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Together, heart and vascular disease are the single largest cause of death among women in the United States.
STRAIGHT TALK ABOUT WOMEN’S VASCULAR HEALTH

VASCULAR DISEASE HAS LONG BEEN CONSIDERED A MAN’S DISEASE—THIS IS A MYTH!

Vascular disease is elusive and often difficult to diagnose by symptoms alone, especially in women. This condition affects the circulatory system, which is composed of arteries that take oxygenated blood from the heart to all parts of the body and veins that return the deoxygenated blood back to the heart and lungs. The risk factors for developing vascular disease are very similar to that of developing heart disease; together, heart and vascular disease are the single largest cause of death among women in the United States.

So why is vascular disease so difficult to detect in women? Mostly, because female hormones such as estrogen seem to have a protective role, and it isn’t until after menopause that women’s vascular and cardiac risks begin to escalate, often accelerating at a faster pace than men’s. Unfortunately, vascular disease awareness is lacking among healthcare providers and the public. This missing knowledge leads to a perfect storm of delayed diagnoses resulting in patients often presenting with more progressive stages of vascular disease, which are well beyond the reach of preventive measures. Today, vascular disease has become one of the fastest-growing healthcare crises in the United States. If left undiagnosed, vascular disease can lead to severe disability including heart attack, stroke, kidney failure, pulmonary embolism, and death.

I am excited to have input from nationally renowned faculty members for this issue of V-Aware. The initial discussion will begin with Dr. Peter Cospito, who writes about women’s cardiac health and the factors women have for increased risk of heart disease, especially after menopause. Registered dietician Linda Antinoro outlines effective nutrition and exercise approaches women can take to help lower their vascular risk. Dr. Donna Mendes covers peripheral artery disease, how women’s symptoms may present differently from men’s, and what to do to prevent the progression of this condition. Dr. Kathleen Ozsvath discusses how pregnancy and birth control, unique issues for women, each affect the vascular system. Dr. Stephanie Saltzberg explains chronic venous insufficiency, which is one of the leading causes of disability and healthcare expenditures in the United States. Dr. Gary Siskin writes about treatment for uterine fibroids, which are very common benign tumors of the uterus and occur in 20% to 25% of all women of reproductive age. In this issue, you will also read about Christy, a nurse who developed deep vein thrombosis, and how her symptoms and treatment have changed the way she cares for her patients. Anita Suchdeve, RN, outlines important differences in clinical research between men and women. Lastly, Benita Zahn shares her thoughts on the fact that vascular disease isn’t unique to men.

I hope you enjoy this issue of V-Aware. Previous issues can be found on our Web site, www.vaware.org. As always, we look forward to your comments and suggestions. Feel free to write to us at info@vaware.org.

Warmest regards,

Manish Mehta, MD, MPH
President and CEO of the Center for Vascular Awareness, Inc., in Albany, NY
Heart disease is the leading cause of death and disability for women in every major developed country. Cardiovascular disease (CVD) includes coronary heart disease, stroke, and peripheral vascular disease.

CVD ranks first among all disease categories in hospital discharges for women. It is estimated that between the ages of 45 to 64, one in nine women will develop symptoms of some form of cardiovascular disease. After age 65, that ratio climbs to one in three women. In 2007, CVD caused roughly one death per minute among women in the United States. More women’s lives were claimed by cardiovascular disease than cancer, Alzheimer disease, lower respiratory disease, and accidents combined.

IT’S WORSE FOR WOMEN

Women have unique risk factors for stroke such as pregnancy and hormone therapy. Women also have a higher likelihood of developing high blood pressure (hypertension) in older age, which is a major risk factor for stroke. Each year, 55,000 more women than men have a stroke, and more women than men die from stroke. Obesity has become an epidemic. Nearly two of every three women in the US over 20 years of age are considered overweight or obese. This rise in obesity goes hand in hand with the rise in type 2 diabetes mellitus now seen in more than 12 million women in the United States. Type 2 diabetes appears to be an even stronger contributing risk factor for heart disease in women than in men.

In general, due to the protective effect of estrogen, women develop CVD 10 years later than men. As a result of women being older when they initially present with CVD, they are more likely to have coexisting conditions such as diabetes and hypertension. In fact, after 65 years of age, a higher percentage of women than men have hypertension. In addition, CVD is a particularly devastating problem among minorities. Women of Hispanic descent have a higher prevalence of diabetes, and black women have a higher prevalence of hypertension. The highest coronary heart death rates and the highest overall CVD morbidity and mortality rates are seen in African American women.

AWARENESS STILL LACKING

Despite these sobering statistics, the long-held belief that heart disease is a “man’s disease” remains a myth that is slow to die. According to a survey conducted in 2003, only 13% of women in America believed that heart disease and stroke were their greatest health threat. Another survey conducted more recently by the American Heart Association found that only 53% of women would call 911 if they thought they were having a heart attack. Several studies have shown that women are as likely as men to not follow any prescribed medical therapies.
The diagnosis of heart disease poses a greater challenge in women than in men. For example, women are more likely to describe heart pain as sharp and burning rather than pressure-like. This description of chest pain is rather atypical, and therefore, in an ER setting, would not only be treated less urgently but perhaps lead to a misdiagnosis. In one study, even in the setting of heart attack, 43% of women had no chest pain but instead had shortness of breath, fatigue, or weakness as their complaint. Results of stress testing in women are more often falsely abnormal than in men. Compounding the difficulty in diagnosing heart disease in women, most data suggest that women are not referred as often as men for appropriate diagnostic and or therapeutic procedures.

Outcomes data suggest that women have a higher in-hospital as well as posthospital death rate following heart attack. Women tend to have as favorable a response from “clot-busting” medicines for heart attack as do men and also benefit equally well from angioplasty (balloons or stents) after presenting with a heart attack. Women with coronary heart disease are more likely to develop heart failure than men but have a lower risk for sudden cardiac death than men. Women tend to have a higher 30-day mortality rate following bypass surgery than men, but their long-term survival after bypass surgery is comparable to, or better than, that for men.

