was also the theme in a recent publication in the journal *Nature* (2010) written by Institute Director Teresa Woodruff, PhD, and two of her recent graduates.

Sources:

Gulati M, *Circulation*. 2010 Jul 13. Epub 2010 Jun 28

[U.S. Preventive Services Task Force banner U.S. Preventive Services Task Force Women's cholesterol levels vary with phase of menstrual cycle](#)

Kluess H, *J Physiol*. 2010 Aug 15. Epub 2010 Jun 21.

Kim A, Tinggen C, Woodruff TK, *Nature* 2010 Jun 10.

Lloyd-Jones D, Adams R, Brown T. *Circulation*. 2010

Upcoming Events

February 3, 2011 **Note: New Date Due to Snow Storm**

[Hotflash Havoc - a film of menopausal proportions](#)

Tickets: \$25 includes a parking validation

Northwestern University, Chicago, Illinois

February 4, 2011

[National Wear Red Day](#)

American Heart Association

February 10, 2011

[Women's Heart Health: Risk Factors for Cardiovascular Disease](#)

Chicago, Illinois

February 17, 2011

[Women's Heart Health: Exercise Guidelines](#)

Chicago, Illinois

February 22, 2011

[Institute for Women's Health Research Monthly Forum](#)

Marla Mendelson, MD, Associate Professor,

Department of Medicine, Cardiology Division, Feinberg School of Medicine

The Risk of Heart Disease and Women of All Ages

The Risk of Heart Disease and Women of All Ages
Prentice Women's Hospital, 250 East Superior, 3rd Floor, Chicago, Illinois

February 24, 2011

[Women's Heart Health: Stress Reduction](#)

Chicago, Illinois

Health Tip

Take the quiz from the Women's Heart Foundation to determine your personal risk for health disease.

[Click here for the quiz](#)

[Illinois Women's Health Registry Update](#)

What is the heart health status of the women in our Registry? According to the most recent data on women who completed our Year 3 registry survey, 11% reported high blood pressure (>140/90), significantly lower than the U.S. statistic of 30% indicating a relatively healthy group of women. However, 22% of our participants indicated they had increased cholesterol, which is a higher percentage than reported for the U.S. population of women (16.9%). This is somewhat puzzling and it could reflect the fact that our women may be younger and have better access to screening tests. This is exactly the type of analysis we hope to do as more women join our Registry so we can have a precise snapshot of what matters to Illinois women so we can advance women's health research.

During the months of February and March, many of you who are in the Registry will be receiving reminders to update your profile and health information. As of January 31, we have 5808 women in the Registry. Please renew your Registry when you receive notification from our Registry staff and encourage all your friends who are not part of the Registry to join! Let's get to 7,500 by the summer!

[Join the Registry Now!](#)

[Forward email](#)



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