



Mammograms: Overdiagnosis and Overtreatment

When my wife sees her OB/GYN doctor, she is always asked about her most recent mammogram. She replies that she's never had one, which invariably leads to a lecture on the importance of breast cancer screening and an order for a mammogram at a nearby imaging center.

Connie used to try to explain why she doesn't get mammograms. She's in great health, eats a good diet, takes appropriate supplements, maintains her ideal weight, exercises, and has no family history of breast cancer.

Above all, she's aware of what most women are not. Screening mammography has not reduced the incidence of advanced breast cancer or lowered death rates. Instead, it has spawned an epidemic of false positives (suspicious findings that turn out to be normal), overdiagnosis (diagnosis of disease that will never cause illness or death), and overtreatment (unnecessary medical interventions).

"My patients' fear of breast cancer is palpable. I see them fret over whether or not to have a mammogram, worry about false positive[s]... However, increasing evidence now indicates a less obvious outcome of cancer screening—overdiagnosis of diseases that would never cause symptoms or death... The mantras, 'All cancers are life-threatening' and 'When in doubt, cut it out,' require revision."

Elmore J. *N Engl J Med.* 2016; 375:1483–6.

who were screened, including adverse effects of overtreatment (e.g., increased risk of heart and lung problems from radiation therapy). Furthermore, the frequency of advanced cancers—the deadly kind that mammograms are supposed to prevent—has held steady. The most likely reason for the reduction in breast cancer deaths is the development of better treatments, not early detection.

Evidence has been building for years. A 2017 study comparing long-term outcomes of Danish women who had mammograms with those who did not concluded that screening did not reduce the incidence of advanced tumors. Another recent study, which tracked 8 million Dutch women over 24 years, found that the Netherlands' biennial (every two years) screening program has had

little effect on advanced cancer or cancer deaths.

Serious Collateral Damage

It is increasingly clear that breast cancer screening has not lived up to its early promise and ongoing hype. Even worse, it inflicts tremendous collateral damage. Mammography may not prevent advanced cancer, but it is very good at picking up "suspicious" benign changes and early-stage disease.

More than half of women who have yearly mammograms in their 40s have at least one false positive by age 50. Of course it's a relief when it turns out to be benign, but it's still stressful, and additional tests (X-rays, biopsies, etc.) have risks of their own.

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No Fewer Advanced Cancers, Overall Deaths

The rationale for screening is that detection and treatment of breast cancer in its earliest stages will prevent the development of advanced disease and deaths. Problem is, it's a faulty rationale.

Breast cancer screening has never been shown to reduce overall mortality rates. Since mammography programs were launched in the 1970s, deaths from breast cancer have declined, but that decline has been offset by deaths from other causes in women

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Dear Reader,

It's no secret that Americans are frustrated and dissatisfied with our healthcare system. In a survey conducted last year by West, a technology-communications company, rising costs were the leading complaint, but respondents also expressed worries about the quality of care they were receiving.



Suzanne and Raymond Berg

Most agreed they should be more committed to prevention and wellness and acknowledged that adopting better habits would improve their health. However, they didn't hold themselves solely accountable. They stated they would be more likely to make lifestyle changes if their doctors educated, reminded, and "pushed" them to make healthier choices. An astounding 83 percent actually believed that their healthcare providers were responsible for their well-being.

Sorry, folks, but there's only one person responsible for your health, and it is not your doctor. Of course physicians could do better about educating and encouraging patients. But at the end of the day, you're the one who has to get off the couch and exercise, select healthy foods, take your supplements, and schedule appointments. It's that simple.

Take Suzanne and Raymond Berg, who recently made their 17th trip to Whitaker Wellness from Minnesota. Neither Suzanne nor Raymond—who are in their 70s and enjoying second careers as models and actors—has any significant health problems. Yet they've returned year after year. Why?

"It's like our cars and appliances," Raymond explained. "You have to maintain them and service them from time to time. That's what we're doing with our bodies, fine-tuning and making sure nothing's out of whack. You can't wait until you're sick to get serious about your health."

Suzanne added, "We do pay attention to our daily habits. Although we aren't perfect, eating right is second nature. The same goes for exercise and supplements. We also laugh a lot. A sense of humor is important, as is our faith in the Lord." Raymond seconded that. "A positive attitude, a purpose outside yourself, and peace of mind go hand in hand with good health. It shows in your vitality and how you come across to others—and it's self-perpetuating."

