Getting to the Heart of Cardiovascular Disease in Women

By Jenna A. Bell-Wilson, MS, RD, LD

All too often, the "fairer sex" is misinformed about this crippling condition, which now affects more women than men. Finally, new studies and efforts are underway to identify and help prevent heart disease in women.

Many people know that cardiovascular disease (CVD) is the number-one cause of death in the United States (American Heart Association [AHA] 2001). Yet you may be surprised to learn that there is a higher prevalence of women suffering from one or more types of CVD than men (AHA 2006). According to the AHA's 2006 *Heart and Stroke Statistical Update* based on 2003 numbers, one in 30 women lost their lives to cancer, while one in 2.6 lost the battle with CVD (AHA 2006). Even with the widespread attention paid lately to whether mammograms save lives, the fact is that six times as many women die from CVD as die from breast cancer.

The good news is that more and more studies are being conducted to research the relationship between CVD and female morbidity and mortality. Until the body of research on women grows, however, it is essential that women learn how to protect themselves from this disease. This article will review the reasons why the medical community and the public at large remain so ill informed about women and CVD; the differences in signs and symptoms between the genders; risk factors for the condition; the hormone replacement therapy controversy; and the latest AHA nutrition guidelines for heart disease prevention.

For the purposes of this article, the term "CVD" refers to a constellation of different heart diseases; common associated conditions are described in the "Glossary of Heart Terminology"

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A Change of Heart

Despite overwhelming scientific proof that a far greater number of females die of heart disease than of breast cancer, many women are still more concerned about getting breast cancer than they are about getting CVD (Gans et al. 1999). In a study conducted by the Stanford Research Center in Disease Prevention, 200 middle-aged and older women were questioned about the risk of major diseases. Sadly, only 34 percent of the older participants surveyed knew that CVD was the leading cause of death in older women, yet among the subjects overall, the risk of breast cancer was overestimated (Wilcox & Stetanick 1999).

In an article aptly titled "It Won't Happen to Me. . . . ," researchers presented their findings after evaluating the perception of heart disease risk among women with and without a family history of breast cancer or CVD (Erblich et al. 2000). The researchers' expectations were confirmed when those with a family history of breast cancer had significantly lower perceptions of CVD risk than the other women studied. Yet surprisingly, those with a family history of CVD had the same perceived risk of breast cancer as the other women surveyed. In other words, even when women were genetically predisposed to CVD but not to breast cancer, they were just as afraid of getting breast cancer.

No one disputes that women need to appreciate that they are at risk for breast cancer and should be screened for this disease. However, many in the scientific community worry that an inflated fear of breast cancer may be adversely affecting women's understanding of their CVD risk and overshadowing the steps they should take toward prevention.

Even more troubling than the public's misconceptions about women and CVD is the lack of interest shown by the medical community. In 1998, the Centers for Disease Control and Prevention (CDC) released a report that found women were less likely than men to receive "preventative" (i.e., medical) counseling for CVD or receive recommendations regarding diet, physical activity and weight reduction (CDC 1998). This dearth of medical advice is exacerbated by the fact that women also display subtle differences in signs and symptoms when experiencing a cardiac event (Goldberg 2002). (See "Differences in Heart Attack Signs & Symptoms Between Women & Men.") All too often, these differences result in women not getting the life-saving treatment they require in a heart-related medical emergency. Underscoring the need for better education, a 1996 national survey found that women were also less likely than men to enroll in cardiac rehabilitation following an acute myocardial infarction (Mosca et al. 1999).

Disheartening Risk Factors

Although the signs and symptoms of CVD can differ between the genders, many of the risk factors for the condition are the same. According to the AHA, the risk factors for heart disease among men and women include:

- physical inactivity
- high total blood cholesterol
- high LDL cholesterol
- low HDL cholesterol
- tobacco smoking
- high blood pressure
- overweight or obesity
- diabetes mellitus, or type 2 diabetes (AHA 2006)

Researchers in Finland examined the gender differences and age-related increases in CVD and concluded that the risk factors for the condition are similar for men and women (Jousilahti et al. 1999). The risk factors evaluated included smoking, serum total cholesterol, HDL cholesterol, blood pressure, body mass index (BMI) and diabetes. Young women were found to be at a lower risk than similarly aged men, but the gap in protection diminished remarkably with age. The factors that contributed to significant differences in risk for all ages and both genders were HDL levels and smoking rates. As both genders aged, increases in serum total cholesterol, blood pressure, BMI and diabetes prevalence were associated with increased CVD incidence. However, the increase was more dramatic in women. (The authors speculated that hormone replacement therapy may help postmenopausal women combat the higher CVD risk associated with aging, but read on for another side to that story!)