**TREATMENT AND PREVENTION FACTS**

Some interesting facts regarding treatment and prevention strategies should be emphasized. Menopausal therapy with hormone replacement should not be used to prevent CVD nor should it be used in women with established CVD. New research from Harvard suggests that, in general, women who suffer from hot flashes and night sweats may actually be at lower risk for CVD when they occur early in menopause. However, onset of these symptoms many years after the start of menopause may be associated with an increased risk for heart disease. Antioxidant vitamin supplements such as vitamin C, E, and beta-carotene should not be used for the primary or secondary prevention of CVD. Folic acid, with or without B6 and B12 supplementation should not be used for the primary or secondary prevention of CVD. Routine use of aspirin in healthy women older than 65 years of age is not recommended to prevent heart attack. Certain statin drugs work better in women than in men in terms of preventing coronary events. Low blood levels of good (HDL) cholesterol appear to be a stronger predictor of heart disease death in women than in men in the over-65 age group. Elevated triglycerides (another type of fat) may be of particular importance in terms of risk, in women, and in the elderly.

**WOMEN, BE PROACTIVE**

Women are not immune to heart and vascular disease. They present with fewer symptoms, testing may be difficult to decipher, and their outcomes may be worse than their male counterparts due to more advanced age and coexisting conditions at the time of diagnosis. Fortunately, lifestyle modifications such as regular exercise, smoking cessation, and weight loss are as beneficial in women as they are in men. Standard therapies for elevated cholesterol, tight control of diabetes and treatment of hypertension are clearly indicated. Women need to take a proactive role in determining their individual cardiac risk and need to avoid ignoring unusual symptoms, especially if they have CVD risk factors including hypertension, obesity, tobacco use, elevated cholesterol levels, diabetes, postmenopausal status, strong family history of cardiovascular disease, or documented stroke, heart attack, or peripheral vascular disease.

The American Heart Association and the American College of Cardiology continue concerted efforts to educate patients as well as healthcare professionals on the subject of women’s heart health. As a result, the rate of public awareness of CVD as the leading cause of death among women in the US has increased from 30% in 1997 to 54% in 2009. The age-adjusted death rate from CVD in females in 2007 was one-third of what it was in 1980. These favorable trends need to continue.

**Ask Your Doctor**

1. Am I at a healthy weight?
2. What would you estimate my cardiovascular risk to be?
3. Should I be on any medicines to modify my risk?
Getting “V-Healthy”
THROUGH DIET AND EXERCISE

Taking steps to lower risk for vascular diseases is crucial for individuals of all ages. Fortunately, the dynamic duo of eating healthfully and exercising regularly may play pivotal roles in slowing down or even preventing vascular troubles from developing in the first place.

The recent release of the 7th edition of the federal government’s *Dietary Guidelines for Americans* places a greater emphasis on reducing excess calorie consumption and increasing physical activity. The recommendations encourage us all to eat more healthy foods such as vegetables, fruits, whole grains, fat-free and low-fat dairy products, and seafood, and to cut back on sodium, saturated and trans fats, added sugars, and refined grains. This approach is right in sync with habits that may offer the most protection, beyond not smoking, for optimal vascular health. This article focuses on the diet and physical activity habits that may protect against vascular disease.

FINE-TUNE FAT INTAKE
Saturated and trans fats generally create havoc on blood vessels. They typically do so by either lowering endothelial function (an indicator of the health of blood vessel linings) or contributing to atherosclerosis (clogged arteries). Strategies for lowering dietary fat include eating fewer red and processed meats, full-fat dairy products, fried foods, and desserts and snacks made with hydrogenated oils.

Unsaturated fats like polyunsaturated, monounsaturated, and omega-3 fats actually seem to provide protection to arteries by improving endothelial function, reducing clotting, or lowering blood cholesterol and triglyceride levels. You can increase your intake of these fats by eating nuts or nut butters, avocados, vegetable oils, and seafood. Fish oil, in particular, has been shown to keep the vascular system running in tip-top shape. Begin, however, with eating fatty fish like salmon, sardines, herring, and canned tuna ideally twice per week. If you are allergic to fish or just can’t meet that weekly goal, ask your doctor if it is safe for you to take a fish oil supplement. Look for a brand that contains a combined total of 500 to 1,000 milligrams of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).
PROTECT WITH PRODUCE
Scores of studies show the more fruits and vegetables you eat, the less your likelihood of developing vascular problems. In one study, researchers randomly assigned 117 women and men to consume one, three, or six servings of fruits and vegetables daily for eight weeks. After two months, the participants who ate the higher number of fruits and vegetables had the best endothelial function. For each additional serving of fruits and vegetables per day, there was a six percent improvement in endothelial function.

Why produce protects the vascular system is unclear. Fruits and vegetables are rich sources of vitamin C and potassium, two nutrients that are especially associated with improved endothelial function. Or it may be that a diet rich in produce leaves less room for unhealthy substances. Don’t rely on individual supplements of these nutrients, however, as that has been shown to be ineffective or even harmful. Instead, when choosing or planning meals, aim to load half your plate with fruits and vegetables.

SLASH SODIUM
Limiting excess sodium seems to keep blood vessels healthier. In one study, researchers examined the effects of reducing sodium intake from 3,100 milligrams a day to 1,300 milligrams daily in 12 individuals with high blood pressure (hypertension). They measured artery compliance, which indicates how well the arteries are able to widen and narrow and therefore allow blood to flow through. Carotid artery compliance increased by 27% after one week of sodium restriction and by 46% after two weeks.

The sodium limit just mentioned is close to the latest recommendation set forth in the Dietary Guidelines. All people over the age of 50, all African Americans, and anyone who already has high blood pressure, diabetes, or kidney disease are now urged to keep daily sodium intake to no more than 1,500 milligrams. Everyone else should strive for no more than 2,300 milligrams a day. The best ways to achieve these targets is to eat fewer processed foods such as canned, frozen, or ready-to-eat convenience or fast foods, and to fill your salt shaker with herbs and spices rather than salt of any type. Plus, read the Nutrition Facts labels on food packaging for sodium content and choose items with lower numbers.

ALCOHOL MAY BE AN ALLY
Moderate alcohol use appears to be beneficial for vascular health. It may do so by improving blood flow throughout the body. The benefits extend even to people with existing vascular disease or diabetes. In a study dubbed SMART (the Second Manifestations of Arterial disease study), moderate alcohol consumption was associated with a reduced risk of vascular all-cause death as well as lower risks for events such as coronary heart disease, stroke, and amputations after a 4.7-year follow-up period.
EXERCISE YOUR ARTERIES

Not only does exercise help keep weight in check, it also provides additional perks for blood vessels and seems to keep arteries less stiff. One study, in particular, involving women backs this up. Although arterial stiffness tends to increase with age, this did not happen in the women studied who were physically active or exercising close to 6 hours per week as compared to sedentary women.

