10 for 2010: 10 things you should know about heart disease

Women's unique heart risks are spurring changes in prevention and diagnosis.

Women and men share most risk factors for heart disease—including high cholesterol, inactivity, obesity, high blood pressure, and smoking—but there are some gender differences in its development, symptoms, and prognosis. Compared with men, women have a greater chance of dying from heart disease; they’re twice as likely to have a second heart attack within six years of the first; and they don’t fare as well after bypass surgery or angioplasty. On the other hand, women tend to develop heart disease about 10 years later than men.

What explains these disparities? The later onset of heart disease is probably due in part to the protective effects of ovarian estrogens, which are not lost until menopause. But because women develop heart disease later, they’re more likely to have coexisting conditions, like diabetes, which can complicate treatment and recovery. Women also have smaller hearts and coronary vessels, which can make surgery more difficult. And some standard diagnostic techniques, such as coronary angiography, may be less effective for women.

Angiograms are good at finding cholesterol-laden plaques that bulge inward from vessel walls, forming blockages inside the arteries. That’s how plaque typically forms in men. In women, it tends to grow more uniformly throughout the vessel walls and therefore may be undetectable by an ordinary angiogram. Heart attacks in men are usually caused by plaque rupture, which produces a clot that shuts down blood flow in an artery. Women are more likely to suffer from plaque erosion—they shed smaller pieces of plaque that generate a host of smaller blood clots. Moreover, women are more likely than men to have microvascular disease—narrowing or stiffening of the microscopic tributaries of the coronary arteries. These microvessels, too small to be seen on an angiogram, nourish the heart muscle and keep it healthy. Even when the main coronary arteries remain clear, microvascular disease can restrict the heart’s oxygen supply, producing angina and other symptoms.

There’s a lot more to learn about how women’s hearts differ from men’s, how they age, and how they respond to diet, exercise, stress, and other influences. Research is ongoing—so stay tuned. In the meantime, here are 10 things you should know about women’s heart risks and how best to manage them.

1. **Unfavorable cholesterol.** The cholesterol (blood lipid) risk factors for heart disease are somewhat different in women than in men. A low level of “good” HDL cholesterol (below 50 milligrams per deciliter, or mg/dL) is a greater risk for women than elevated “bad” LDL cholesterol (the biggest lipid-related risk factor for men). High triglycerides (over 150 mg/dL) are also a greater risk factor for women, especially women with a waist measurement of 35 inches or more. Total cholesterol is less important than another number—the total-cholesterol-to-HDL-cholesterol ratio (total cholesterol divided by HDL cholesterol). The optimal ratio for women is less than 3.2. Risk in women is also associated with non-HDL cholesterol (total cholesterol minus HDL), which should be less than 130 mg/dL. **What to do.** Have a fasting lipid profile every five years. If your cholesterol levels need improvement, lifestyle changes come first—exercise, not smoking, weight control, and a nutritious diet that includes plenty of fruits, vegetables, and whole...
Heart disease continued

2 The role of inflammation. Cholesterol is not the only indicator of heart disease risk. Evidence that inflammation plays a role in the formation of artery-clogging atherosclerosis has put a spotlight on C-reactive protein (CRP), a substance the body produces in response to infection and inflammation. Now there’s a test for blood vessel inflammation called high-sensitivity CRP, or hsCRP. The Women’s Health Study found that women with high hsCRP were about twice as likely as those with high LDL cholesterol to die from a heart attack or stroke. And women with normal LDL cholesterol but high hsCRP were at greater risk than those with elevated LDL and low hsCRP. As a result of such findings, the hsCRP test is now often used to estimate the likelihood of a heart attack. What to do. Healthy women with no known risk factors for heart disease don’t need an hsCRP test. Nor do women at high risk who are already being treated. However, if you have normal cholesterol but other risk factors such as high blood pressure or a family history of heart disease, an hsCRP test might serve as a “tiebreaker” to help you decide whether to take a medication. Insurance usually covers the cost.