The following sections review some of the risk factors that are of specific concern to women. Also included are practical risk reduction strategies that you can recommend to your female clients. Because stress is just beginning to be identified as a risk factor for CVD among women, stress management tips are also described. However, because of the complexity of type 2 diabetes and the fact that it is not unique to women and CVD, this risk factor is not covered. For information on preventing diabetes, see "National Consensus Guidelines for Clients With Medical Conditions" by Ralph La Forge, MS, in the January 2002 issue of *IDEA Health & Fitness Source.*

PHYSICAL INACTIVITY

In 2004, 39.4 percent of men and 29.0 percent of women reported doing leisure-time physical activity defined as little to moderate exercise >/= 30 minutes >/= 5 times per week, or vigorous activity >/= 3 times per week for more than 20 minutes (AHA

Glossary of Heart Terminology

While this article discusses cardiovascular disease in general terms, fitness professionals should become familiar with some of the specific conditions that fall under the broader umbrella of CVD.

Angina Pectoris: Chest pain or discomfort caused by insufficient blood flow to the heart muscle.

Aortic Aneurysm: A bulge that develops in the aorta (main artery of the heart), often as a result of damage from atherosclerosis (see below); if the aneurysm bursts, the condition can be fatal.

Arteriosclerosis: Hardening or thickening of the artery walls.

Atherosclerosis: A condition that develops when plaque (fatty substances, cholesterol, cellular waste products, calcium and other substances) lines the inner part of an artery; large and medium-sized arteries are most often affected.

Cardiomyopathy: An inflammation of the heart, usually due to a viral infection, hypertension, heart valve disease or a congenital heart defect.

Congenital Cardiovascular Disease: Heart disease that is present at birth, usually as a result of a heart defect. A congenital cardiovascular defect occurs when the heart or blood vessels near the heart don't develop normally before birth. The cause of the defect is often unknown.

Congestive Heart Failure (CHF): A condition that occurs when the heart is unable to pump enough blood to the rest of the body. CHF can result from coronary artery disease, myocardial infarction (see below), hypertension, heart valve disease, cardiomyopathy, a congenital heart defect or an infection. People with CHF are unable to exert themselves, owing to shortness of breath.

Ischemia: A condition in which the flow of blood (and therefore oxygen) is constrained and unable to reach a part of the body. Cardiac ischemia refers to lack of blood flow and oxygen to the heart muscle (myocardium).

Myocardial Infarction: A cardiac event that occurs when the blood supply within the heart is severely reduced or stopped. *Commonly referred to as a heart attack.* Plaque that builds up in the arteries can burst or tear, creating a site for blood to clot and block the artery.

Source: Adapted from the American Heart Association Heart & Stroke Encyclopedia; *www.americanheart.org.*

2006). The relative risk of CVD increases by a magnitude of 1.5 to 2.4 if people are inactive—an increase similar to that seen with high blood pressure, high blood cholesterol or cigarette smoking (AHA 2006).

The protective effect of physical activity has been well documented in men but only recently evaluated in women (Folsom et al. 1997). A survey of 72,000 women showed that moderate-intensity walking (as opposed to lower-intensity, "casual" walking) significantly reduced the risk of heart disease and stroke (AHA 2001). This survey confirmed the findings of an earlier study, which determined that lack of physical activity was associated with CVD and total mortality in both men and women (Folsom et al. 1997). Both these studies point to the beneficial impact of increasing physical activity to minimize CVD risk.