Exercise may help by keeping arterial blood pressure from increasing. Or it may increase production of nitric oxide, a substance produced in blood vessel linings, which helps to dilate arteries and prevent fatty deposits from sticking to vessels.

Even if you cannot attain the six hours of exercise per week, you should still aim for 30 minutes or more of moderate-intensity physical activity such as brisk walking on most days of the week. At the very minimum, avoid inactivity. Multiple short spurts of activity during the day still offer benefits.

THE “V-HEALTHY” BOTTOM LINE

Adopting sound eating habits, exercising routinely, not gaining excessive weight or losing unwanted pounds, and not smoking offer the best opportunities for reducing risk for vascular diseases, even if you have a genetic tendency. Because there are no drawbacks to improving your diet and exercise habits, why not get started today?
PERIPHERAL ARTERIAL DISEASE and Women

Heart disease is the number-one killer of women. Unfortunately, the same disease that affects our hearts affects our legs; this is called peripheral arterial disease (PAD).

Just as coronary artery disease means clogged arteries in the heart, PAD refers to clogged arteries in the legs. One in every 20 Americans over the age of 50 has PAD, a serious disease that increases one’s risk for heart attack, stroke, limb amputation, and death. It is important to know that “slowing down” with age is not inevitable, and it may be a sign of PAD.

OLDER WOMEN AT RISK

The risk factors for developing clogged arteries are cigarette smoking, high blood pressure (hypertension), diabetes mellitus, family history, high cholesterol (hypercholesterolemia), and being African American. PAD risk also increases with age; an artery that becomes blocked is generally a vessel that has been around for a long time.

The United States is an increasingly aging country. In 2009, people aged 65 years or older numbered 39.6 million, representing 12.9% of the US population or about one in every eight Americans. By 2030, there will be about 72.1 million older persons, making up 19% of the population. The majority of this elderly population is women, who outnumber men over the age of 75 by a ratio of 3:2 and men over 80 by 2:1. Women in this group who have any of the risk factors just described will find themselves at risk for PAD.

HOW IT HAPPENS

Clogging of the arteries is caused by a buildup of a substance called plaque. When plaque builds up on a tooth, it causes a thickened area that requires scraping away by the dentist or oral hygienist. Plaque in the legs is composed of cholesterol and calcium, and it also causes a thickening, this time of the blood vessel wall. As the vessel becomes thicker, the lumen or tube-like opening in the vessel becomes smaller or even completely blocked. As the opening in the vessel becomes smaller, less oxygenated blood reaches the leg and foot. This causes the patient to have pain in the calves, thighs, or buttocks when walking. The patient may also have foot pain at night, when the foot is elevated, that can disturb sleep. Sores or wounds on the toes, feet, or legs heal slowly, poorly, or not at all. Color changes occur in the skin of the feet, including paleness or blueness. One leg may be cooler compared to the other leg. There may also be poor toenail growth and decreased hair growth on the toes and legs.

The diagnosis of PAD can be easily made by a vascular specialist clinically and by other healthcare providers objectively with a measurement of the ankle-brachial index. This test is simply performed by taking the blood pressure in the arm and in the ankle and comparing the two. The ratio should equal 1.0.

(ARTICLE CONTINUES ON NEXT PAGE)
**WOMEN’S SYMPTOMS**

Some people may not have the classic symptoms. Women in particular are often diagnosed late because their symptoms are atypical. For example, they may have no exertional leg symptoms or they may have only atypical leg symptoms. Women with PAD are able to walk shorter distances than men with PAD, and their maximum treadmill walking distance is less than men with PAD. Many women with PAD may delay seeing a physician and so wind up with emergent hospitalizations. Because of that delay, they stay longer in the hospital and are more likely to be discharged to a skilled nursing facility. African American women undergoing vein bypass surgery experience particularly poor results.

Symptomatic and asymptomatic women with PAD are at increased risk for cardiovascular mortality. *Asymptomatic PAD* is defined as no exertional leg pain with an ankle-brachial index less than .90. Modifiable risk factors that predispose women to PAD include active cigarette smoking, passive smoking, diabetes mellitus, hypertension, and elevated cholesterol levels.

**PAD MANAGEMENT**

The management of PAD includes encouraging smoking women to quit and referring them to a smoking cessation program. Hypertension control should aim for a blood pressure less than 140/90 mm Hg or less than 130/80 mm Hg if the patient has diabetes or renal insufficiency. Patients with diabetes mellitus require treatment and behavior modification to reduce the blood sugar marker HgbA1C to less than seven or as close to six as possible. Treatment with statin drugs is required to reduce the chances of stroke, heart attack, and death in people who have elevated cholesterol levels and PAD. Antiplatelet drugs such as aspirin are extremely important for individuals that have both PAD and evidence of vascular disease in other areas, such as a previous heart attack or stroke; aspirin use can reduce future events. Exercise rehabilitation programs can increase exercise time, and medication can be added to prolong walking distance beyond that noted with the pain of intermittent claudication.

PAD management calls for behavior modification, medical therapy as prescribed by your primary care physician and vascular specialist, and exercise regimens to improve your ability to function. Endovascular therapy (“minimally invasive treatment”) or open surgery may be necessary. The is all true for both men and women, but just as we formerly thought that heart disease only affected men, we now know that PAD may present differently in women. Women have smaller vessels than men, and we must be aware that slowing down is not inevitable—it is a symptom of something to see a doctor about. Because there will be more women than men in our aging population, helping women to remain independent and functional is paramount.

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**Ask Your Doctor**

1. What are my risks for PAD?
2. Should I be tested for PAD?
3. What can I do to reduce my risk for PAD?
Family planning and pregnancy are often focal points of the human experience. Related issues, ranging from teenage and unwanted pregnancies to family planning and fertility concerns in older mothers, remain in the forefront of healthcare and medical research, legislation, and ever-changing social expectations and constraints.