3 Blood pressure control. In both sexes, high blood pressure, or hypertension, damages the cells lining the coronary vessels and sets the stage for inflammation and plaque development. An optimal level is less than 120/80 millimeters of mercury (mm Hg). Up to age 55 or so, women are less likely to have high blood pressure than men. After that, their blood pressure typically rises more sharply than men’s, and by age 70, about 80% of women have hypertension. What to do. If your blood pressure creeps above the optimal level, try lowering it with lifestyle approaches such as weight loss, increased exercise, moderate alcohol (no more than one drink per day), cutting back on salt, and following a healthy diet. If your blood pressure is 140/90 mm Hg or higher, your clinician may recommend a medication, usually a thiazide diuretic. (For more information, see the August 2009 issue of Harvard Women’s Health Watch, or visit www.health.harvard.edu/womenextra.)

4 The need for exercise. More than 50 years of research has shown that the more physically active you are, the lower your risk of heart disease. In one study of postmenopausal women at risk for cardiovascular disease, those who were fit (able to jog at a rate of 5 mph or perform the equivalent) had a lower rate of heart attacks, strokes, and death—regardless of body weight—that those who were not fit. Exercise promotes many beneficial changes in the heart and the coronary arteries, including increased antioxidant activity and improved function of the endothelium (the cells lining the coronary arteries). It can raise HDL levels and lower triglycerides, changes that are especially important for women. It also helps ease mental stress—a risk factor for high blood pressure and thus heart problems. What to do. Apart from not smoking, exercise is probably the single most important thing you can do to reduce your risk for heart disease. For a list of resources on increasing activity and improving fitness, go to www.health.harvard.edu/womenextra.

5 Differences in symptoms. Both women and men may experience angina, the classic sign of heart disease, which causes chest pain, a cold sweat, nausea, and other symptoms. But women are more likely to report several less dramatic symptoms as well, including general discomfort, exhaustion, or shortness of breath under stress or during daily routines. Women are also more likely to experience Prinzmetal’s angina, which occurs at rest (usually at night) and is caused by a spasm in a coronary artery. In both men and women, chest pain or pressure is often the first sign of a heart attack; arm pain, shoulder pain, and sweating are also common and unisex. But women are more likely to also complain of fatigue, nausea, back pain, dizziness, and palpitations. A recent study found that 84% of women (and 76% of men) experienced prodromal symptoms—
early, heart-related warning symptoms (chest pain, arm and shoulder pain, shortness of breath, and fatigue) in the year before a first heart attack. **What to do.** The lesson here is, if you feel unusually tired, achy, or short of breath, check with your clinician to make sure it isn’t heart disease.

**6 Depression and the heart.** The links between the mind and heart health are hard to quantify, but most health experts agree that psychological factors can contribute to cardiac risk. One of the most significant for women is depression. In the Nurses’ Health study, depression was associated with an increased risk of fatal heart disease, including sudden cardiac death, even after correcting for other risk factors (including high blood pressure, high cholesterol, smoking, obesity, and inadequate exercise). It’s not only that depression promotes heart disease; a heart attack can cause depression, which in turn raises the risk of a second heart attack. One way depression is harmful is that it can discourage a woman from taking care of herself—from exercising, avoiding cigarettes, eating well, and taking medications. Direct biological mechanisms may also be involved, including increases in inflammatory responses and blood clotting. **What to do.** If you’re having a difficult time emotionally, your heart health is among the many reasons to consider seeing a mental health professional. Get a referral from your primary care clinician, or find a therapist through the National Alliance on Mental Illness, www.nami.org, 800-950-6264 (toll-free), or Mental Health America, www.nmha.org. For a list of mental health providers who accept Medicare, go to www.health.harvard.edu/providers.

**7 Sleep and the heart.** Poor sleep is associated with high blood pressure, atherosclerosis, heart failure, heart attack, stroke, diabetes, and obesity. In one study, middle-aged women who got no more than five hours of sleep per night over a 10-year period had a 30% greater risk for heart disease than women who averaged eight hours. Inadequate sleep has also been linked to coronary calcium, a component of atherosclerotic plaque. Another cardiovascular risk is a sleep-disrupting breathing problem called sleep apnea. And blood levels of several inflammatory markers (CRP, interleukin-6, tumor necrosis factor–alpha, and others) increase with poor sleep. **What to do.** Try to get seven to eight hours of sleep a night. If your sleep is chronically disturbed or inadequate or you often feel sleepy during the day, talk to your primary care clinician. Or, you can start here: www.nlm.nih.gov/medlineplus/sleepdisorders.html.

