

## Heart Disease: A Special Challenge for Women

Heart disease is the leading cause of death in the U.S. For women, it presents a special challenge:

- Heart disease kills one in every three women.
- Eighty percent of women ages 40-60 have one or more risk factors for heart disease.
- Three million American women have had a heart attack; two-thirds of those women did not make a full recovery.

U.S. medical schools and teaching hospitals, together with the National Institutes of Health (NIH), are working to reduce the number of heart disease-related deaths in women by identifying their unique risk factors and developing more effective methods to diagnose and treat heart disease in women.

The following examples of NIH-funded research advances achieved at the nation's medical schools and teaching hospitals hold promise for reducing the incidence of heart disease in women:

### **2006**

Found that heart disease goes undiagnosed in as many as 3 million women because cholesterol plaque may not build up into major blockages as it does in men, but instead spreads evenly throughout the artery wall, eventually starving the heart muscle of its blood supply. As a result, some diagnostic tests reveal "clear" arteries, falsely indicating low risk.

**Cedars-Sinai Medical Center**

**NIH funded**

Determined that calcium and vitamin D supplements in postmenopausal women have a modest benefit to bone mineral density and prevent hip fractures in certain groups, but do not prevent colorectal cancer or other bone fractures.

**Ohio State University Medical Center**

**University at Buffalo SUNY School of Medicine and Biomedical Sciences**

**NIH funded**

**2005**

Determined that the stress hormone, cortisol, causes fetal heart muscle cells to multiply faster than normal. A stressed mother's cortisol levels can cross the placenta and affect the fetus. This establishes that high stress in mother during pregnancy can lead to abnormal growth of the baby and increase its risk for heart disease.

**Oregon Health & Science University**  
**NIH funded**

Forty percent of African-American women in the Jackson Heart Study, based at the University of Mississippi Medical Center, were discovered to have metabolic syndrome, as compared with 29 percent of men. The syndrome is characterized by a concurrence of several risk factors for heart disease—abdominal obesity, low HDL cholesterol, elevated triglycerides, high blood pressure, and abnormal blood sugar.

**University of Mississippi Medical Center**  
**NIH funded**

**2004**

Discovered that the outcome of using cardiopulmonary resuscitation for cardiac arrest, in animal models, is gender dependent—female mice have a better outcome than male mice. Researchers also discovered that the outcomes could be modified by altering certain genes in mice.

**Oregon Health & Science University**  
**NIH funded**

Found that young women with two or more major cardiovascular disease risk factors (diabetes, high blood pressure, unhealthy cholesterol level, high body mass index, or smoking), screened between 1967 and 1973, were less likely to be alive in 2001 than their counterparts with none of these risk factors. Only 20 percent of the women in the study were classified as “low risk,” demonstrating the urgent need to establish heart-healthy habits among women early in life.

**Northwestern University Feinberg School of Medicine**  
**NIH funded**

**2003**

The results of some exercise tests indicate a different prognosis for heart disease in women than they do for men. An electrocardiographic finding of “ST-segment depression,” indicating low blood flow to the heart muscle, may be an ominous sign in men, but is unrelated to increased risk in women. However, two measures of cardiovascular fitness—exercise capacity and heart rate recovery—were deemed useful for predicting risk in women.

**Johns Hopkins Medical Institutions**  
**NIH funded**

Determined that high levels of C-reactive protein—an indicator of inflammation—are associated with an increased risk of developing high blood pressure in women. This suggests high blood pressure is, in part, an inflammatory disorder and that C-reactive protein can be a useful tool for identifying women who need to reduce their risk of high blood pressure.

**Brigham and Women's Hospital**  
**Harvard Medical School**  
**NIH funded**

Found that women taking combination hormone therapy have twice the rate of dementia, including Alzheimer's disease, than women not taking the medication.

**Wake Forest University School of Medicine**

**NIH funded**

**2002**

Researchers found that depression in elderly women is associated with an increased risk of heart failure. Women may have a stronger physiological response to depression than men, thereby significantly increasing their risk of heart failure.

**Emory University School of Medicine**

**Yale University School of Medicine**

**NIH funded**

Determined that digoxin therapy for heart failure had different effects in women than in men. Although the drug reduced the hospitalization rate for men, it was linked to an increased risk of death for women taking the drug, compared with women taking a placebo.

**Yale-New Haven Hospital**

**NIH funded**

**1997**

Identified a new compound that appeared to strengthen bones and improve cardiovascular health in the same way that natural estrogen does, while stopping the ability of estrogen to speed the growth of cancer in uterine cells.

**Duke University Medical Center**

**NIH funded**

Determined that even one child is enough to put working mothers at higher stress and at risk for health problems such as heart attack.

**Duke University Medical Center**

**NIH funded**

For more information about how medical schools and teaching hospitals are fulfilling the promise of medical research, go to: [www.aamc.org/research/ftp](http://www.aamc.org/research/ftp)