Do as the Bergs do and take a proactive role in prevention and wellness. You'll reap the health dividends for years to come.

To your health,

Overdiagnosis is even more harmful. Not only does it burden women with the erroneous belief that they have a potentially fatal disease, but it also leads to unnecessary treatment. The studies discussed earlier found that a third to half of the breast cancers detected on screening represented overdiagnosis!

For example, 20–25 percent of cancers seen on mammograms are ductal carcinoma in situ (DCIS): noninvasive disease confined to the milk ducts. DCIS—called stage 0 breast cancer by some experts but not even considered to be cancer by others—is not life threatening. Although it can progress to invasive disease, in most cases it does not. Nevertheless, the usual course is lumpectomy and radiation or a complete mastectomy, often followed by years of hormone therapy, with all their attendant risks.

Cancer is a terrifying diagnosis, and many patients just want it gone, no matter how slight the risk. However, the fact remains that treating early-stage cancers that would have gone undetected if not for screening mammograms—and would never adversely affect health if left alone—can only cause harm.

The Mammography Cult

Despite these serious flaws, screening mammography has achieved a cult-like following. Virtually all primary care and OB/GYN physicians recommend it.

More conservative doctors may go with guidelines from the US Preventive Services Task Force (USPSTF), an independent advisory expert panel that recommends mammograms every other year for women ages 50–74. More will follow the American Cancer Society's schedule of annual mammograms from ages 45 to 54, then every other year after that. But most side with the American College of Radiology, an organization of radiologists and radiation oncologists that calls for yearly mammograms for all women over age 40.

Screening advocates such as “pink ribbon” nonprofits and physician groups—many with financial support from imaging centers, device manufacturers, drug companies, and other vested interests—and their cheerleaders in the media have turned breast

cancer awareness into an emotionally charged circus. Fundraisers trot out cancer survivors who, convinced that screening mammograms saved their lives, share heartrending testimonials. Even the US legislature is in on the gig. After the USPSTF came out with their recommendation to delay screening until age 50, Congress passed laws overriding it and requiring insurers to cover mammograms starting at age 40.

These efforts have paid off. More than 65 percent of US women in their 40s and older have had a mammogram in the past two years, and screening is a \$10 billion a year business.

Opting Out

Do not mistake this as a personal bias against cancer screenings. I heartily endorse screenings that have proven effective in reducing deaths, such as cervical and colorectal cancer. That is not the case with breast cancer screening.

The American Cancer Society predicts over 268,000 new breast cancers and nearly 64,000 cases of DCIS will be

diagnosed in 2018, and one in eight women will be diagnosed during her lifetime. How many of these women's lives will be irrevocably altered by overdiagnosis? How many will be harmed by overtreatment?

I have no doubt that a valid screening tool will eventually be developed, one that can analyze tumor aggressiveness and determine who would benefit from treatment and who would be harmed by overtreatment. Until then, regular mammograms for high-risk individuals are appropriate, but asymptomatic women with no family history should rethink the wisdom of screening.

Whether or not you have a mammogram is a personal choice, but I urge you to learn more about this and discuss it with your doctor. Above all, be confident that opting out is a sane and responsible decision.

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Real Breast Cancer Prevention

- ▶ Modify/control risk factors such as obesity, inactivity, excessive alcohol, smoking, inadequate sleep, night shift-work, exposure to radiation and chemicals, progestin (synthetic progesterone), and elevated insulin (insulin resistance).
- ▶ Eat a diet low in processed carbs and red meat with lots of broccoli and other cruciferous vegetables, leafy greens, garlic, soy, and lignin-rich flaxseed.
- ▶ Take protective supplements: an antioxidant-rich daily multivitamin, vitamin D 2,000–5,000 IU, curcumin as directed, indole-3-carbinol (I3C) 200–400 mg, and melatonin 3 mg (at bedtime).

Dear Dr. Whitaker

Q *What do you think about energy drinks? My son drinks a can or two a day. — Peter N., Wisconsin*

A I'm not a fan, especially for kids. I'm not sure how old your son is, but these popular beverages can be problematic for young people. A 2018 Canadian survey of over 2,000 people aged 12–24 found that three-fourths of respondents had consumed energy drinks, and more than half of those had experienced negative health consequences such as trouble sleeping, rapid heartbeat, and headaches. A small percentage even had seizures! In addition to caffeine, these drinks are often loaded with sugar and contain other stimulating ingredients that may have undesirable effects. You may not want your son to drink coffee, but most of the energy, focus, and athletic performance benefits of these drinks come from caffeine, and coffee is a safer and much less expensive option.