The National Vital Statistics Reports from the Centers for Disease Control and Prevention have indicated approximately 4 million births in the United States in 2008 and the same in 2009. The Reports noted a steady decline in the number of births to teenage mothers since the early 1990s, while the birth rates in women 40 to 44 years of age have been rising. This increased number of pregnancies in older mothers is likely due to a concentration on career growth and marriages occurring later in life. As fertility treatments become more widespread, we will probably continue to see a rise in pregnancies in this age group.

In December 2009, President Obama signed into law the Teen Pregnancy Prevention Initiative. This initiative has replaced the abstinence-only programs, allowing for open discussion of contraceptive use. Over the past 50 years, the development and use of oral contraception (OC) has proven it to be an excellent, inexpensive, and relatively safe way to help women control their fertility and curtail population growth. However, OC is not without risk.

THE PILL PROBLEM
Deep venous thrombosis (DVT) and pulmonary embolism (PE) can lead to long-term consequences, such as postphlebitic syndromes, chronic limb swelling and pain, venous ulcerations and gangrene, pulmonary hypertension, decreased pulmonary reserve, and death. The use of OC pills increases the risk for all of these complications. So-called birth control pills are made of a combination of estrogen and progestin and inhibit fertility in women. Women who take the second-generation pills that have an estrogen content of less than 50 mcg have a risk of thrombosis that is three times higher than those women not on OC. Women taking pills containing third-generation progestogens increase their risk of thrombosis five times over those not on OC. Additionally, other factors that increase the risk of thrombosis include advanced age, smoking, and a family history of thrombosis. Women who should not take OC include those over the age of 40 who smoke, patients with known familial clotting (hypercoagulable) conditions, severely obese women, and women with known cardiovascular disease or high cholesterol. These conditions increase the risk of blood clots (thrombosis) and death.

HISTORY IS KEY
Conditions that increase a woman’s risk of thrombosis are relatively rare; therefore, widespread testing has not been advocated. Close attention to any personal or family history of venous thrombosis can help identify patients who are at risk and who may benefit from further testing. Hereditary hypercoagulable states that increase the risk of thrombosis include Factor V Leiden (3%-7% incidence), prothrombin 20210A (1%-3% incidence), Protein C or S deficiency (0.01%-1% incidence), and antithrombin III (0.02%-0.04% incidence). Twenty percent of women with antiphospholipid syndrome have had venous thrombosis, and 7% have had a stroke during their lifetime. Of those women that present with thrombosis and stroke, 25% of the occurrences are during pregnancy or postpartum.

Other risk factors for the development of thrombosis include elevated homocysteine levels, increased type 1 plasminogen activator inhibitor, and the presence of D-dimer in the blood. Women with these conditions should consult their physicians regarding contraception use and should also be advised about their risk prior to pregnancy, as well as during and after pregnancy.

(ARTICLE CONTINUES ON NEXT PAGE)
DVT
Pregnancy increases the risk of DVT; its incidence is one in 1,000 to 2,000 pregnancies. DVT usually involves the leg veins resulting in venous hypertension, leg swelling, postphlebitic complications, pain, and PE. Other risk factors that increase the risk of DVT during pregnancy include multiparity (risk increases after the fourth pregnancy), obesity, immobility, advanced age, Caucasian race, dehydration, and previous history of thrombosis.

Diagnosis of DVT is made with ultrasonography. If a PE is suspected, then a ventilation perfusion scan or spiral computed tomography scan is undertaken. If the test is positive for PE, the patient is treated with graded compression stockings and low-molecular-weight heparin until the baby is delivered; after childbirth, warfarin is instituted and continued as long as indicated postpartum. Sometimes a vena cava filter is placed to decrease the risk of recurrent, potentially fatal PE. This can generally be performed safely to protect the mother’s life.

CEREBRAL VENOUS THROMBOSIS
Another thrombotic condition associated with pregnancy includes cerebral venous thrombosis. This condition should be suspected in patients presenting with neurological symptoms occurring during pregnancy and up to three weeks after delivery. Although the pathogenesis is not understood completely, dehydration, hypercoagulable disorders, and anemia have been thought to play a role in this disease process. Cerebral venous thrombosis is treated with anticoagulation medications.

BLOOD PRESSURE MATTERS
The control of blood pressure (hypertension) during pregnancy and during the postpartum period is vital. Pre-eclampsia and eclampsia cause hypertension. Vasospasm of the arterioles leads to organ system failure and can be life threatening to both mother and fetus. Studies suggest that a woman with a history of hypertension during pregnancy carries an increased risk of cardiovascular disease later in her life.

MIND MOM’S HEALTH
The mother’s health is of utmost importance in family planning and pregnancy. A patient’s understanding the risks of birth control pills is essential. Venous thrombosis is generally rare but can be fatal; both the use of OC and pregnancy increase the risk of thrombosis. Awareness, detection, and immediate treatment of thrombosis can minimize morbidity and mortality for the mother and the fetus. Other less common, but serious complications affecting the arterial circulation exist as well. Pregnancy-induced hypertension can also be a marker for cardiovascular disease in the future. All women at risk for vascular issues during family planning or pregnancy should be given special attention by a vascular specialist.

Ask Your Doctor
1. Is OC an option for me?
2. Which OC is the safest choice for me?
3. Am I at any special risk of DVT during pregnancy?
CHRONIC VENOUS INSUFFICIENCY
in Women

Chronic venous insufficiency (CVI) is a condition in which the circulation of blood in the leg veins is impaired. It is a widely prevalent chronic disease that predominantly affects women.

One out of three adult women has varicose veins, which are a sign of possible CVI, and more than 50% of women will develop CVI over their lifetime. Unfortunately, CVI is one of the leading causes of disability and healthcare expenditures in the United States.

CAUSES
CVI occurs when the leg veins are unable to return oxygen-poor blood to the heart for re-oxygenation. To move blood back up to the heart against gravity, the leg muscles squeeze the veins, and one-way valves prevent the blood from flowing backward. CVI is the result of increased vein pressure due to damaged venous valves (known as reflux or incompetence) or vein blockage (obstruction). Rarely, there can be a congenital absence of venous valves.

Valve dysfunction results from weakness of the vein wall preventing valves from closing completely. Prolonged sitting or standing, trauma, blood clots, hormonal fluctuations such as pregnancy, and obesity can result in weak or “leaky” valves. Venous obstruction such as blood clots or strictures can limit blood return to the heart. For example, deep venous thrombosis is a blood clot in a deep vein that obstructs blood flow resulting in valve damage and incompetent veins. The clot can also dislodge and travel to the lungs causing a pulmonary embolism, which can be fatal. Intrinsic stenoses or external compression of the veins can also limit blood flow. For example, in individuals with May-Thurner syndrome, the left iliac vein is compressed by the right iliac artery, which can result in poor flow through the vein and impaired circulation. Regardless of the exact cause, CVI is the result of high pressure in the lower extremity veins, which can lead to a variety of health problems.

