What every dentist should know about coffee

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Coffee is one of the most widely consumed beverages throughout the world. Its stimulating nature is responsible for much of its popularity, which paradoxically has resulted in its reputation for negative effects on consumer health. This review will address recent research on the systemic and dental health effects of coffee. Many of its supposed harmful effects have been disproved, while many protective and beneficial roles for coffee are emerging.

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The history of the coffee plant can be traced back to Ethiopia in the 10th century. Despite its long history, the first record of coffee consumption was in 15th century Yemen. From there, coffee spread throughout the Middle East, eventually reaching as far as northern Africa and the horn of Africa. In the late 1500s, a German physician and traveler introduced coffee to Europe. The coffee plant was then transported to the Caribbean in the early 18th century. Throughout the 16th-19th centuries, more than 1 million African slaves were taken to Cuba, where they were forced to cultivate coffee plants while enduring prison-like conditions.

Meanwhile, in the British colonies that would become the United States, the Boston Tea Party shifted coffee consumption habits. Tea drinking was suddenly viewed as “un-American,” and coffee quickly rose in popularity in the late 1700s. Since then, coffee has become ubiquitous and can be purchased in cafes, restaurants, and grocery stores.

Coffee and its role in dentistry
A dentist’s immediate and automatic response to a patient’s coffee drinking habit might be negative. After all, coffee has long been recognized for its detrimental role in discoloration of enamel and resin restorative materials. However, despite its unfavorable effects on esthetics, coffee may provide more dental benefits than originally recognized. One study determined that coffee drinking is not harmful to the periodontium and could have a protective effect.

More recently, researchers found that green coffee has antibacterial properties against periodontal pathogens.

Systemic benefits of coffee
In addition to the emerging research in the dental field with respect to coffee, substantial research suggests an important role for coffee and caffeine in systemic health. As frequently visited healthcare providers, dentists have a unique opportunity to educate their patients about the potential systemic benefits of drinking coffee.

Protecting the liver
The liver is widely known for its roles in detoxification and regulation of blood glucose and lipid levels. Approximately 3 million Americans are afflicted with chronic liver disease with a variety of etiologies, including hepatitis C virus, excessive alcohol consumption, and obesity. A previous epidemiologic study showed that the risk of death by liver cirrhosis dropped by 23% with each additional cup of coffee consumed. Alanine aminotransferase levels, a marker for liver damage, were also shown to have an inverse relationship with coffee consumption in a study comparing populations at high risk for liver injury. People who consumed at least 2 cups of coffee per day were 56% less likely to experience elevated alanine aminotransferase activity than were those who were not coffee drinkers. These results were consistent...
throughout all etiologies of liver disease. In specific studies of viral hepatitis, caffeine—from coffee in particular—was shown to be inversely related to the frequency of developing liver fibrosis. Similar studies were conducted in patients with fatty liver disease; individuals who averaged about 2 cups of coffee per day were less likely to progress to advanced stage fibrosis.

Coffee also has been shown to have a strong protective effect against liver cancer. A recent European prospective study found that people who drank about 3½ cups per day were 72% less likely to develop hepatocellular carcinoma than people who drank very little coffee (less than ½ cup per day). The study followed approximately 500,000 men and women for 11 years, during which 201 people developed hepatocellular carcinoma. These results were so striking that some physicians have suggested “prescribing” coffee to patients with chronic liver disease.

**Boosting metabolism**

Metabolic syndrome is a combination of at least 3 of the following: abdominal obesity, elevated blood pressure, elevated fasting glucose, high serum triglycerides, and low levels of high-density lipoprotein. The condition is associated with an increased risk for cardiovascular disease and type 2 diabetes. A study in Japan found that the frequency of developing metabolic syndrome is inversely associated with the amount of coffee consumption. After adjusting for variables such as age, alcohol consumption, smoking, and exercise, the researchers determined that men who drank 4 cups or more of coffee per day were 39% less likely to develop metabolic syndrome.

A systematic review of many prospective studies determined a dose-dependent effect of coffee on the development of type 2 diabetes. People who drank just 2 cups of coffee per day were at a 15% lower risk for developing type 2 diabetes, while people who drank up to 6 cups were at a 33% lower risk. Moreover, the study found that decaffeinated coffee was also protective against diabetes. Several animal studies have shown that both caffeinated and decaffeinated coffee can increase lipid metabolism; however, the effects of coffee on human metabolism are still unclear.

**Keeping the mind sharp**

A prospective study determined that men who consumed about 4 cups of coffee per day were 25% less likely to develop Parkinson disease, a disorder of the central nervous system affecting motor function. Women were 40% less likely to develop the disease. Caffeine is a known adenosine receptor antagonist, which may serve a role in protection of dopaminergic neurons. Caffeine consumption is also inversely correlated with cognitive decline related to aging. A study reported that elderly women who consumed 3 cups of coffee per day experienced fewer white matter lesions. This is also likely due to caffeine’s role as an adenosine receptor antagonist, which has been shown to prevent damage from amyloid-β in Alzheimer disease.