**8 Assessing risk.** For many years, experts have relied on a risk-assessment tool based on data from the Framingham Heart Study that estimates the risk of having a heart attack in the next 10 years by taking into account age, gender, smoking, cholesterol levels, and blood pressure. A new measure known as the Reynolds risk score also takes into account hsCRP and family history and has improved predictive ability, especially for heart attacks in women. In one study, the Reynolds model reclassified into higher or lower risk categories nearly half of the women judged to be at intermediate risk by the Framingham model. **What to do.** To calculate your Framingham risk score, go to www.health.harvard.edu/heartrisk. If your risk is moderate—5% to 20%—consider getting the hsCRP test, then reassessing your situation with the newer Reynolds model, which you can find at www.reynoldsriskscore.org.

**Heart disease prevention targets for women**

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<th>Risk factors</th>
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<td>Lipids, lipoproteins</td>
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<td>Total cholesterol</td>
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<td>HDL cholesterol</td>
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<td>LDL cholesterol</td>
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<td>Triglycerides</td>
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<td>Non-HDL-C (total cholesterol minus HDL)</td>
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<td>Blood pressure</td>
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<td>Body mass index (BMI)</td>
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<td>(measured at navel level)</td>
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<tr>
<td>Alcohol intake</td>
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<td>Exercise (moderate intensity, such as brisk walking)</td>
<td>30 minutes/day**</td>
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<td>Sodium intake</td>
<td>Less than 2.3 g/day (about 1 tsp. salt)</td>
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* If you already have or are at high risk for heart disease, your target numbers may be different.
** Women who need to lose weight or sustain weight loss should aim for 60–90 minutes per day.
Heart disease continued

Aspirin is a question mark for women. A daily aspirin has been shown to reduce the risk of a first heart attack in men, but the Women’s Health Study found more equivocal results for women. Daily aspirin helped prevent ischemic stroke (the most common type), and it was somewhat effective in preventing heart attacks among women ages 65 and over. But for women under age 65, regular aspirin use was no better at preventing heart attacks than taking a placebo. Clearly, aspirin isn’t a miracle worker, and it’s not entirely benign either. Gastrointestinal bleeding and hemorrhagic stroke are risks of regular aspirin use. What to do. Talk to your clinician about the risks and benefits of aspirin for you. And keep in mind that a healthy lifestyle can be far more effective than aspirin in preventing heart attacks and strokes.

Cognitive behavioral therapy more effective than light therapy for relieving seasonal depression

Up to 10% of Americans, about three-quarters of them women, have depressive symptoms at roughly the same time every year, usually November through March. The condition is known as seasonal affective disorder (SAD), and the first-line treatment today is light therapy—daily exposure to artificial bright light. But according to a study led by investigators at the University of Vermont, cognitive behavioral therapy (CBT) is more effective. The results, which appeared in the September 2009 issue of Behavior Therapy, showed that the benefits of CBT lasted for at least a year.

That finding may be especially significant given the shortcomings of light therapy. The patient has to sit near a “light box” every day for 30 to 45 minutes throughout the winter, a regimen that many can’t maintain. There’s also a risk to people with certain eye conditions, such as macular degeneration and diabetic retinopathy. Light therapy can trigger mania or hypomania in people with bipolar disorder. Most important, 20% to 50% of patients just don’t respond to it.

Antidepressants, including bupropion (Wellbutrin) and fluoxetine (Prozac), are also an option. But like any drug, they can cause side effects. And they need to be taken daily throughout the winter. By contrast, participants in the CBT study met twice a week for six weeks and needed no additional “doses” of therapy.

CBT is based on the idea that replacing negative thought patterns with more positive ones will lead to healthier behaviors. In the version used in the University of Vermont study, participants learned better ways to think about and cope with winter, including taking up new hobbies and scheduling more opportunities to socialize.