Research has also shown that sedentary people have a 30 to 50 percent greater risk of developing hypertension, another CVD risk factor (AHA 2001). In a study that examined both genders, researchers concluded that low cardiorespiratory fitness (as assessed by a maximal treadmill test) was inversely associated with CVD risk for women (LaMonte et al. 2000). Interestingly, cardiorespiratory fitness was also found to be positively correlated with high HDL and total cholesterol levels in women, even though a relationship between total cholesterol and fitness was not found.

Risk Reduction Strategies. These findings confirm that an active heart is a healthy heart! Encouraging women to include more physical activity and exercise in their daily routine is the first step to reducing their risk of CVD. Women can benefit by accumulating 30 minutes or more of moderate-intensity physical activity on most, if not all, days of the week (Mosca et al. 1999). Specifically, moderate-intensity exercise refers to working at approximately 65 to 70 percent of maximum heart rate. In laywomen's terms, this means exercising at a pace that is challenging but sustainable. Examples include walking briskly, riding a bicycle, taking a moderately challenging group exercise class, or swimming for recreation.

CHOLESTEROL LEVELS

The media have done a good job of making women understand the importance of having regular mammograms, but less ink has gone to heralding the necessity of getting a lipid profile. Yet research confirms that low levels of HDL cholesterol are predictive of CVD in women, and after age 65 such levels appear to increase in importance for women even more so than for men (Mosca et al. 1999). It has been suggested that the decrease in estrogen that women experience after menopause alters their lipid profile by decreasing HDL levels and increasing LDL levels

The American Heart Association Dietary Guidelines

The goal of the AHA's dietary guidelines is to reduce the risk of CVD and stroke through nutrition and lifestyle modifications. To achieve that aim, the guidelines do the following:

1. Make recommendations that are safe for overall health throughout an individual's life span.
2. Concentrate on dietary practices that reflect overall intake, not just a single meal.
3. Present recommendations that consider individual practices, cultural backgrounds and health status.

Here are some of the highlights of the AHA's recommendations for healthy individuals. Pass these guidelines on to your female clients:

- Achieve and maintain a healthy eating pattern that includes foods from each of the major food groups.
- Consume a variety of fruits and vegetables, and include five or more servings per day.
- Choose six or more servings per day of grain products, including whole grains.
- Include soluble fiber from grains, vegetables, fruits, legumes and nuts.
- Achieve and maintain a healthy body weight.
- Achieve and maintain a body mass index below 25. A waist circumference below 88 centimeters is recommended for women.
- Match intake of total energy (calories) to overall energy needs.
- Achieve a level of physical activity that matches (for weight management) or exceeds (for weight loss) energy intake.
- Limit intake of foods that have a high content of cholesterol-raising fatty acids.
- Maintain a saturated fat intake below 10 percent of total calories (below 7% for those with elevated LDL levels). Limit intake of trans fatty acids found in partially hydrogenated vegetable oils (usually found in cookies, crackers, other baked goods, commercially prepared fried foods and some margarines).
- All adults should eat fish, particularly fatty fish, at least two times per week.
- Limit intake of dietary cholesterol to less than 300 milligrams per day.
- In place of saturated and trans fatty acids, substitute grains and unsaturated fatty acids from fish, vegetables and legumes.
- Limit salt (sodium chloride) intake.
- Limit alcohol intake.
- Quit smoking.

Sources: Krauss, R.M., et al. 2000. AHA Dietary Guidelines, Revision 2000: A statement for healthcare professionals from the Nutrition Committee of the American Heart Association. Circulation, 102, *2284-99.*

Kris-Etherton, M., Harris, W.S. & Appel, L.J. 2003. Omega-3 Fatty Acids and Cardiovascular Disease, New Recommendations From the American Heart Association. Arteriosclerosis, Thrombosis, and Vascular Biology. *2003; 23:151.*

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(Jousilahti et al. 1999). (For more information on CVD and menopause, see "HRT to Heart.") Epidemiologic studies have also shown that, after age 50, more women than men have total cholesterol levels that exceed the recommended 200 milligrams per deciliter (mg/dl) (AHA 2001).