SIGNS AND SYMPTOMS
CVI is a progressive condition. Over time, increased venous blood pressure in the legs will continue to damage valves and weaken vein walls, making the problem worse. If untreated, CVI can advance from asymptomatic, unsightly varicose veins to significant discomfort, skin changes, and even ulcerations. Signs of CVI include varicose veins, swelling of the lower extremities, skin discoloration, eczema, thickened skin, bleeding veins, inflamed veins (phlebitis), and ulcers. Symptoms in the legs can include aching, tiredness, heaviness, fatigue, throbbing, burning, itching, and muscle cramping.

RISK FACTORS
There are many things that increase your risk for developing CVI; some of these risk factors are more modifiable than others.

- Female gender
- Obesity
- Pregnancy
- Prolonged sitting or standing
- Family history of venous disorders
- Smoking
- Trauma
- Blood clots

Visible signs of CVI can include skin discoloration, eczema, thickened skin, and ulcers
(continued from previous page)

**DIAGNOSIS**
After taking a complete history and physical examination of the patient, the physician will usually order a venous duplex ultrasound of the lower extremities. This is a safe, painless, and noninvasive method for evaluating venous disease. Sound waves measure the speed of blood flow, rule out blood clots, and assess valve competence. To check the veins in the abdomen or pelvis for central venous obstruction, noninvasive computed tomography or magnetic resonance venogram might be used on a case-by-case basis. Lastly, conventional venography, an invasive procedure involving the injection of contrast dye under x-ray, can be used for diagnostic and therapeutic purposes. This imaging technique is used particularly in patients that may benefit from a minimally invasive treatment performed via a needle puncture (percutaneously) such as venoplasty and/or stenting.

**TREATMENT**
Treatment for CVI is primarily focused on reducing venous reflux. First-line therapy involves medical-grade compression socks that aid in reducing venous pressure by squeezing the veins to reduce swelling. Lifestyle modifications that can help include leg elevation, avoiding prolonged sitting and standing, exercise, and maintaining an ideal body weight.

Many patients experience incomplete relief with conservative treatment. There are minimally invasive office-based procedures with low complication rates and fast recovery to treat CVI. These include sclerotherapy, stab phlebectomy, endovenous vein ablation, venoplasty/stenting, and thrombolysis/thrombectomy.

Generally, refluxing superficial veins can be removed or closed off with sclerotherapy, stab phlebectomy, or endovenous ablation. Deep vein reflux is more severe and debilitating, as these veins cannot be removed. Procedures such as venous bypass and venous valve surgery are complicated and can have suboptimal outcomes. In the last several years, more attention has been focused on the minimally invasive treatment of obstructive deep vein lesions, which are common in CVI patients with severe symptoms.

**Here are the most common treatments for chronic venous insufficiency:**

- **Sclerotherapy** involves injecting a solution into the diseased vein causing it to scar and close. This treatment can be used for small veins and limited areas of reflux.

- **Stab phlebectomy** is the direct removal of varicose veins through tiny incisions under local anesthesia in the office.

- **Endovenous vein ablation** uses heat energy from a laser or radiofrequency catheter placed percutaneously to close larger veins with significant reflux. This procedure is performed in the doctor’s office with local anesthesia.

- **Balloon venoplasty/stenting** is a percutaneous, catheter-based intervention to treat focal narrowings in veins. This treatment is commonly used in obstructive deep vein lesions such as found in patients with May-Thurner syndrome.

- **Thrombolysis/mechanical or catheter-aspiration thrombectomy** are percutaneous catheter-based interventions used to disrupt thrombus (such as iliofemoral deep vein thrombosis) and restore venous outflow. These approaches can alleviate symptoms and reduce long-term consequences of blood clots.

**SEEK THE RIGHT TREATMENT**
CVI is a condition that most commonly affects women. Treatments continue to evolve to address both short-term and long-term consequences of this disease. For optimal outcomes, seek out the care of a vascular physician who can offer the full spectrum of therapeutic options and a multidisciplinary approach.

**Ask Your Doctor**
1. Are my varicose veins a sign of CVI?
2. How can I reduce my risk for developing CVI?
3. What is the best treatment for me?
Managing UTERINE FIBROIDS

Uterine fibroids are very common benign tumors of the uterus. They occur in 20% to 25% of all women of reproductive age, with rates higher in African American women compared to Caucasian women.

Most women with fibroids are diagnosed in their 30s and 40s either when their symptoms begin or when fibroids are found incidentally during a routine pelvic exam. The symptoms associated with uterine fibroids include abnormal bleeding (heavier and longer periods) and bulk-related symptoms including pelvic pain, menstrual cramping, abdominal distension, increased frequency of urination, and pain during intercourse. Amongst women experiencing fertility problems, fibroids are thought to be the cause of infertility in less than 1% to 3% of women. The incidence of malignant fibroids (leiomyosarcomas) is estimated to be less than 1% in premenopausal patients.

MEDICAL AND SURGICAL TREATMENTS

Conventional treatment of symptomatic fibroids involves either medical or surgical therapy. Oral contraceptives are often used initially to control fibroid-related symptoms. Ultimately, many patients with symptomatic fibroids undergo surgery for treatment. Hysterectomy, the complete removal of the uterus, has traditionally been the surgical option offered to women with symptomatic fibroids. Myomectomy, which involves the individual removal of fibroids from the uterus, is an alternative to hysterectomy. In general, myomectomy is performed when preservation of fertility is desired or if the patient wants to retain her uterus. The success of a myomectomy in controlling symptoms is approximately 80%, but the recurrence rate for fibroids can be as high as 30%.