The study involved 69 participants, mainly women, who had taken part in earlier studies in which volunteers with SAD were randomly assigned to one of four groups: CBT, light therapy, CBT combined with light therapy, or a wait-list control group. The researchers conducted follow-up interviews one year later. Results showed that among those treated with CBT alone, only 7% had a recurrence, compared with 36.7% in those treated with light therapy alone. Symptoms were milder in the CBT group. And as measured by a standard depression inventory, 81% of the patients who had CBT alone were in full remission (no depressive symptoms), compared with 49% for the combination therapy group and 32% for the light therapy group.

This study was small, short-term, and preliminary, so many questions remain. For example, how long do CBT’s effects last? And how does the cost of CBT compare with other approaches? The researchers are now recruiting participants for a larger, five-year follow-up study that will be funded by the National Institute of Mental Health.
What to do about Bell’s palsy

Bell’s palsy is a sudden paralysis involving the nerve that controls the muscles on one side of the face. It can cause startling changes on the affected side: a drooping mouth, a sagging eyebrow and lower eyelid, and an eye that won’t fully close. Bell’s palsy is not life-threatening, and its symptoms are usually temporary, but they can be very distressing, interfering not only with facial appearance but also with the ability to speak, eat, sleep, or enjoy food. Recovery can take weeks to months, during which many people curtail their usual activities; some become socially isolated.

Bell’s palsy usually begins without warning and develops quickly—over the course of hours. It may be preceded by symptoms suggesting a viral illness, such as fatigue or a headache. The facial weakness generally peaks within 24 hours and thereafter rarely worsens. But it doesn’t get better right away, either, and that can be discouraging.

Causes and treatment

Most scientists believe that Bell’s palsy is triggered by a viral infection that inflames the facial nerve. This nerve arises in the brain and meanders through the bony structures of the ear and the muscles of the face. It’s made of thousands of nerve fibers that carry signals to and from the facial muscles as well as the saliva and tear glands (see illustration). It also plays an important role in taste sensation.

Bell’s palsy occurs when the facial nerve swells and is pinched at the point where it passes through a narrow passageway in the skull beneath the ear, causing drooping and other symptoms on that side of the face. The affected eye may appear teary but remains mostly dry and irritated because it cannot blink or close completely. Drooling is another common symptom. Some people experience numbness, ear pain, or hypersensitive hearing on the affected side.

The exact cause of Bell’s palsy isn’t known, but in recent years, attention has focused on herpes simplex type 1 virus, the virus that causes cold sores. Other viral suspects include herpes zoster (the chickenpox and shingles virus) and another virus in the herpes family, Epstein-Barr, which causes mononucleosis. Clinicians have generally recommended early treatment with an antiviral medication, as well as a corticosteroid to quell inflammation. But recent evidence has begun to cast doubt on this approach.

The evidence

In a 2007 study in The New England Journal of Medicine, 551 Bell’s palsy patients were randomly assigned to take either prednisolone (a corticosteroid), the antiviral drug acyclovir (Zovirax), both medications, or a placebo. After nine months, 94% of patients who took prednisolone were fully recovered. Patients who took only acyclovir did no better than those who took placebo pills, and the acyclovir-prednisolone combination was no better than prednisolone alone. A randomized trial published in the November 2008 issue of The Lancet Neurology produced comparable results: time to recovery was improved with prednisolone, while treatment with valacyclovir (Valtrex), whether alone or in combination with prednisolone, had no impact on patient recovery times. A 2009 systematic review by the Cochrane Collaboration, an international organization that evaluates medical research, determined that antivirals are less effective than steroid drugs and no more effective than a placebo in bringing about a complete recovery. The authors also question whether herpes simplex is a cause of Bell’s palsy.

What now?

If you notice any facial weakness, see your clinician right away. Early treatment (within three days of the start of symptoms) with a corticosteroid could increase your chance of a full recovery. It’s also important to rule out other conditions that can cause Bell’s palsy—like symptoms, including Lyme disease and other bacterial infections, Ramsay Hunt syndrome (caused by the herpes zoster virus), Sjögren’s syndrome, and some types of tumors.

Most people start to get better within a couple of weeks and return to normal function after three to six months. During that time, you need to prevent the affected eye from drying. That may entail applying artificial tears every hour while you’re awake and an ophthalmic ointment at night. You may also need to wear an eye patch at night and other protective eyewear during the day.
Time for tooth whitening?