To address the increase in LDL cholesterol levels seen in postmenopausal women, researchers with the Women's Healthy Lifestyle Project put subjects on a diet low in fat (< 25% of total calories), low in saturated fat (< 7% of total calories) and containing 100 mg of cholesterol per day (Kuller et al. 2001). Calorie intake was restricted enough to cause weight loss of 5 to 15 pounds, and energy expenditure on physical activity was increased from 1,000 to 1,500 kilocalories per week. The results of this 54-month trial showed a significantly lower increase in LDL cholesterol among those who altered their diet and activity level. Significant decreases in triglycerides, blood pressure, blood glucose and insulin were also observed. Although the increase in LDL cholesterol was not prevented entirely, the results showed that lifestyle changes could blunt the rise in LDL levels.

At the National Institutes of Health (NIH), the National Heart, Lung and Blood Institute's National Cholesterol Education Panel recently revised its guidelines for screening individuals; these new guidelines, referred to as "NCEP-ATP III," recommend that women with few risk factors aim for an LDL cholesterol level below 130 mg/dl and an HDL cholesterol level above 40 mg/dl (NIH 2001a). However, many experts suggest that women should err on the side of safety by trying to maintain an HDL cholesterol level at or above 50 mg/dl in order to avoid metabolic syndrome, a cluster of risk factors that strongly relate to CVD (La Forge 2002).

Risk Reduction Strategies. Women should be encouraged to have their lipid profile assessed during their annual physical exam. Making lifestyle changes such as stopping smoking and increasing one's physical activity can help improve lipid profiles. So can following a low-fat diet, such as that recommended in the American Heart Association's latest dietary guidelines, outlined on this page. Research has also shown that dietary soy intake may help increase HDL levels in postmenopausal women and therefore provide protection from CVD (Goodman-Gruen & Kritz-Silverstein 2001).

CIGARETTE SMOKING

Smoking is the most preventable risk factor for heart disease. Approximately 1 in 5 CVD deaths is attributed to smoking (AHA 2006). Although smoking rates are declining overall, the decline has been smaller among women, especially younger women (Mosca et al. 1999). (Most fitness professionals are aware that many young women smoke to control their weight.) The good news is that the World Health Organization estimates that a year after quitting, the risk of CVD is reduced by 50 percent; after 15 smoke-free years, the risk is near to that of someone who has never smoked (AHA 2006)!

Risk Reduction Strategies. Helping your clients, friends or family members quit smoking may be the best gift you can give them. The American Lung Association has a wealth of information and can steer you to numerous other online services; visit the association's Web site at www.lungusa.org. For additional information, see "Smoking Cessation Programs" in the February 1997 issue of *IDEA Today*.

HYPERTENSION

An increase in systolic blood pressure is common in women over the age of 65. In fact, approximately 77 percent of women over 75 years of age are hypertensive (Tsang et al. 2000). Hypertension increases the risk of CVD by 20 to 30 percent.

Risk Reduction Strategies. Research has shown that exercise training is effective in managing high blood pressure (La Forge 2002). The people who are most responsive to exercise therapy for hypertension are those classified as having high-normal blood pressure (130-139 millimeters of mercury [mm Hg] systolic *or* 85-89 mm Hg diastolic) or stage 1 hypertension (140-159 mm Hg systolic *or* 90-99 mm Hg diastolic). Experts recommend moderate physical activity, such as 30 minutes of walking most days of the week, for these types of clients (La Forge 2002).

Another way to counter hypertension is through diet. People who have followed the "Dietary Approaches to Stop Hypertension (DASH)" diet have met with great success in modifying blood pressure through dietary changes (NIH 2001b). The diet consists of an eating plan low in total fat, saturated fat and cholesterol, and rich in fruits, vegetables and low-fat dairy products. For more information, sample menus, charts and food record forms, visit the National Heart, Lung and Blood Institute's Web site at http://rover2.nhlbi.nih.gov/health/public/heart/hbp/dash/.

STRESS

Over time, the image of a middle-aged businessman overwhelmed by job stress and clutching his chest has come to personify the typical heart attack victim. And research studies have focused their attention on exactly this sort of man in the gray flannel suit. For numerous reasons, studies examining women in the boardroom have been few and far between.