Q *My office is freezing! I tend to run cold anyway, but this is ridiculous. I have asked about resetting the thermostat but no dice. Do you know of any supplements I can take to warm up my body temperature? — Sue H., California*

A Some folks say thermogenic supplements that rev up metabolism, such as green tea extract and capsaicin from hot peppers, increase their body temperature, but I doubt they'd make much of a difference. If you always run on the cold side, have your thyroid levels checked, as sensitivity to cold is a

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New Online: Health and Household Benefits of Vinegar

Vinegar has quite a fan base. Proponents laud its merits for digestive disorders, skin conditions, weight, and more. However, its best-studied benefit, as demonstrated in a 2017 meta-analysis, is reducing after-meal glucose and insulin levels. The study concluded, "...[vinegar] could be considered as an adjunctive tool for improving glycemic control." The usual recommendation is 1–2 tablespoons of apple cider vinegar, in food (with olive oil as salad dressing) or drink (diluted with water) twice a day before meals.

But that's not vinegar's only claim to fame. Subscriber Katherine B. from Texas wrote, "When my microwave gets dirty, I pour 1/4 cup of distilled white vinegar into a coffee cup and microwave it for 1–2 minutes. As it boils and vaporizes, it softens the cooked-on food, which can be easily wiped off. I also put about half a cup in the fabric softener dispenser of my washing machine (instead of harsher chemicals) to remove soap residue and odors. And for cleaning the dishwasher, place a glass filled with 1–2 cups of vinegar upright on the top shelf of an otherwise empty dishwasher and run it through the normal cycle." Great tips. To learn more about the health and household benefits of vinegar, visit drwhitaker.com.

classic sign of hypothyroidism (low thyroid function). Anemia is another common culprit, and poor circulation due to diabetes or other causes may also be a contributing factor. Aside from that, my advice is to keep an extra sweater or coat at your desk, bring a blanket for your lap, consider a space heater, and opt for hot beverages to warm you from the inside out. Movement also helps, so make a point to get up every hour or so and take a quick stroll.

Q *Do you have information on CMO (cetyl myristoleate)? I read that it helps arthritis pain and want to try it. — D.S., via email*

A Some of my patients and subscribers swear by cetyl myristoleate, a naturally occurring fatty acid with potent anti-inflammatory activity. Paul found that it relieved severe back and muscle pain he had suffered with for 40-plus years. After S.P. started taking CMO, he had markedly reduced musculoskeletal pain, increased range of motion, and was able to stop using Motrin and Tylenol. Although there isn't a lot of research on CMO, a small double-blind, placebo-controlled study of patients with arthritic knee pain published last year concluded that the majority of participants who took supplemental CMO for 12 weeks had significant improvements in pain and function. One good brand that can be found online and in health food stores is Natrol's Cetylpure. Use as directed, and let me know how it works for you.



Works for Me...

► **Cardiomyopathy** *I have cardiomyopathy and my doctor at your clinic started me on testosterone therapy to strengthen my heart. My cardiologist initially said not to take it, but I am doing so much better that he is now recommending it to his other patients. — R.E., California*

Known mostly for boosting libido, testosterone actually boasts a wide range of benefits, including heart health. In addition to bolstering the heart muscle, a recent study in *JAMA Internal Medicine* found that men with low testosterone levels who were treated with supplemental testosterone had a reduced incidence of heart attack and stroke compared to a control group. Testosterone therapy requires a prescription and is only appropriate when deficiencies are present. A4M.com has a database of doctors across the country trained in bioidentical hormone replacement.

► **Muscle Weakness and Pain** *Not long after my doctor prescribed Zocor to lower my cholesterol, I started having problems with my usual*

exercise routine (walking and weights). It got worse, and I developed pain in my legs. I read about statins causing these problems and stopped Zocor (which did not make my doctor happy). Within a few months, the weakness and pain subsided. — Tony G., Oklahoma

One in five statin takers experience myalgias (muscle-related side effects). These drugs are also linked with increased risk of diabetes and memory problems. To learn more about statins and how coenzyme Q10 protects against adverse effects, visit drwhitaker.com.