The eyes may be the windows to the soul, but the teeth may also be the first thing others notice.

Maybe it was your 35th high school reunion photograph—or perhaps an innocent remark by a grandchild—but now you’re self-conscious about your dingy teeth, and you’re thinking about whitening them. Dentists can perform or supervise various whitening procedures, and over-the-counter whitening products are available at drugstores and supermarkets. What’s best for you depends on several things, including the type of discoloration and the amount of time and money you’re willing to spend. There are two main types of whitening products. Some, chiefly whitening toothpastes, remove surface stains by polishing with chemical agents or mild abrasives. These don’t alter the tooth’s natural color and can only lighten its appearance slightly. The other type of product contains a peroxide bleaching agent (carbamide peroxide or hydrogen peroxide) that changes the color of the tooth and can lighten it by several shades. Our focus here is on these products.

Getting help from a dentist

The American Dental Association (ADA) recommends that you consult your dentist before using any bleaching product, even an over-the-counter one. Bleaching can be uncomfortable for people with sensitive teeth or gum recession. Also, most products will bleach only natural tooth enamel, so if you have tooth-colored fillings, crowns, veneers, or partial dentures, bleaching may yield uneven results.

Your dentist can evaluate whether bleaching is right for your teeth, since different kinds of discoloration respond differently to whitening. For example, bleaching works for most stains caused by age, smoking, and regular coffee or tea drinking, but it may not be effective against discoloration that results from tetracycline use in children under age 8. (Tooth discoloration can also occur in a child whose mother took tetracycline while pregnant.) Finally, even if you choose the over-the-counter route, your dentist can advise you on the relative merits of the products available.

Dentist-supervised procedures include the following:

In-office bleaching. A neutralizing gel or a rubber shield is placed on your gums to protect them. Your dentist then applies a peroxide bleaching agent to your teeth and exposes them to a bright light or laser to hasten the lightening. Achieving the color you want usually takes three to four sessions, each lasting 30 to 60 minutes. A new technique, called power bleaching, uses a highly concentrated form of hydrogen peroxide and requires only one session. In-office bleaching costs $500 to $1,200 for the whole mouth. Results generally last for one to three years.

Dentist-prescribed home bleaching. Your dentist takes an impression and makes a custom-fitted mouthpiece to hold the peroxide bleaching gel. You wear the gel-filled mouthpiece for an hour or two every day, or overnight, for a week or two. Some users experience tooth sensitivity, but it usually subsides once the treatment is complete. Dentist-prescribed home bleaching for the whole mouth costs $300 to $600. Currently, 10% carbamide peroxide tray-applied gel is the only home-use whiten that carries the ADA Seal of Acceptance, which means that it meets ADA standards for safety and effectiveness.

Bleaching teeth with pulp damage. If your tooth has darkened because the pulp (the soft interior of the tooth) is dead or injured, your dentist can treat the pulp chamber with a bleaching agent during root canal therapy.

Over-the-counter bleaching products

All of the following over-the-counter products contain peroxide as their active ingredient. The concentration is lower in these agents than in the products dentists use, and the cost is substantially lower, ranging from $20 to $150.

Whitening strips. You apply these thin, flexible pieces of plastic directly to the teeth, usually for a half-hour once or twice a day for five days to two weeks. (Strips used for a shorter time have a higher concentration of peroxide and may cause greater tooth sensitivity.) The effects can last for up to 12 months.

Gels. All gels are similar, though some are applied with a small paintbrush and others come in a penlike applicator or are placed in a mouthpiece. Gels are typically applied daily before bedtime and left on overnight, usually for about two weeks. Effects may last up to six months.

Whitening rinses. Whitening rinses are swished through the teeth for 60 seconds twice a day before brushing and are used on an ongoing basis. (A 16-ounce bottle—about a one-month supply—costs $6 to $8.)

