

Secondary Smoke Carries High Price

Scientists have taken the guesswork out of determining how much damage secondary, or passive, cigarette smoke does to a person's arteries. It's about 40 percent as much as smoking does, a new study finds.

The research has also turned up bad news for former smokers, even those who don't breathe any secondary smoke. People who kick the habit seem to continue adding to the arterial damage they incurred while smoking.

Make no mistake—quitting is still a good idea, says study coauthor George Howard, an epidemiologist at Wake Forest University in Winston-Salem, N.C. Other negative cardiovascular effects of smoking cigarettes—such as damage caused by carbon monoxide or blood vessel spasms brought on by nicotine—begin to dissipate promptly in the weeks and months after quitting.

Unfortunately, smoke inhalation—intentional or not—also produces effects that persist in the form of arterial plaques and may be irreversible, Howard says. This thickening of arterial walls, known as atherosclerosis, can lead to heart disease. Studies in Finland in 1991 and the Netherlands in 1997 found a direct correlation between thickening of the walls of the carotid artery—the large vessel in the neck that carries blood to the brain—and heightened risk of heart attack.

From 1987 to 1989, Howard and his colleagues examined 10,914 people between the ages of 45 and 65 in Maryland, Minnesota, Mississippi, and North Carolina. They retested the participants 3 years later, measuring the thickness of each person's carotid artery wall.

The researchers sorted out smokers, nonsmokers, and past smokers and differentiated nonsmokers who were exposed to secondary smoke from those not exposed to smoke. After accounting for differences in demographics, diet, and lifestyle, the team found—not surprisingly—that arterial plaque builds up 50 percent faster in smokers than in people who had never smoked.

However, people who didn't smoke but reported being in close contact with a smoker for at least 1 hour per week experienced 20 percent more vessel thickening, on average, than nonsmokers who didn't breathe any cigarette smoke. This figure is considerably higher than many researchers had expected.

"It's like being a light smoker, and that's very bad," says Stanton A. Glantz, a cardiovascular researcher at the University of California, San Francisco.

Atherosclerosis accounts for roughly 70 percent of all ailments traceable to

secondary smoke, Glantz adds.

Howard and his colleagues were shocked to find that participants in the study who had quit smoking nonetheless underwent a faster-than-usual thickening of their arterial walls during the 3 years of the study. While some increase with age is natural, these people sustained a 24 percent greater increase in vessel wall thickness than did nonsmokers who were not exposed to secondary smoke.

The rate of arterial thickening was proportional to how heavily a person smoked in the past, the researchers found.

"Previous smoking could have started [an atherosclerotic] process that has some continuance," says Thomas A. Pearson, a preventive cardiologist at the University of Rochester (N.Y.) School of Medicine.

The data also show that atherosclerotic

effects of smoking and breathing secondary smoke were especially bad for diabetics and people with high blood pressure.

The researchers, whose work appears in the Jan. 14 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, measured the thickness of the carotid artery wall with ultrasound devices. They examined more people than any previous study of this kind, Pearson says.

"This is stronger evidence," he concludes.

As of 1995, 24.7 percent of U.S. adults, or 47 million people, were smoking cigarettes, the federal Centers for Disease Control and Prevention reported in the Dec. 26, 1997 MORBIDITY AND MORTALITY WEEKLY REPORT. Recent studies attribute between 30,000 and 60,000 deaths each year to secondary smoke. —N. Seppa

Female flies pick mates with sexy eyes

Among some species of stalk-eyed flies, the guy with the longer eye stems gets the girl.

That alluring length has turned out to be one of the few documented cases in which a flamboyant male ornament, like the peacock's tail, indicates superior genes, says Gerald S. Wilkinson of the University of Maryland, College Park. In the Jan. 15 NATURE, his team suggests that females of two tropical species in the *Diopsidae* family may not be so silly when they yield to the dazzle of stalks that can separate a male's eyes by up to one and a half times his body length.

In the wild, the flies stop grazing in the evening, and males stake out rootlets dangling from stream banks. On a disputed rootlet, males face off eye to eye, and the one with the shorter span usually flees. Challengers with similar eye stalks wrestle for the root. Females cruise the bank of fighting males, and a particularly enticing male can mate with as many as 24 partners in half an hour.

The hidden benefit of going for the long-eyed males, Wilkinson suggests, is that these heartthrobs carry a tough Y chromosome that increases a female's chances of having sons, which are XY. In these fly populations, more sons means more grandchildren.

In the wild, female flies outnumber males by roughly 2 to 1. Wilkinson attributes the skew to a so-called selfish form of the X chromosome, which sabotages regular Y's during sperm formation. The preponderance of X-bearing sperm results in an abundance of daughters.

However, he predicted that the Y chromosome in long-eyed males can resist the selfish X and so create an unusual number of sons. In the largely female fly world, a mom who produces males has the best chance of spreading her genes wide in future generations.

In the laboratory, the researchers allowed only the males with the longest eye stalks to breed. After 22 generations, the males had even more impressive stalks, and the sex ratio had shifted to a surplus of males—suggesting a link between stalk length and more persistent Y chromosomes.

"Whether this is a freaky thing or common is too soon to say," Wilkinson notes.

Michael J. Ryan of the University of Texas at Austin calls the notion that outrageous male ornaments signal good genes "a very intuitively pleasing argument," but, he laments, "there's only a handful of demonstrations." —S. Milius

Horizontal stalks support the eyes of flies in the Diopsidae family. Females of some species prefer males with long eye stalks, who also offer superior genes.

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