► **Chronic Diarrhea** *I have had diarrhea for as long as I can remember. I had never gone more than four days without it—until I had reflexology at your clinic. After just one treatment with your reflexologist Paul Harvey, it was gone. I had a few more treatments for good measure, and I continue to do well. I am also more careful with my diet, but I attribute my healing to reflexology. — Alice S., via email*

Reflexology is a remarkable treatment for many conditions, including chronic pain, headaches, and insomnia. To learn more and locate a reflexologist in your area, visit arcb.net.

🗣️ **Do you have a Health Tip to share? We'd love to hear it! Send it to worksforme@drwhitaker.com.**

Health Hack: Pollution Hampers Benefits of Exercise

Walking is great exercise. Just 30 minutes a day of brisk walking helps improve fitness, control blood sugar, reduce belly fat and weight, boost mood and memory, and keep you regular. However, research recently published in *The Lancet* shows that where you work out matters. Walking near streets with high traffic volume and high levels of pollution actually negates the cardiorespiratory benefits of exercise! Don't let this discourage you. Just stick to parks and other green spaces to get the most bang for your buck.

Monthly Health Quiz:

Hairy Tales: True or False?

- A) Hair can be present anywhere on the body.
- B) 97% of the world's population has brown or black hair.
- C) Supplements can improve hair growth.
- D) 85% of men and over 50% of women will have significant hair loss during their lifetime.



Answer:

A is false. B, C, and D are true. The only places hair can't grow are the palms of hands, soles of feet, mucous membranes, and lips. Two percent of the population is blonde and one percent redheaded. Biotin, zinc, and silica have been shown to promote hair growth and strength.

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Notable Quote

“Our greatest happiness does not depend on the condition of life in which chance has placed us, but is always the result of a good conscience, good health, occupation, and freedom in all just pursuits.”

— Thomas Jefferson, April 13, 1743–July 4, 1826

No computer? Mail your question or health tip to *Health & Healing*, 6710-A Rockledge Dr., Ste. 500, Bethesda, MD 20817.

Crazy About Carotenoids

Carotenoids color our world. They're the buttery yellow of daffodils, the pink plumage of flamingos, the brilliant palette of autumn leaves, and the vivid hues of carrots, watermelon, salmon, and egg yolks. But these organic pigments provide more than a visual treat—they also enhance our health.

Produced in a wide range of plants, algae, and some bacteria, carotenoids have two primary functions: absorbing light necessary for photosynthesis and protecting against oxidative stress resulting from excessive sunlight, heat, drought, and other environmental insults.

These same antioxidant and light-absorbing properties are also central to the benefits provided by carotenoid-rich foods. Numerous studies link a high intake of leafy greens and yellow, orange, and red fruits and vegetables to a reduced risk of macular degeneration and other vision disorders, cardiovascular disease, some types of cancer, and even cognitive decline.

Vitamin A Precursors

More than 750 carotenoids have been identified, but the most abundant in the human diet are beta-carotene, alpha-carotene, beta-cryptoxanthin, lycopene, lutein, and zeaxanthin. The first three are often referred to as provitamin A, meaning they can be converted in the body to vitamin A.

Vitamin A (retinol) is an essential nutrient required for normal growth and development, vision, and immune function. Deficiencies are a leading cause of preventable blindness, susceptibility to infectious diseases, childhood mortality, and skin problems. Boosting vitamin A status improves immunity and reduces blindness and deaths in children in developing countries, and retinol derivatives are used to treat skin and vision disorders.

Because preformed vitamin A, naturally present in liver, oily fish, animal fat, and dairy products, is toxic in excessive amounts, carotenoids are often used in its place in multivitamins. (Labels may read "Vitamin A from beta-carotene and mixed carotenoids.") That's because carotenoids' conversion to vitamin A is dependent on vitamin A status and is produced only as needed.

Lycopene, Lutein, and Zeaxanthin

Not all carotenoids are provitamin A. Lycopene, the pigment that tints tomatoes, watermelon, and pink

grapefruit, has no vitamin A activity. Nevertheless, it is one of the most potent carotenoids in terms of quenching free radicals and reducing inflammation.