Safety and effectiveness

There’s very little evidence on the long-term safety and effectiveness of tooth-whitening products or procedures. No over-the-counter bleaching product carries the ADA Seal of Acceptance, and the organization recommends consultation with a dental professional before using them. An analysis of clinical trials by the independent Cochrane Collaboration concluded that whitening products appear to be effective, but consumers should be better informed of side effects such as tooth sensitivity and gum irritation. Noting that the products’ manufacturers sponsored most of the studies, the reviewers recommended more independent research.

Whitening products aren’t recommended for children under age 16, for women who are pregnant or breast-feeding, for people with sensitive teeth or an allergy to peroxide, or for those with gum disease or worn tooth enamel. If any whitening product causes irritation or mouth sores, you should stop using it immediately and see your dentist.
**BY THE WAY, DOCTOR**

### What can I do about chronic leukorrhea?

**Q** I’m a healthy 62-year-old. In the past three months, I’ve developed a vaginal discharge and discomfort. Tests for vaginal infections have been negative. I’ve tried douching and sitz baths. I started using vaginal estrogen (Premarin) cream about two months ago. Nothing helps. I’d appreciate your thoughts on this problem, which my gynecologist calls “chronic leukorrhea.”

**A** Many women have problems with vaginal discharge or pain or irritation of the vulva and vagina. These difficulties can occur during the reproductive years, through the menopausal transition, and beyond. Diagnosing and treating these conditions can be challenging, for several reasons. Some clinicians aren’t well enough educated about this important area of woman’s health, and even medical experts don’t know enough about the normal and abnormal vulva and vagina. Also, patients may be unwilling to bring up vulvar or vaginal symptoms or hygiene.

The most common cause of vaginal discharge and pain in a postmenopausal woman is atrophic vaginitis. This condition develops when vaginal tissues become dry, and then thin, inflexible, and inflamed because of estrogen deficiency. Symptoms usually respond to estrogen in the form of a vaginal cream, tablet, or ring. Estrogen can take two to three months to work, and I wonder if you’ve seen any improvement by now. Douching is usually not recommended, since it can disrupt the growth of normal vaginal bacteria.

What else might be going on? Here are some of the possibilities:

- Sensitivity or an allergic reaction to a product such as a detergent, lubricant, or the spermicide on a condom. Maybe none of those apply to you. But keep in mind that the vulva and vagina are very sensitive. It’s important to use only mild soap, avoid other potential irritants, wear cotton underwear during the day (and none at night), and avoid tight pants.

- Desquamative inflammatory vaginitis—a vaginal condition of unknown cause with symptoms that include pain and a yellow or yellow-green discharge. It’s diagnosed by examining the vaginal discharge under a microscope, and it’s treated with cortisone suppositories and sometimes antibiotics.

- Lichen planus—a condition of the vagina and vulva (and sometimes the mouth) that makes tissue vulnerable to the development of ulcers and infections. Lichen planus is diagnosed with a biopsy and treated with steroids.

Rarely, persistent discharge is due to an abnormal connection between the vagina and the rectum called a fistula. Discharge may also originate in the cervix, the uterus, or even the fallopian tubes.

It’s hard to say more without further information or a physical exam. Chronic leukorrhea can have many different causes, and effective treatment will depend on learning what’s at work in your particular case.

For more information about vulvar and vaginal conditions, try the Web site of the International Society for the Study of Vulvovaginal Disease, www.issvd.org/patIENTeducation.asp. Another good resource is The V Book: A Doctor’s Guide to Complete Vulvovaginal Health, by Elizabeth G. Stewart, M.D.

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### Is it safe to take high doses of vitamin D?

**Q** On the basis of a blood test, my doctor wants me to take high doses of vitamin D for three months. I hear there are wide variations among laboratories performing these tests. Should I trust my first results, or take the test again? What are the risks of taking high doses of vitamin D?

**A** Vitamin D is essential to bone metabolism; below-normal blood levels can increase your risk for osteoporosis, falls, and possibly fractures. There are three main forms of vitamin D. The active form found in our bodies is 1,25-dihydroxy-vitamin D₃; the body makes it from two precursors, vitamin D₂ and vitamin D₃. Foods and supplements are the main sources of vitamin D₃. Vitamin D₃ is produced in the skin through exposure to ultraviolet light (as in sunlight); it’s also found in foods and supplements. Both vitamin D₂ and vitamin D₃ are converted into active vitamin D in the liver and the kidneys.