UTERINE ARTERY EMBOLIZATION

Uterine artery embolization (UAE) is an endovascular treatment option for women with symptomatic fibroids. The procedure was first described in the mid-1990s and utilizes small particles injected into the arteries that provide blood flow to the fibroids, causing the fibroids to shrink. Since that time, UAE has enjoyed growing acceptance as an alternative treatment for fibroids and has likely played a significant role in decreasing the hysterectomy rate in these patients. Most patients with symptomatic fibroids are considered candidates for UAE unless other pathology is found on pelvic magnetic resonance imaging testing that can explain the patient’s symptoms. This approach is different from those in the past. Instead of removing the entire uterus or only the fibroids, and instead of hormonally manipulating the fibroids with medication, embolization interferes with the arterial supply to the fibroids, shrinking them by inducing necrosis and degenerative changes within these tumors, leading to an improvement in symptoms.

(ARTICLE CONTINUES ON NEXT PAGE)
During UAE, arterial access is typically gained via the right common femoral artery. Selective catheterization and angiography of the left common iliac artery is performed to evaluate the left-sided pelvic arterial anatomy and to localize the origin and course of the left uterine artery. A microcatheter is introduced into the left uterine artery, and embolization is performed with a particulate embolic agent (Embosphere Microspheres; Merit Medical Systems, Inc., South Jordan, Utah). This particular agent is used most commonly given its success at improving symptoms, reducing uterine and dominant fibroid volume, and infarcting (blocking blood supply to) fibroids within the uterus at the time of treatment. Once the left uterine artery has been embolized, the procedure is repeated on the right side. An abdominal aortogram is then performed to confirm that both uterine arteries have been embolized. This imaging technique is also helpful to determine if collateral vessels, such as the ovarian arteries, are contributing significantly to the vasculature of the fibroids because these vessels can be embolized if necessary.

RECOVERY FROM UAE
Patients considering this procedure for treatment of fibroids are often concerned about the recovery period afterward. Following UAE, patients typically experience pelvic pain or cramping, nausea and vomiting, low-grade fever, fatigue, and generalized malaise. In most patients, these symptoms last anywhere from three to seven days. Most centers agree that both narcotic pain medication and nonsteroidal, anti-inflammatory medications are needed to address these symptoms; either drug used alone tends to be inadequate for relief. Medication to address nausea is also important to include in a discharge medication regimen as well, as this symptom, attributed to both fibroid infarction and the effects of the narcotic pain medication, can be quite significant in these patients. The symptoms gradually improve over a period of several days with most patients being fully recovered within two weeks. The safety of performing UAE on an outpatient basis has been established, but most centers observe their patients for 24 hours before discharging them home.

UAE SUCCESS RATES
During the past 15 years, a large number of studies describing the clinical success associated with UAE have been published indicating significant improvement in menstrual flow (88%) and bulk-related symptoms (71%). In these studies, the mean dominant fibroid volume decreased between 20% to 60% after UAE. A multicenter registry studying more than 3,000 patients from 72 sites found significant improvement in symptom severity and health-related quality of life 12 months after the procedure. Long-term data have shown that 73% to 90% of patients report symptom control five years after UAE.
Ask Your Doctor

1. I have been diagnosed with uterine fibroids; does it mean that I need treatment?
2. How do the risks of surgery compare with the risks of UAE?
3. Is UAE an option if I want to have children in the future?

UAE COMPLICATIONS

Complications have been reported after UAE. From the fibroid registry data, it is known that the major in-hospital complication rate is 0.66%, and the 30-day major complication rate is 4.8%. The early onset of menopause, possibly caused by inadvertent embolization of the ovarian arteries, is a known complication of UAE, with patients older than 45 years of age at greater risk for this outcome than younger patients. Other complications of UAE include pelvic infection, venous thromboembolic disease (including deep venous thrombosis and pulmonary embolism), passage of fibroid tissue out of the uterus and vagina, complete uterine necrosis, and arterial complications (including hematoma formation, arteriovenous fistula, distal embolization, and contrast reactions) because this is an endovascular procedure.

A SAFE AND EFFECTIVE OPTION

UAE is an exciting advance in the treatment of symptomatic uterine fibroids. In 2008, the American College of Obstetrics and Gynecology gave UAE a Level A rating, stating this is a safe and effective treatment option for fibroids based on good and consistent scientific evidence. As a non-surgical treatment, it has enabled women to have their fibroid-related symptoms addressed using a low-risk, organ-sparing technique that offers the opportunity for patients to quickly return to their work and family lives.
A PATIENT’S STORY: Christy

I always thought of myself as a healthy person. Sure, I had some aches and pains, but that’s to be expected for a 37-year-old nurse who helps lift patients on a daily basis. I did not consider myself a hypochondriac, but since September 2009 some days I questioned it.

Like most women, I started taking birth control in my early teens. It is what women do to be responsible and take charge of our reproductive systems. Over the years, I used a few different types of birth control before switching to a method called a *ring*. I switched because I was experiencing headaches from my previous birth control. It was not until I used the ring method, however, that I suffered a blood clot.

I mentioned earlier the aches and pains I was having; one of those pains was in my lower back for which I was treated with an epidural steroid injection for the pain. The next day, I went out of town for the weekend. That night, I was woken up by an excruciating pain in my left calf. I was able to walk it off to some degree, but the pain was always there.

I am a registered nurse, and at the time, I was working in a critical care unit in a local hospital. I went to work every day for 2 weeks with increasingly severe pain in my left leg that continued to worsen as time passed. As the leg became more and more painful, my coworkers and I started to diagnose me, as most of us nurses do. “It’s just a charley horse, you’ll be fine,” was a common guess early on.

LONG TIME TO WAIT

When the pain didn’t improve, we thought that maybe it was from the injection that I had just a couple of weeks before, so I called the orthopedic office on Friday and got an appointment to be seen on Tuesday. Over the weekend the left calf pain increased in intensity and I was short of breath when walking around or going up stairs. I had to lay low, basically doing nothing because of the severe pain in my calf. This pain was the most severe pain I had ever experienced in my life. I describe it as the worst charley horse in the world magnified by 100% and coupled with an intense burning sensation in my calf.

On Tuesday, I went to the appointment with my orthopedic doctor, and he looked me over. He did not feel that my leg pain was caused by the epidural injection. He suspected from my symptoms that I had a deep vein thrombosis (DVT), a blood clot in the leg. He had never seen an epidural injection cause the complication of DVT. He called a local hospital and scheduled an emergency duplex ultrasound of my left leg.