Epidemiological research suggests that a hearty intake of lycopene-rich foods is protective against cardiovascular disease, hypertension, stroke, lung cancer, and especially prostate cancer, the most common cancer in American men. Although results are somewhat mixed for localized tumors, a 2015 meta-analysis found an inverse relationship between advanced or aggressive prostate cancer and blood levels of lycopene.

Lutein and zeaxanthin don't convert to vitamin A either. However, these unique carotenoids, which are concentrated in the macula—the area in the center of the retina responsible for central, color, and detailed vision—have extraordinary benefits for the eyes. The Age-Related Eye Disease Study 2 (AREDS2) found that supplements containing lutein, zeaxanthin, vitamins C and E, zinc, and copper reduced the rate of the leading cause of blindness in older people, advanced age-related macular degeneration, by around 25 percent.

Your Eyes Need Lutein...

We all need to beef up on lutein and zeaxanthin. These two carotenoids absorb potentially harmful high-energy, short-wavelength blue light and curb oxidative stress in the eyes, just as they do in plants. The more lutein and zeaxanthin in the macula, the greater the macular pigment optical density (MPOD) and protection for your eyes. A robust MPOD can absorb up to 90 percent of blue light!

LED and compact fluorescent lights, smartphones, computers, digital tablets, and TVs all emit relatively high levels of blue light. Prolonged exposure causes eyestrain and fatigue, interferes with sleep, and may impair cognitive function. Given that old-school incandescent bulbs that produce much less blue light are all but banned—and Americans average more than 10 hours a day viewing computer, tablet, or smartphone screens—we are bombarded with blue light.

Concerned about the cumulative adverse effects of blue light, researchers from the University of Georgia conducted a study to see if supplemental lutein and zeaxanthin might reduce some of the vision and other complaints associated with prolonged screen time. They enrolled healthy young men and women who spent at least six hours a day looking at digital screens,

measured their MPOD, and had them take either a lutein-zeaxanthin supplement (24 mg total) or a placebo every day for six months.

When they were reevaluated, participants taking the carotenoid supplement had a remarkable 30 percent average increase in MPOD, compared to minimal changes in the placebo group. They reported significant improvements in visual performance, eye strain and fatigue, headache frequency, and sleep quality as well.

...So Does Your Brain

Intriguing new research demonstrates that these carotenoids also enhance cognitive function. MRI scans confirm that lutein and zeaxanthin accumulate in the brain and support the integrity of the white matter, which declines as we get older.

In a randomized, double-blind, placebo-controlled clinical trial published in 2018, Irish researchers tested the effects of a lutein-zeaxanthin supplement on memory, executive function, and verbal fluency in healthy people who initially had low levels of these carotenoids. After 12 months they were retested, and the participants taking the supplement had markedly better scores than the placebo group.

Of note, significant improvements were observed in something that plagues many of us as we get older: episodic memory, or the ability to learn, store, and retrieve information about specific experiences (what you had for lunch yesterday, where you parked your car, details about your wedding, etc.). Furthermore, improvements were closely related to increases in lutein and zeaxanthin concentrations.

Another 2018 study concluded that 12 months of supplemental lutein and zeaxanthin also improved cognitive test scores in older people. I will keep you posted on developments in this area, but I find it very exciting that the supplements many of us take to protect our eyes also give our brains a boost.

“Eat the Rainbow” & Take Supplements

To reap the diverse benefits of carotenoids, dietitians recommend that you “eat the rainbow.” Great advice. Brightly colored beta-carotene-rich carrots, pumpkin, sweet potatoes, and leafy greens; lycopene in watermelon and tomato paste, sauce, soup, and juice;

lutein- and zeaxanthin-dense spinach, kale, collards, and mustard greens all pack a serious carotenoid punch.

Because carotenoids are fat-soluble, a little fat or oil (3–5 g, or about a tablespoon of oil) is necessary for optimal absorption. Raw salads are fine, but make sure you include cooked vegetables as well. Unlike many phytonutrients, carotenoids’ nutritional value dramatically improves with chopping, pureeing, and especially cooking, as processing releases them from the plant matrix and increases absorption in the intestines.

There’s no replacement for a good diet, but it often isn’t enough. Did you know that in a typical day, the average American gets just 10 percent of the lutein and zeaxanthin used in the AREDS2 vision study? I strongly recommend a good multivitamin with beta-carotene and mixed carotenoids, supplemental lutein and zeaxanthin if you’re concerned about vision and brain health, and lycopene, particularly for men at risk of prostate cancer.