Vitamin D levels decline when sun exposure is reduced, especially during the winter in northern latitudes. In addition, we absorb vitamin D less efficiently with age. So older people and those with limited sun exposure (including those who are housebound) are especially at risk for low
Does carbonated water harm bones?

Q I've heard that club soda, seltzer water, and sparkling mineral waters rob the bones of calcium. Is this true?

A Warnings about the harmful effects of carbonated beverages on bone emerge from time to time. The theory is that the phosphoric acid (phosphate) used to enhance flavor in some carbonated beverages can interfere with calcium absorption and result in the loss of calcium from bone. Fortunately, there's no good evidence that a high phosphate intake affects bone metabolism or bone density.

Still, carbonated beverages have long been associated with low bone density and fractures in adolescent girls. To investigate this association in adults, researchers at Tufts University examined data from 2,500 women and men (ages 49 to 69) involved in the Framingham Osteoporosis Study. They assessed dietary intake and measured bone mineral density (BMD) at the spine and hip.

Non-cola carbonated drinks were not associated with low BMD, but cola intake was associated with lower BMD at the hip (though not the spine) in the women, but not in the men. The more cola a woman drank, the lower her BMD. Women who drank more cola didn't drink less milk, but they did have a lower intake of calcium.

In 2005, the British Journal of Nutrition published the results of a small clinical trial comparing healthy postmenopausal women who drank about one quart of noncarbonated mineral water daily with those who drank the same amount of carbonated mineral water. After eight weeks, blood and urine tests for bone turnover showed no difference between the two groups.

It looks as though drinking seltzer water doesn’t contribute to osteoporosis or increase fracture risk in women. The authors of the cola study suggested that the caffeine in the colas may account for the cola-drinkers’ lower BMD. Other studies have also reported an association between caffeine and lower BMD. In some cases, soft drinks displace calcium-rich beverages, such as milk, and experts think that this, rather than any direct effect of soft drinks on bone, may explain the effect on BMD in adolescent girls.

So feel free to enjoy seltzer water without worrying, but don’t overdo the caffeinated beverages, whether carbonated or not. And if you suspect that by drinking seltzer water, coffee, colas, or other soft drinks you may be reducing your intake of healthy beverages—such as calcium-fortified juices or vitamin D–fortified low-fat or skim milk—make sure you get enough calcium (1,200 to 1,500 mg per day) from other sources to compensate.

Celeste Robb-Nicholson, M.D.
Editor in Chief, Harvard Women’s Health Watch

blood levels of vitamin D. Other risk factors are malabsorption syndromes (like Crohn’s disease), dark skin (which blocks vitamin D production through sunlight), and excess fat, which can hinder the release of vitamin D into the blood. Too little vitamin D in the blood triggers the release of parathyroid hormone (PTH), stimulating bone resorption (breakdown). When blood levels of vitamin D rise above 30 nanograms per milliliter (ng/mL), PTH returns to normal and bone resorption slows. Most experts believe that a vitamin D level below 30 ng/mL can cause excessive bone resorption.

For most women, getting 800 to 1,000 international units (IU) of vitamin D per day provides enough vitamin D for normal bone metabolism. If a vitamin D level is below 30 ng/mL, the deficiency can be corrected by taking high doses—50,000 IU of vitamin D as a single dose once a week for six to eight weeks.

The safe upper limit for vitamin D supplementation is 2,000 IU per day. But over limited time periods, even very high doses are safe. The chief adverse effects, which are due to high levels of calcium in the blood and urine, do not occur unless vitamin D levels reach 88 ng/mL—a concentration that is unlikely to result from either high-dose treatment or regular supplementation.

It’s true that laboratory test results can vary considerably. Still, if your blood level is hovering around 30 ng/mL, you could take the high doses for six to eight weeks. It’s safe—and less expensive than being tested a second time. After you’ve completed the high-dose treatment, take a daily vitamin D supplement of 800 to 1,000 IU. And be sure to get 1,200 to 1,500 milligrams (mg) of calcium a day through diet or supplements.

Because of the volume of mail we receive, we can’t answer every letter, nor can we provide personal medical advice.