I was sent from the office to the hospital for a duplex ultrasound of my lower extremities. A blood clot was found in the back of my left knee. When the technician came in with the wheelchair to roll me into the ER, I looked at her like she was crazy because I don’t ride in wheelchairs, I do the driving. She wasn’t going to let me walk, however, so I got in the wheelchair, and off to the ER I went.
“I COULD HAVE DIED”
During the emergency doctor’s interview, she asked me if I was experiencing any shortness of breath or chest pain. I told her, “Now that you mention it, I am having some shortness of breath doing stairs and some chest pain.” When I was having the shortness of breath, I remember thinking to myself, “Boy, I’m out of shape if I can’t do five steps. I need to get back to the gym!” Due to the shortness of breath, a CAT scan of my chest was ordered, which was positive for blood clots in both lungs, pulmonary embolisms. All I could think was, “Wow, I could have died!” I remember hearing that pulmonary embolisms are responsible for over 100,000 deaths in the United States each year!
I don’t consider myself a very lucky person, but lucky I was! I was started on two forms of blood thinner medications and sent home after an overnight stay in the hospital. My calf pain went away within 24 hours after the start of the blood thinners. It took some time for my breathing to get better, however. I don’t think that I have ever gotten back to my baseline lung function. I have to use inhalers during exercise now, which I didn’t use before.
During the next few months, I continued to experience chest pain and was in the ER several times. I started to feel like I was becoming a “frequent flyer” (a term some people in the medical field call patients who keep coming back to the hospital with no real medical problems). First I had a cardiac work-up, next trip I had another CAT scan of the chest to rule out more blood clots in my lungs, and on the third trip, I asked my doctor if he thought my problems could be related to my gallbladder. This question earned me another ultrasound, and my gallbladder was removed in January of 2010.

HEALTHY, YOUNG, AND LUCKY
The only risk factor I had for developing a DVT was being on birth control. I wasn’t overweight. I had never smoked, and I wasn’t a diabetic. I didn’t have high blood pressure. While I was hospitalized, my laboratory results ruled out any clotting disorders. I was a healthy young woman. This experience was very scary. I was on blood thinners for 6 months. I’m not a pill taker, so trying to remember to take a pill every day was a challenge for me. Being on blood thinners as a young, active person affects everything you do in your personal and professional life. It was a big joke in the unit that I work on when my watch would go off at 6:00 PM every day so I wouldn’t forget to take the medication.

After going through something like this as a nurse, I developed a different understanding of my patients’ experiences—from what a DVT feels like to the shortness of breath and the surgical intervention for the gallbladder removal. The pain I felt from that clot in my leg was like no other pain I have ever felt in my life. So if anyone tries to tell you it shouldn’t hurt, they are lying.
What I want people to take away from my story is this: Don’t wait. Seeing a doctor may save your life. I was very lucky.

-by Sharon Cillis, RN
Bridging the Vascular Health Gender Gap

Vascular disease has long been considered to be a man’s disease, when, in reality, vascular disease affects millions of women in the United States.

So why, in this day and age, when most information moves at the speed of lightning, do we remain so ill-informed about vascular health? There are several reasons including that, in the health industry, information and statistics regarding diseases are predominantly obtained through research studies. Much of the information we have today about vascular disease is based on past research studies that focused predominantly on men, leaving women underrepresented. This leads to the important question: If women have not been equally represented in large randomized studies, then do we truly know the effects of vascular disease on women?

Women Are Different

When it comes to vascular health, there are many differences between women and men, primarily the cardiovascular protective effects of estrogen in premenopausal women. Estrogen produced naturally by the ovaries has protective effects against cardiac and vascular disease. This effect would account for the lower incidence of vascular disease in premenopausal women. When women reach menopause, however, the disparity between the two genders becomes smaller and starts to equalize; in some instances, vascular disease is even accelerated in women compared to men of the same age. Right now, the effects of hormone replacement therapy are a controversial issue. Although there are many benefits to hormone replacement therapy, more research is needed to further evaluate the risks it has on vascular disease when used as a form of primary prevention.

Another issue that women face concerns oral contraceptives, which are widely used in our society to prevent pregnancy and control menses and are known to protect against certain cancers such as endometrial and ovarian cancer. Unfortunately, there are side effects to most medicines, and oral contraceptive use increases the risk for heart attack, stroke, and blood clots.

The Vicious Cycle

Even though we know that there are clear differences in clinical and physiologic patterns for women with vascular disease (whether it is cerebrovascular, aortic aneurysms, or peripheral vascular disease), we are caught in a vicious cycle. Healthcare providers practice evidence-based medicine and treat their patients according to the established standards of care that are based on past research. The historical underrepresentation of women in clinical studies...
has in some ways led to a gap in our understanding of the particular risk factors that might affect women differently than men. In addition, because of the innate differences between men and women, symptoms of vascular disease may present differently. As a result, women are under-diagnosed and undertreated due to the lack of data specific to women’s vascular health. The only way to rectify this situation is to conduct research studies that are geared toward diagnosis and treatment of women with vascular disease.

The gender disparity in vascular health care can also be seen in the way we screen men versus women. For example, the screening for abdominal aortic aneurysms (AAA) is completely different between genders. The US Preventative Services Task Force recommends one-time screening for men 65 to 75 years of age who have ever smoked. In contrast, the task force recommends against screening women. This recommendation was based on the “low prevalence of large AAA in women” and the assumption that “the number of related deaths that can be prevented by screening this population is small.” Yet data have shown that women have a higher risk for AAA rupture than men. So why are we not screening women? The vicious cycle begins again.

EXCLUSION PUTS WOMEN AT RISK

The question remains, why have women been underrepresented in past research trials? One fundamental reason is the thought that women are “just like men” and therefore there was no need to include them in studies. The results obtained from research on men could simply be applied to women as well. Also, women were often excluded to protect any potential fetuses, regardless of if the woman was pregnant, intended to become pregnant, or was using some sort of contraceptive to prevent pregnancy. We can argue against these rationales based on what we know today. Not including women of childbearing potential does not in actuality protect them in the long run, but rather exposes them to drugs (when on the market) and therapies that can potentially be inactive, harmful, or inappropriate because they were never tested on them.

