


# Women's Cardiovascular disease requires a Comprehensive Translational Approach

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## Abstract

High rates of morbidity and mortality are linked to heart disease in women. While many of the underlying causes of cardiovascular disease are the same for both sexes, women are more likely than men to die from coronary heart disease, have a higher rate of sudden cardiac death without symptoms, and are more likely to die from myocardial infarction than men. Although efforts to identify preventive measures have increased in recent years, the translation of information from epidemiological studies and clinical trials remains incomplete, particularly for women. The Clinical and Translational Science Award program, which was just launched by the National Institutes of Health, provides opportunities to fill in these gaps and is a one-of-a-kind chance to train a new generation of researchers who are familiar with important issues pertaining to women's cardiovascular health.

**Keywords:** Heart Disease; Informatics; Education; Translational Research

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## Introduction

These include an increased mortality rate among older women following a myocardial infarction compared to men and a higher frequency of women experiencing sudden death without prior symptoms. Physicians are often unaware of the fact that women are more likely than men to die from coronary heart disease because of these factors [1]. An update on evidence-based guidelines for cardiovascular disease prevention in women was published in. In recent years, efforts to identify preventive measures have increased. However, there is a lack of sufficient translation of information from epidemiological studies and clinical trials into clinical practice, particularly among women who may not be aware of their risk [2]. The Clinical and Translational Science Award program, which was just launched by the National Institutes of Health, provides opportunities to fill in these gaps. At the University of California Davis the CTSA program has already had a significant impact on clinical research and training methods for women's health issues. In UC Davis established its Clinical and Translational Science Center one of the first institutions to receive NIH funding for a [3]. A step-by-step strategy to gradually increase our institutional competencies, capabilities, and resources in this area was accelerated and further integrated with the funding, which accelerated and integrated an existing conscientious planning effort for translational research [4]. We have developed

novel strategies for bringing together a diverse faculty and facilitating research as a result of the development of our CTSC. Our research training programs, in particular, have benefited from the CTSC's pathway to full translational integration of trainees.

## Women's Cardiovascular disease: Recent issues

After a first myocardial infarction, women have a higher mortality rate than men, and the majority of women who suffer from an acute cardiovascular event do not recover fully. In addition, at least one risk factor for heart disease exists in the vast majority of middle-aged women [5]. Many women are unaware that they are at risk, even though established risk factors can greatly reduce the risk of cardiovascular disease. In the United States, the Framingham risk score system is used to assess cardiovascular risk and this system frequently underestimates women's actual risk. In addition, a recent study found that women had a higher relative risk of coronary heart disease than men for the common metabolic syndrome. Additionally, clinical symptoms and disease manifestations may differ depending on gender [6]. As a result, the atherosclerotic process is more dispersed in the vascular tree in women, and symptoms like fatigue, dyspnea, and pain in the shoulder or neck are more frequently associated with myocardial infarction in women than in men, making it

more difficult to diagnose. In addition to gender issues, ethnic differences exist in the distribution of risk factors and disease management. When compared to other minorities, African American women, for instance, have a higher rate of coronary heart disease and cardiovascular disease, which accounts for a larger percentage of their deaths. Additionally, although Caucasian African Americans are at a higher risk for heart disease due to the metabolic syndrome, the individual components of the syndrome are distributed differently [7]. Gender differences in the manifestation and presentation of cardiovascular disease, risk factor assessment, pathophysiologic factors, and therapeutic strategies have not been fully addressed. Progress across the entire translational spectrum—from basic science to population intervention is required to address these remaining obstacles. Initiatives in education and research infrastructure, such as the NIH's "Building Independent Research Careers in Women's Health" and related CTSA programs, offer excellent opportunities to train a new generation of researchers with a wide range of tools to solve these critical problems [8].

### Enhancement of prevention through translational strategies

This program's overarching objective is to provide women with seamless, cutting-edge, multidisciplinary cardiac health services that address all of their cardiovascular requirements. Five interconnected aspects of cardiovascular health are the primary focus of the UC Davis Women's Cardiovascular Medicine Program: screening and risk assessment to address the greater relative risk of major risk factors for women diagnostic testing and treatment with respect to gender lifestyle modification and cardiac rehabilitation and its importance to cardiovascular risk reduction; education and awareness of heart disease as the leading cause of death among women; and monitoring and evaluating, evaluating women's success and outcomes. Importantly, the Women's Cardiovascular Medicine Program has demonstrated expertise in the creation of a regional model of women's cardiovascular

healthcare for underserved regions, such as the central valley and rural northern California [9]. The CTSC has provided funding for the program's research activities, which has led to increased opportunities for community-based research studies and the CTSC's capacity to act as a coordinating center for multicentre studies, as described below. Numerous studies on nutritionally based therapies for polycystic ovary syndrome conducted in the CTSC Clinical Research Center and supported by CTSC informatics and biostatistics resources are another example of CTSA support for studies related to women's health.

### Information technology: A Key to better prevention

The Women's Cardiovascular Medicine Program received assistance from the CTSC as part of an award titled "Improving, Enhancing, and Evaluating Outcomes of Comprehensive Heart Care Programs in High-Risk Women" from the US Department of Health and Human Services Office on Women's Health. The UC Davis program was able to serve as a data-coordinating center for six dispersed locations thanks to the CTSC partnership. These locations included four academic health centers, one clinical practice center, and one mobile community-based healthcare delivery program [10]. The study's objective was to compare outcomes at six and twelve months of patient follow-up and evaluate cardiovascular disease prevention, knowledge, risk awareness, and clinical outcomes in high-risk women. Patient education and the application of the American Heart Association's recently published "Evidence-Based Guidelines for Heart Disease Prevention in Women" guidelines were part of the intervention. Over a two-year period, each participating site collected de-identified patient-specific data from the six sites on over 1,300 women's demographic, survey, and clinical information. These efforts demonstrate the nationwide CTSA program's synergistic potential and its potential to enhance specific intervention studies addressing complex diseases, such as gender-specific cardiovascular health and disease.

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