Although the AHA does not currently document stress as a risk factor for CVD, the link between stress and heart disease is now beginning to be understood. Psychological stress is showing itself to be a factor in CVD for women as well as men. Researchers who studied women with coronary heart disease found that certain psychological issues can indeed increase CVD risk (Brezinka & Kittel 1995). Women are especially likely to face some of these psychological issues, such as low social class; low educational attainment; the juggling of work and family; chronic troubling emotions; and lack of social support. Studies have also shown that, as men and women age, they experience greater stress-induced changes in systolic blood pressure due to changes in cardiac output and total peripheral resistance (Uchino et al. 1999). This response to stress may increasingly contribute to CVD risk as women age.

How women manage or express anger can also increase CVD risk. Being prone to anger, independent of other risk factors, has been associated with an increased risk for CVD in middle-aged men and women (Williams et al. 2000).

Risk Reduction Strategies. Exercise and positive lifestyle activities can help stressed-out women "chill out." Yet managing stress is easier said than done for most of your multitasking, multichallenged female clients. In her book *Women Are Not Small Men: Life-Saving Strategies for Preventing and Healing Heart Disease in Women* (Goldberg 2002), Nieca Goldberg, MD, outlines practical ways women can learn to manage their anger and stress.

Differences in Heart Attack Signs & Symptoms Between Women & Men

Although both women and men often exhibit the same signs and symptoms while having a heart attack, certain differences should be noted. Seek emergency medical assistance by dialing 911 if you observe any of the following signs and symptoms in your clients:

Classic Signs and Symptoms for Men and Women

- uncomfortable pressure, fullness, squeezing or pain in the center of the chest that lasts more than a few minutes and/or is recurring
- pain that spreads to the shoulder, neck or arm
- chest discomfort accompanied by lightheadedness, fainting, sweating, nausea or shortness of breath

Signs and Symptoms That May Be Unique to Women

- atypical chest pain, stomach or abdominal pain
- recent, unusual shortness of breath during activities or rest
- nausea or dizziness, *without* chest pain
- unexplained anxiety, weakness or fatigue
- feelings of impending doom
- back pain
- palpitations, cold sweat or paleness
- upper abdominal pressure or discomfort

Source: Adapted from http://women.americanheart.org and Women Are Not Small Men: Life-Saving Strategies for Preventing and Healing Heart Disease in Women *(Goldberg 2002).*

HRT to Heart

As women age, their risk for heart disease increases exponentially. The protective benefits of youth appear to result largely from a consistent, ample supply of the hormone estrogen (Contreras & Parra 2000). Estrogen may shield the heart against disease by having a positive effect on lipoproteins, blood clotting, carbohydrate metabolism and vessel wall tone/reactivity (Contreras & Parra 2000).

Because of estrogen's benefits, the use of hormone replacement therapy (HRT) has been investigated as a means to protect the heart after menopause. Unfortunately, the scientific literature on HRT has resulted in much confusion among women and their physicians. Research on this subject throughout the past decade has reminded us that science is a process, not an end point, and that hormone replacement may not be a perfect substitution for the real thing.

The venerated, large-scale women's studies in HRT and CVD investigation are the Heart and Estrogen/progestin Replacement Study (HERS) and the Women's Health Initiative (WHI). Lam et al. reviewed the two in efforts to answer the question—where are we with postmenopausal hormone therapy in 2005? Until the results of HERS were published in 1998, HRT appeared promising in the fight against CVD in women (Hulley et al. 1998). Earlier observational studies had reported lower rates of CVD in women taking HRT. However, the HERS findings showed no reductions in overall coronary heart disease (CHD) events in postmenopausal women with known coronary artery disease who took HRT (Hulley et al.1998). Later results gleaned from the HERS group also showed no decrease in peripheral arterial disease in women with coronary heart disease (Hsia 2000).

Unlike HERS, WHI sought to assess the major health benefits and risks of HRT in women without known CHD (Lam 2005). Women were treated with: a placebo or continuous-combined HRT for those with a uterus, and estrogen-only for women without a uterus. The continuous-combined HRT groups showed a significantly higher rate of CHD events, stroke and venous thromboembolism than the placebo—leading to its termination of use prior to the study end. The estrogen-only group persevered for two additional years until its termination in February 2004 because its risks were outweighing the benefits. CVD events were increased with the estrogen-only group, just as they'd been with the continuous-combined protocol. Lam et al. note that the HRT medications, raloxifene and tibolone, have not been associated with the same CVD risk as the prescription used in HERS and WHI. Results are pending as the research community awaits the news from the Raloxifene Use for the Heart Study (RUTH) of 10,000 postmenopausal women.

