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## Coffee: For most, it's safe

By Harvard Health Publications

**Coffee has been blamed for everything from moral turpitude to cancer. But none of the bad raps have stuck. Coffee may even be good for you.**

Despite 20 years of reassuring research, many people still avoid coffee\* because they worry about its health effects. Their concerns are understandable. Older studies had linked coffee to a range of health problems, including pancreatic cancer and heart disease. But this early research didn't take into account the real culprit: cigarette smoking, which was once a common habit of many coffee drinkers. We now know that in moderation — that is, a few cups per day — coffee is a safe beverage. New research suggests it even offers some health benefits.

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Coffee isn't totally innocuous. Its main active ingredient, caffeine, is a mildly addictive stimulant. Getting too much may give you the jitters, keep you awake, and make you irritable. If you're a regular coffee drinker and miss your morning dose, you may get a splitting headache. Some people develop indigestion, stomach problems, or other intestinal distress when they drink coffee. And inconclusive research suggests that high doses of coffee can contribute to bone loss. But for most people, coffee in moderation is harmless.

If you don't enjoy coffee or it bothers you, don't drink it. But if you consider it one of life's pleasures, a rundown of some of the latest findings on coffee's health effects may assuage your concerns.



In 1674, women, who weren't allowed in London coffeehouses, petitioned to ban coffee, claiming it made their men impotent.

### Cardiovascular effects are modest

Coffee has several cardiovascular effects.

**Constricted arteries.** The caffeine in a cup of coffee can constrict arteries that lie in areas away from the heart and lungs, such as the brain. This is one reason drinking a cup of coffee sometimes relieves a throbbing headache caused by dilated blood vessels in the brain. It's also why caffeine is added to several over-the-counter analgesics.

**Increased heart rate.** In some people, coffee can slightly speed the heart rate.

**Increased blood pressure.** A cup of coffee temporarily boosts blood pressure, in much the same way as

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an activity such as climbing stairs does. But a coffee habit doesn't cause chronic high blood pressure. And several studies have found that blood pressure changes tend to occur only in people who don't usually drink coffee.

**Irregular heartbeat.** The American Heart Association says that caffeine (which is also found in tea, some soft drinks, and chocolate) may cause an occasional irregular heartbeat. If you think coffee affects you this way, slowly cut back on the amount you drink each day, and talk to your clinician.

### Staying alert with coffee

Many of us like to drink a cup or two of coffee in the morning to get going, and perhaps take another cup in the afternoon. But research suggests that you'll stay more alert, particularly if you're fighting sleep deprivation, if you spread your coffee consumption over the course of the day. For instance, if you usually drink 16 ounces in the morning, try taking a 2–3 ounce serving every hour or so.

**Increased cholesterol levels.** The coffee oils kahweol and cafestol can increase levels of total and LDL (bad) cholesterol. Paper filters trap these compounds, so they're not found in most cups of coffee in America, and are a problem only for those who drink espresso, pressed, boiled, or other unfiltered coffee.

**Homocysteine.** Several studies have linked coffee consumption to increased levels of homocysteine, a substance in the blood that may increase the risk for heart disease. A Dutch study found that while caffeine alone (the amount in 4 cups of strong coffee) raised homocysteine levels by 5%, getting that amount in coffee more than doubled the effect. This suggests that compounds other than caffeine are involved. But high homocysteine levels are also associated with some nutritional deficiencies (such as low folate). In one study, coffee had no effect on homocysteine levels in people who ate a healthy diet.

**Heart disease.** The American Heart Association has concluded that moderate coffee use (which it defines as 1–2 cups per day) is not harmful. And large, long-term studies (including Harvard's Nurses' Health Study) have found that drinking even as many as 5–6 cups of coffee a day doesn't increase the risk for heart disease.

### Caffeine content of some foods and beverages

Product	Range (mg)	Typical (mg)
Coffee, 8 oz, drip-brewed	80–240	100
Coffee, decaffeinated, 8 oz	2–4	3
Espresso, 2 oz	60–100	80
Tea, 8 oz, brewed, domestic	20–90	40
Tea, 8 oz, imported	25–110	60
Caffeinated soft drinks, 12 oz	22–55	36
Chocolate milk, 8 oz	2–7	5
Semisweet chocolate, 1 oz	5–35	20

**Sources:** Various. The amount of caffeine in foods and beverages varies widely.

A potentially fatal oral dose of caffeine is estimated to be 10–14 grams (10 grams = 10,000 mg). **Source:** Institute of Medicine (2001),

**Caffeine for the Sustainment of Mental Task Performance.**

### For women only

Many women, particularly those of childbearing age, wonder whether coffee and other caffeine-containing foods and drinks are safe for them. Fortunately, there's plenty of scientific evidence about the effects of coffee and caffeinated beverages on women's health.

**Fertility.** There's no credible evidence that caffeine lowers a woman's fertility.

**Pregnancy.** Although the evidence is somewhat mixed, low caffeine consumption (1–2 cups per day) appears to be safe during pregnancy. Most of the studies that have linked caffeine to miscarriage, birth defects, or low birth weight have either not taken into account other factors, or involved higher levels of caffeine or coffee consumption (more than 300 mg of caffeine, or more than 3 cups of coffee, per day). A 2003 Danish study published in the **British Medical Journal** found that pregnant women who drank 4 or more cups of coffee per day were at increased risk of stillbirth. Most authorities, including the FDA, the March of Dimes, and the American College of Obstetricians and Gynecologists, agree that pregnant women should limit their consumption of caffeine to the equivalent of no more than 1–2 cups of coffee (about 100–200 mg of caffeine) per day.