Carotenoids are exceptionally safe. Concerns have been raised about beta-carotene supplements’ link with increased risk of lung cancer, especially in long-term smokers. However, careful analysis of all the research gives it a thumbs-up for everyone else. I personally take beta-carotene in my daily multi and highly recommend it.

The only predictable side effect with high amounts of carotenoids from supplements or diet is they may give your skin a yellow-orange hue. Actually, some people load up on carrot juice or supplements specifically to get that healthy golden glow. And with summer around the corner, it’s good to know carotenoids also provide some protection against sunburn.

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My Recommendations

- ▶ Eat a colorful, carotenoid-rich diet.
- ▶ Suggested daily amounts of supplemental carotenoids: beta-carotene 15,000 IU, lutein 10–40 mg, zeaxanthin 2–4 mg, and lycopene 6 mg. Beta-carotene is generally included in multivitamins, lutein and zeaxanthin in vision supplements, and lycopene in prostate formulas.
- ▶ Smokers should go easy on beta-carotene supplements. Better yet, stop smoking.

Innovations in Wellness Medicine

Anti-Inflammatory Diet for Reduced Cancer Risk

Acute inflammation is the body's normal response to illness or injury and a vital part of the healing process. Chronic inflammation, on the other hand, can lead to a whole host of health problems, including "the big C." There are several steps you can take to quell systemic inflammation, and one of them, according to a 2018 study, significantly reduces risk of colorectal cancer, the third-leading cause of cancer-related deaths in the US.

Harvard researchers evaluated the long-term dietary habits of more than 46,000 men and 72,000 women and found that those who ate a pro-inflammatory diet (heavy on red meat, processed foods, and sugary beverages) were 32 percent more likely to develop colorectal cancer than their peers who ate an anti-inflammatory diet (colorful vegetables, low-glycemic fruits, omega-3-rich fish, lean protein, healthy fats, nuts, seeds, and beans). To mitigate cancer risk and counter inflammation, opt for an anti-inflammatory diet, be mindful of your weight, go easy on alcohol, and take a multivitamin and supplemental omega-3s, curcumin, probiotics, and vitamin D. Also, be aware that colorectal cancer screening for average-risk, asymptomatic people ages 50–75 years has proven benefits.

Vitamin E for Metabolic Syndrome

Vitamin E is an antioxidant powerhouse. In addition to mopping up free radicals in cellular membranes and in LDL cholesterol, this important nutrient is also required for proper immune, vision, and neurological function. Yet nutritional surveys estimate that 93 percent of men and women in the US fail to get the RDA of vitamin E. This is bad news, particularly if you have metabolic syndrome.

Metabolic syndrome—a cluster of symptoms that includes high blood sugar, hypertension, elevated lipids, abdominal obesity, and insulin resistance—is a harbinger of diabetes and heart disease. New research from the Linus Pauling Institute has concluded that individuals with metabolic syndrome need 30–50 percent more vitamin E than healthy people to help counter the accelerated oxidative damage and inflammation associated with the syndrome. It's hard to get enough of this nutrient from your diet, even if you eat vitamin E-rich foods, such as sunflower seeds, almonds, and spinach. That's why I recommend supplements. A daily dose of 200 IU of natural vitamin E should cover your bases, regardless of your state of health.

Did You Know?

- A review of 19 studies found that aerobic exercise slightly delayed and improved symptoms of Alzheimer's.
- Flu and other acute respiratory infections dramatically increase heart attack risk.
- Checkmate is derived from a Persian term meaning "the king is dead."
- Just one cigarette per day significantly increases risk of heart disease and stroke.
- A British study suggests that fortifying more foods with vitamin D would save lives and reduce healthcare costs.
- Substituting standing for sitting six hours a day could result in a weight loss of 5.5 pounds in a year.
- Capillary diameter ranges from 5–10 microns; human hair averages 100 microns.
- Women with PCOS who took resveratrol had 22–23% reductions in testosterone and DHEA and a 66% increase in insulin sensitivity.
- The average age of menarche (first period) in the US is 12½, compared to 16–17 a century ago.
- A recent survey revealed that 19-year-olds are as sedentary as 60-year-olds.
- Caffeine boosts endurance and performance best when used only prior to athletic events, not on a daily basis.

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