Although many greeted this news with disappointment, it should be emphasized that the HERS study involved women with *known cardiovascular disease.* The jury is still deliberating on whether HRT poses benefits or risks to women who do *not* have CVD. Furthermore, investigations using other estrogen formulations are needed.

To add to the confusion surrounding HRT, and contrary to the findings of WHI, the *Journal of Women's Health* reported a review of data from the Nurses' Health Study used to determine if age or HRT initiation plays a role in CHD risk (Grodstein, et al. 2006). The statistical analysis revealed that individuals beginning HRT near menopause had a reduced risk of CHD, and a link between HRT and CHD was not detected for those starting treatment 10 years post-menopause. These results just hit the news stands, so further investigation is justified, but it suggests that timing of HRT initiation may affect the risk for CHD (Grodstein, et al. 2006).

The American Heart Association stands by its advice that each woman should evaluate the pros and cons of HRT with her doctor based on her personal situation, and that a prescription should not be made for the sole intent of lowering CHD events.

These strategies include

- thinking rationally about a situation
- increasing physical activity
- finding a support system
- learning to relax
- improving sleep habits
- searching for the humor in life

EXCESS WEIGHT

Excess weight is an independent risk factor for CVD in both men and women. The Nurses' Health Study revealed a strong, positive association between obesity and CVD risk for the women studied (Tsang et al. 2000). Unfortunately, the percentage of women in the United States who are overweight is increasing at an alarming rate. Approximately 46 percent of Caucasian women, 67 percent of African-American women and 68 percent of Hispanic women are now considered overweight (i.e., BMI > 25 kg/m^2 [kilograms of body weight divided by height in meters squared]) (Tsang et al. 2000).

Risk Reduction Strategies. Weight management can be a challenge for many women. However, weight loss is essential in preventing CVD for two reasons: first, losing weight can help reduce the risk factor of obesity; second—and just as important—it can minimize other CVD risk factors, such as hypertension, high cholesterol, insulin insensitivity and the development and progression of atherosclerosis (Tsang et al. 2000). Exercise is a vital component in any attempt at weight reduction, since HDL levels can plummet if diet alone is restricted. Successful weight management includes behavior modification, lifestyle changes, a reduced-calorie and reduced-fat diet, regular and consistent exercise, and unflagging support (Guare & Schulze 2001).

Take This to Heart

When discussing CVD risk factors with your clients, perhaps the most important thing you can do is *emphasize the power of prevention.* Women can and should become educated and proactive about what they can do to reduce their risk for cardiovascular disease. Start today by encouraging your clients to take charge of their heart health through the following actions:

Get the Numbers. Take a few minutes

out of the day, after an overnight fast, to get a full lipid profile. For a bit of blood and a Band-Aid, a cholesterol screening can help save your heart.

Get Moving. Initiate a reasonable, realistic, enjoyable exercise program. Get the blood pumping with a speed walk or put air in those bicycle tires. Group fitness classes can provide modifiable workouts, variety and even friendships.

Reach for the Fruits and Vegetables. Pass on the processed snacks and grab that juicy, nutrient-packed produce.

Don't Get Saturated. Avoid foods high in saturated fat, such as fatty meats, full-fat dairy, certain processed baked goods and all fried foods.

Work Toward Weight Loss. Find a program, a friend or a cookbook for the lighthearted. Or just modify your current diet.

Extinguish the Urge to Smoke. Join a smoking cessation program offered through a local organization, an employee health promotion program or a wellness center. Don't go it alone—ask for assistance.

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Helpful Heart Resources

The American Heart Association for Women,
http://women.americanheart.org/

The National Heart, Lung and Blood Institute,
http://rover2.nhlbi.nih.gov/

The National Coalition for Women With Heart Disease,
www.womenheart.org/