**Breast health.** Some women believe that abstaining from coffee and caffeinated beverages alleviates the symptoms of fibrocystic breast disease (a condition of benign lumps in the breast). The available research does not support this association.

**Cancer.** Over the years, some flawed studies have linked caffeine and coffee to several cancers, including cancers of the breast and ovaries as well as the pancreas and bladder. More thorough investigations carried out during the 1990s have found no connection between coffee and cancer. The American Cancer Society has concluded that caffeine is not a risk factor for cancer.

**Osteoporosis.** Although caffeine can increase urinary excretion of calcium, the jury is still out on whether it's a factor in osteoporosis. Some studies, including Harvard's Nurses' Health Study, suggest that drinking 4 cups or more per day can contribute to bone loss and hip fracture. On the other hand, one study of lifetime coffee drinking (amounting to 2 cups per day) found no evidence of bone loss in women who also drank at least 1 cup of milk per day. Until we know more, it's best to avoid heavy coffee consumption. Women who regularly drink coffee and caffeinated beverages should also be sure they get adequate calcium (1,000–1,200 mg per day) from food and supplements.

How sweet the coffee's taste is,

Sweeter than a thousand kisses,

Milder than sweet wine!

#### **From Coffee Cantata**

by J.S. Bach, 1732

#### **Possible benefits**

Most studies investigating the health effects of coffee or caffeine consumption have focused on possible harms. But some large investigations have identified several potential benefits from coffee drinking.

**Diabetes.** The risk for type 2 diabetes is lower among regular coffee drinkers than among those who don't drink coffee. In two studies, Harvard researchers found that women who drank 6 cups or more per day reduced their risk for type 2 diabetes by 30% (**Annals of Internal Medicine**, Jan. 6, 2004). This result is particularly significant because the studies tracked a total of 125,000 men and women for a dozen years or more. Similarly, Finnish scientists following nearly 15,000 men and women, ages 35–64, found that women who drank 3–4 cups per day had a 29% lower risk for diabetes, and drinking 10 or more cups per day lowered the risk even further (**Journal of the American Medical Association**, March 10, 2004). But no one is recommending that women drink 10 cups a day, or even more than 3 or 4 cups. Not enough is known about its other effects at high doses. We know that it may be harmful in some circumstances, including pregnancy.

**Gallstones.** A Harvard study found that women who drink 4 cups of coffee per day have a reduced risk of developing gallstones. Coffee may alter the metabolism of bile acids, which trigger the formation of the cholesterol crystals that become gallstones. Coffee also stimulates gallbladder contractions, which may curb stone formation.

**Colon cancer.** Several studies have found a reduced risk of colon cancer in people who drink 4 or more cups of coffee per day, compared with those who rarely or never drink coffee. In 2003, German researchers reported that they identified an antioxidant in coffee called methylpyridinium, which boosts the activity of enzymes that may discourage the development of colon cancer. The compound is found in both regular (caffeine-containing) and decaffeinated coffee.

**Cognitive function.** Research involving older men and women participating in the Rancho Bernardo Study found that lifetime coffee intake is associated with better performance by women (but not men) on several cognitive tests. No relationship was found between cognitive function and decaffeinated coffee consumption.

**Performance.** Caffeine has been shown to improve endurance performance in long-duration physical activities such as running, cross-country skiing, and cycling. Studies suggest this effect occurs at doses of 2–9 mg of caffeine per 2.2 pounds of body weight. This is about the amount of caffeine found in 2–5 cups of coffee.

**Liver disease.** Researchers at the National Institute of Diabetes and Digestive and Kidney Diseases have found a strong association between coffee drinking and a reduced risk for liver damage in people at high risk for liver disease. This includes heavy drinkers of alcohol, people with hepatitis B or C, and those with iron overload disorders, such as hemochromatosis. The highest consumption, more than 2 cups of coffee per day, was correlated with the greatest benefit.

**Parkinson's disease.** Several large studies have shown a reduced risk for Parkinson's disease in coffee drinkers. Although most of the data come from research in men, a 2001 Harvard School of Public Health study found that women who consumed 1–3 cups of coffee per day had a 50% reduction in risk for Parkinson's disease, with no increased benefit at higher levels of intake.

### Coffee: A history of controversy

Coffee consumption originated in early Ethiopia, swept through the Muslim world in the 16th century, and quickly invaded Europe, where coffeehouses sprang up to accommodate a burgeoning passion for the exotic beverage. Physicians warned of alleged ill effects including stillbirth, sterility, and paralysis. Worried about a breakdown in social and moral values, political and religious leaders of the day periodically tried to quash enthusiasm for the addictive drink. But people remained smitten. In 1732 in Germany, Johann Sebastian Bach spoofed the controversy in his "Coffee Cantata," in which a strict father tries to persuade his strong-willed daughter to abandon her 3-cup-a-day habit. (To hear a sample of the cantata, courtesy of National Public Radio, go to [www.npr.org/programs/morning/features/patc/coffeebreak](http://www.npr.org/programs/morning/features/patc/coffeebreak) and click on the appropriate "listen" button.)

Those who view their morning coffee as a guilty pleasure can banish their misgivings. The latest research discounts the notion that moderate coffee consumption — which we interpret to be about 2–4 cups per day — causes significant or lasting harm. Indeed, some studies suggest that coffee and caffeine may offer some real health benefits.

\* Unless otherwise indicated, "coffee" refers to coffee containing caffeine, not to decaffeinated coffee.

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