QUESTIONS NEED ANSWERS

Women are outliving men. According to the 2008 census, there are twice as many women living past the age of 85 compared to men. As women age, especially during and after menopause, data have indicated that their rate of vascular health disease increases. According to the article “Arterial Vascular Disease in Women,” published in the Journal of Vascular Surgery in October 2007, women with lower extremity arterial disease often seek medical attention when the disease process has become more severe in comparison to men, resulting in worsened outcomes. It is unclear why women are not being treated earlier. Are women able to deal with the pain longer? Are they choosing not to be treated because of sociological issues, such as taking care of spouses and families? There are so many questions that still need to be answered regarding women’s vascular health. More gender-specific research needs to be conducted in order to fully understand how to screen, diagnose, and treat women with vascular disease appropriately.

BREAKING THE CYCLE

As we move forward, we need to break the cycle. Not only do we need more trials geared towards women, we also need more women to volunteer to take part in research. There is currently a large movement to educate women about their health. Thanks to organizations and campaigns such as the American Heart Association Go Red for Women and the Society for Vascular Surgery Women’s Leadership Retreat, we are working toward changing the preconceptions that are out there and, ultimately, improving the quality of life for aging women.
Who says it’s **ONLY A MAN’S DISEASE?**

My friend Debbie is unlucky when it comes to affairs of the heart. For the skinny on the traditional sense of that, you’ll have to ask her for details.

But I can tell you about her other heart trouble, the trouble that earned her a membership in the “mended hearts club.” In 2010, at the age of 56, Debbie underwent a triple bypass.

“I went for a walk, and an elephant fell out of a tree and onto my chest,” is the way Debbie describes the first indication she received that all was not right with her heart. Ironically, she was complying with her doctor’s prescription to add some exercise to her daily routine when she took that fateful walk. As Debbie describes the incident, it was a gorgeous June day with not a cloud in the sky when the horizon darkened on her life. When “the elephant landed,” she stopped her stroll, headed back to the high school where she’s a guidance counselor, and threw herself back into her workload.

The pain subsided, and she pushed it to the back of her mind. The next day, determined to get more use out of the new walking shoes she’d purchased, she laced up again and headed out, only to have the same experience. This time, the pain radiated into her left arm. Again, Debbie brushed it off and went back to work. But by the next day, she convinced herself to call her doctor.

“Oh on some level, I knew it was trouble,” she told me, sitting behind her desk at work. Debbie is an accomplished woman. In addition to her day job, she’s a respected actress and director in local community theaters. At home, she cares for an aging mother. Finding time to take care of herself was a low priority. That was about to change.

“My doctor gave me a stress test, which I promptly failed,” Debbie told me. That got things moving quickly. She was rushed into the catheterization (“cath”) lab, and an angiogram showed three blocked arteries; one was almost totally occluded. Bypass surgery was hastily scheduled.
GETTING TO “AHA”
“When I went in for the surgery,” Debbie recalled, “someone asked if this was the first time.” She throws her head back, and her eyes widen as she laughs, “Who would do this more than once?” But like many people, Debbie might just find herself making a second appointment for surgery. Making the lifestyle changes necessary to keep her heart healthy is tough going.

“Let’s just say I’m not friends with vegetables. French fries and I are on better terms.” She knows she’s got to change that relationship, but old habits die hard. And, despite the surgery, she still hasn’t had that “aha” moment about her health.

Dr. Kim Poli, assistant professor of cardiology at Albany Medical Center, hears this all too often. “Women need more reinforcement on all levels when it comes to their heart health,” she told me. As Poli notes, women are late to the doctor when heart trouble starts, so by the time they are seen, their disease is more extensive. The challenge is convincing women to recognize symptoms that spell trouble. “Exhaustion, shortness of breath, women need to recognize these may mean heart disease,” she points out. But how many need to recognize these may mean heart disease.

“I thought her health problems were only because she smoked,” says Paula. So Paula ignored what she thought was heartburn for about a week until it became debilitating. The pain sent her to the nurse at her place of employment, who took one look at her and knew Paula was in trouble. She had an ashy pallor, and she was sweating and feeling nauseated.

“I remember calling my husband and telling him to come get me and bring me to the hospital,” says Paula. From there, it was all a blur that resulted in seven stents to restore blood flow to her heart. That was in April 2009. Her Christmas gift that year was another four stents.

GET EDUCATED
Part of the problem is that most women, like Debbie and Paula, still don’t recognize their risk. But the numbers don’t lie: More women will die from heart disease than from all cancers combined. Almost every minute of every day, a woman dies from heart disease. In addition to this, the rate of sudden cardiac death of women in their 30s and 40s is increasing faster than that among men of the same age. So what’s the problem?

DENIAL IS NOT A RIVER
If you want to know about being tired, ask 60-year-old Paula. She’s a mother of four and devoted grandmother of seven. She works full time and, like Debbie, performs in local theater productions. In short, she was always on the go and, for a while, never, ever felt fully rested. She was overweight and had developed type 2 diabetes but, as she jokes, thought “denial” was only a river in Egypt. Her denial was about her risk for heart attack, despite the fact that she knew her mother had heart disease.

“They’re just not friends,” she told me. “I thought her health problems were only because she smoked,” says Paula. So Paula ignored what she thought was heartburn for about a week until it became debilitating. The pain sent her to the nurse at her place of employment, who took one look at her and knew Paula was in trouble. She had an ashy pallor, and she was sweating and feeling nauseated.

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In part, the problem is education. Men know they’re at risk for heart disease. Consider the old clichés: the hard-charging, chain-smoking, type A guy, or the fun-loving, eat-anything guy with the big gut, which is a risk factor, is both well-known and well-modeled in the media. How many times have we seen a man suffer a heart attack in the movies or on a TV screen? Countless is the answer. What about women? I did a Google search and found just one reference: the character Dee on the FX television series It’s Always Sunny in Philadelphia. By the way, Dee is a slender, young woman. And yes, women who look like her also suffer heart attacks, which means all women, not only the middle-aged and overweight, need education and counseling about this potential killer.

Debbie felt the “elephant” on her chest; however, research shows most women don’t have that classic symptom. Women tend to have more subtle symptoms of heart attack, making recognition more difficult. It’s about the fatigue, the shortness of breath that has nothing to do with a case of the nerves, that ongoing heartburn, the sense of dread, the neck, arm, or back pain. Just as medicine did for men—driving home the symptoms, encouraging them to be “checked out when in doubt”—the same now must be done for women. This is a preventable disease and death can be cheated, but there needs to be a concerted effort to get women out of the land of denial and doctor, you must make the journey with them.
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