**Decreasing the risk of cancer**

In a study of European women, drinking 3 cups of coffee per day lowered the risk of uterine cancer by 19%. There has also been evidence of coffee’s protection against oral and pharyngeal, colon, prostate, bladder, endometrial, pancreatic, leukemic, and breast cancers. Chlorogenic acid, a key polyphenol present in coffee, acts as an antioxidant and repairs DNA. These mechanisms may explain coffee’s protective effect against colon cancer. Kahweol, a diterpene found in coffee, also takes on an anticancer role, as it has been shown to inhibit angiogenesis, a critical step in the progression of numerous cancers.

**Supporting psychological health**

A prospective study of more than 50,000 American women evaluated the role of coffee in the development of depression. Women who drank 2-3 cups of coffee per day were at a 15% lower risk for depression, and those who drank at least 4 cups were at a 20% lower risk. In addition, some data have shown that the risk of suicide decreases with moderate consumption of coffee.

**Preventing heart disease and strokes**

Caffeine has long been recognized for its acute effect in increasing heart rate and blood pressure; however, its long-term effects on the heart have been brought into question. In fact, chronic coffee consumption may actually result in a decreased risk for heart disease. A large prospective study discovered a negative association between coffee consumption and mortality due to heart disease and stroke. The polyphenols present in coffee may help prevent the formation of blood clots, and the chlorogenic acids may decrease blood pressure.

**Improving kidney function**

Although coffee is a known diuretic due to its high levels of caffeine, it also can improve kidney function. A study in Japan compared the effects of coffee and green tea on the kidney. It was found that drinking 3 cups of coffee per day increased the efficiency of kidney filtration. Lower filtration efficiencies are associated with progressive kidney damage and potential failure. These protective effects on the kidney were not observed with green tea consumption.

**Maintaining intestinal health**

Coffee seems to increase intestinal levels of bifidobacteria, important members of the colon flora that are often used to treat diarrhea as well as patients undergoing antibiotic therapy. Further research may indicate a role for coffee as a helpful supplement during treatment with antibiotics.

**How do you take your coffee?**

There are a variety of ways to consume coffee, some proving more beneficial than others. The 2 main bean types are Arabica and Robusta. Arabica is more popular but contains more sugar and oil. Robusta has a stronger flavor but contains more caffeine and polyphenols. Roast strength can also affect the chemical contents of coffee. While dark roast may taste stronger, light roast actually retains more of the caffeine and polyphenols. Brewing drip coffee may be the healthiest option. The coffee filters keep out the bad oils in coffee that can raise cholesterol. Unfortunately, the filters also remove antioxidant lipids like kahweol.

If possible, it is best to avoid adding sugar, as that would counteract any beneficial metabolic effects of coffee. The addition of milk dilutes the coffee but is a good source of calcium and protein. A recent US government report has stated that 3-5 cups per day is a safe amount of coffee intake and enough to reap all the potential benefits.
The downsides of coffee
Caffeine is a known addictive substance, and withdrawal can cause problems such as headache, fatigue, and irritability. In addition, caffeine affects circadian rhythm, resulting in sleep disturbances. Caffeine in an amount of 200 mg, equivalent to about an 8-oz cup, can delay a person’s circadian rhythm by 40 minutes, as measured by melatonin levels. Of course, caffeine’s effects are individual, largely based on weight and current tolerance to the stimulant.

Its stimulant effects can cause jitteriness and short-term tachycardia and arrhythmias, which could be dangerous for patients with cardiac problems. Furthermore, some data link caffeine and coffee to miscarriages in women. Pregnant women should be advised against high levels of coffee consumption.

A healthy vice
The addictive, stimulating nature of caffeinated coffee has previously resulted in scrutiny of its health effects. However, accumulating research suggests otherwise, and coffee has emerged as one of the latest superfoods. Coffee’s new reputation surpasses trendsiness, and dentists can recommend moderate coffee consumption (up to 5 cups per day) to their patients.

Coffee serves a strong protective role against liver fibrosis, cancer, heart disease, and stroke. Its metabolic effects may decrease the risk of developing diabetes. Coffee also has many beneficial effects on neurologic functions. It has been shown to decrease the risk of Parkinson disease and depression, and its consumption is inversely related with cognitive decline. Coffee may even enter the market as a new supplement for patients taking antibiotic therapy.

However, it is still important to warn against potential risks, such as sleep disturbances and risks of miscarriages, as well as any negative influence on dental esthetics, namely the risk of enamel and resin staining. For most people the potential benefits outweigh the risks. Current coffee drinkers can sip their morning brew with satisfaction—their vice may be prolonging their life.

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References


