Biomedicine

Smoking worsens menstrual pain

Die-hard smokers claim a cigarette relaxes them, alleviates tension, and makes them feel better. But new research from the University of Milan suggests that this temporary relief may cause dysmenorrhea, or in laywoman's terms, killer cramps.

The study, published in the July EPIDEMIOLOGY, looked at 251 women age 15 through 44—106 with menstrual pain and 145 without—over an 18-month period. The trial excluded women with previous dysmenorrhea, fibroid tumors, ovarian cysts, or endometriosis, all of which can contribute to the severe pelvic pain identified by the authors. The investigators had no way of determining whether or not a woman developed endometriosis during the study: A laparoscopy, the "belly-button cut," is the only sure way to confirm the presence of the disease.

Women who smoked 10 to 30 cigarettes a day doubled their risk of dysmenorrhea, compared to nonsmokers. And women who had smoked for 10 to 20 years nearly tripled their risk.

Smoking is a known vasoconstrictor—it narrows blood vessels and reduces blood flow. According to Laura Luchini, one of the report's authors, this might explain some of the dysmenorrhea. As in the rest of the body's blood vessels, she says, "the endometrial blood flow reduces in smokers." In addition, she says, "Women with heaviest menstrual flow have greater risk of dysmenorrhea."

The researchers also confirmed a palliative for cramps that many women have already discovered themselves: alcohol.

Devotees of the grape will be pleased to know that wine lessens the pain. Women who consumed 8 to 28 glasses a week (an amount more acceptable in Europe than in the United States) had half the risk of dysmenorrhea as the teetotalers. Beer, however, showed no such association.

"We did not find these results in other studies," says Luchini. "We should look to these results with caution."

Cancer protection: Regular or decaf?

In previous studies, green tea proved an effective cancer inhibitor in mice (SN: 8/31/91, p.133). Now, a group of researchers reports on the anticancer potential of green tea, black tea, and their decaffeinated versions. In female hairless mice, the caffeinated blends offer more protection against skin cancer, the team reports. In addition, black tea works as well as the green.

The findings, published in the July 1 CANCER RESEARCH, identify the antioxidant (-)-epigallocatechin gallate (EGCG) as the chief cancer fighter in green tea. As postulated in earlier studies, EGCG is believed to guard against tumors by attacking free radicals—highly reactive molecules or molecular fragments that can damage healthy DNA.

According to Zhi Y. Wang of Rutgers University in Piscataway, N.J., all of the teas—green and black, regular and decaf—display antioxidant properties, though Wang believes too much focus has been placed on green tea, which contains more EGCG than black tea.

"We found black tea is comparable with green tea," Wang says. "We don't know why."

It may be, he theorizes, that the two teas share some important chemistry. Indeed, both are made from the same leaf. But in black tea, a fermentation process produces the stronger, woody flavor.

Wang says that black tea, though more chemically complex, should be studied further. Indeed, of the 2.5 million metric tons of tea produced worldwide, 78 percent is black tea.

Wang also says that the caffeinated teas have a slight edge over decaffeinated versions in terms of cancer protection.

Earth Science

Into every life some UV must fall

Sunlight's ultraviolet (UV) radiation can do damage. Over time, too much UV can cause premature aging (wrinkles and liver spots), skin cancer, and cataracts and perhaps impair the immune system. For years, health workers have urged people to avoid overexposure by staying out of the sun as much as possible and by wearing sunblocks, sunglasses, hats, and ample clothing.

Now, the National Oceanic and Atmospheric Administration and the Environmental Protection Agency offer the Experimental Ultraviolet Index. On June 28, NOAA added this index—a prediction of UV radiation levels—to the National Weather Service's (NWS) daily forecasts for 58 U.S. cities. NWS meteorologists use satellite and ground-based observations and computer models to forecast the UV level at its peak—noon standard time (1 p.m. daylight savings time). The 15-point index corresponds to five exposure categories set by EPA; a reading between 0 and 2 is considered "minimal," while a reading of 10 to 15 is termed "very high."

Exposure Categories/ Index Values		Minutes to Burn for "Never Tans" (most susceptible)	Minutes to Burn for "Rarely Burns" (least susceptible)
Minimal	0-2	30 minutes	>120 minutes
Low	4	15 minutes	75 minutes
Moderate	6	10 minutes	50 minutes
High	8	7.5 minutes	35 minutes
Very High	10	6 minutes	30 minutes
	15	< 4 minutes	20 minutes

A sampling of index numbers and "burn times" for two skin types.

Actual exposure and risk depend on a number of factors, including the duration and time of exposure (UV rays are only about half as intense 3 hours before or after the peak), physical surroundings (snow, sand, and water reflect more UV and intensify exposure), degree of cloudiness, skin coloration, and latitude and altitude (exposure increases with proximity to the equator and with altitude).

EPA suggests that, when outdoors, people protect themselves against UV light whenever they can see their shadow.

Tangling over Toronto's ozone

Few actions in high-visibility science fail to stir up debate. A case in point: the report last year by two Canadian scientists that they had detected an increase in the amount of harmful ultraviolet (UV) radiation bathing Toronto.

According to James B. Kerr and C. Thomas McElroy of Environment Canada in Downsview, Ontario, total UV radiation in the Toronto area rose 35 percent per year during winter and 7 percent per year during summer between 1989 and 1993. They attributed the increases in part to a drop in stratospheric ozone concentrations above the city of 4.1 percent in winter and 1.8 percent in summer (SN: 12/4/93, p.382).

Now, three environmental scientists from the University of Virginia in Charlottesville challenge these conclusions. Their reanalysis of the Kerr-McElroy winter data indicates that the Canadian findings stem from "an artifact of the [original] analysis," write Patrick J. Michaels, S. Fred Singer, and Paul C. Knappenberger in the May 27 SCIENCE. They assert that the Kerr-McElroy conclusions result from only four UV-B readings (out of 312 used in the original study). "When the four points from March 1993 were eliminated, there was no trend significantly different from zero at any [UV-B] wavelength," the Virginia team says.

In a rebuttal, Kerr and McElroy say the Virginia team erred by using only winter data and by "arbitrarily" rejecting some data. "Perhaps the most serious bias in the analysis by Michaels *et al.* comes from the removal of data points without an apparent physical basis for doing so. . . . Removal of these critical data points is inappropriate," the two argue.