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Coming Clean

Can we solve the problem of carcinogens in the environment?

By Bill O'Driscoll



Healthy concerns: Devra Davis in Washington, D.C.

Last year, at age 45, I joined a growing community: I was diagnosed with melanoma. Melanoma, the deadliest form of skin cancer, is three times as common as it was three decades ago. One in 58 people will get the disease and, according to the Melanoma Research Foundation, it's rising fastest among people under age 30.

Conventional medical wisdom holds that melanoma is caused by exposure to ultraviolet light, and especially severe sunburns early in life. The disease most often strikes fair-skinned, freckled people. I'm not very freckled, but the dermatologist who caught the growth wondered whether more UV rays were reaching our skins through the earth's thinned-out ozone layer.

Then I interviewed Devra Davis, an epidemiologist and author. "Sunlight is a cause of melanoma, but it's not the only cause," she said. And she didn't just mean tanning beds, another risk factor.

Davis, who heads the Washington, D.C.-based Environmental Health Trust, said melanoma had been linked to PBDEs -- fireproofing chemicals found in things like beds and office furniture. She mentioned Swedish studies that have found elevated melanoma levels in nurses and bank tellers, suggesting unknown occupational hazards. And she asked about my exposure to household pesticides and solvents.

In medicine, Davis' thinking is unconventional: Except for smoking, doctors typically discount pollution and chemicals in consumer products as causes of cancer. And our attention and research dollars lean heavily toward treating cancer, rather than preventing it.

But with cancer about 50 percent more common today than when President Nixon launched our "war on cancer" in 1971, there's mounting evidence of how such contaminants affect our health -- and a few ideas what to do about it.

Tiny Exposures, Mysterious Effects

The scope of the synthetic-chemical problem is huge. The 1976 Toxic Substances Control Act requires the testing of potentially toxic substances. But while there are 84,000 synthetic chemicals in circulation, the vast majority haven't been fully tested for health risks, and only a handful have been banned. There's not even a complete ban on known carcinogens like asbestos. Yet as critics like Davis have pointed out, it's not up to industry to prove its chemicals are safe -- it's effectively up to everyone else to prove that they're dangerous. And with everyone exposed to hundreds of chemicals daily, that's a much tougher proposition.

Indeed, the more researchers learn, the thornier their questions become.

One problem is that big doses of a chemical aren't always necessary to create big problems. Even tiny exposures can have huge effects, depending on when the exposure happens.

Take breast cancer. A 2011 University of Buffalo study found that women's DNA can be altered by exposure to air pollution when they are young and when they give birth to their first children. That alteration increases the mother's risk of premenopausal breast cancer. And while the pesticide DDT doesn't appear to be a factor in breast cancer among *adult* women, a 2007 study found increased risk of breast cancer in women who were under age 14 when DDT usage peaked.

Special risks may apply to fetuses and children, who break down and purge chemical invaders more slowly than adults.

"There is building evidence that [exposures] early in life are affecting health over the entire life course," said Frederica Perera, director of Columbia University's Columbia Center for Children's Environmental Health, speaking in Pittsburgh last June.

One example involves a chemical known as DES, a synthetic estrogen widely prescribed to ease pregnancy discomforts from the 1940s through the '60s. According to a new National Cancer Institute study, the women who took DES didn't necessarily get sick. But their daughters did: Years later, they proved 40 times more prone to a rare form of vaginal cancer. They also had increased risk of breast cancer and reproductive problems.

Are there other DES's out there? "Hormone mimics," as ingredients of pesticides, plastics and personal-care products, are today a part of daily life -- a part too little researched, say critics.

Because the chemicals of concern aren't just mutagens -- substances that damage the structure of genes. Researchers are also exploring the *behavior* of genes, or whether they are activated or deactivated. An "oncogene," switched on, can lead to cancer; a cancer-fighting gene, meanwhile, can be shut off, allowing cancer to develop. Many hormone-mimics, researchers say, can throw that off-switch, leaving people vulnerable to cancer and other threats. And such hormone-mimics are found in everything from laundry soap and shampoo to weed killers and prescription drugs.

The Right Chemistry

Some researchers have suggested that nearly all cancers have an environmental component. Still, protecting us from this complex chemical soup would be daunting. As famed medical researcher John Bailar once wrote, "Cancer prevention on a large scale is likely to require substantial changes in our personal habits," as well as "very expensive measures to clean up the environment and the workplace" and other changes, too.

Yet public-health campaigns work. Removing lead from gasoline, for instance, has meant less of it in children's blood ... and higher IQs and fewer developmental problems.

Some measures are already underway. For example, Allegheny County's no-idling rule for trucks, if strictly enforced, would reduce emissions of benzene, a known carcinogen.

There's also the promise of "green chemistry," the movement to reduce unnecessary usage of petrochemicals and create nontoxic alternatives. But significant progress on that front will likely require government incentives, or mandates requiring industry to change its ways.

One hope is U.S. Sen. Frank Lautenberg's Safe Chemicals Act. The bill would require chemical makers to prove their products are safe for humans and the environment before selling them, rather than pulling them from the market *after* they've been proved harmful. But Lautenberg (D-N.J.) has introduced the act seven years running, and gotten little traction, no doubt partly thanks to a chemical industry that spends \$50 million annually lobbying in Washington.

Rather than continuing to spin our wheels, Devra Davis offers a novel solution.

The formerly Pittsburgh-based epidemiologist and author of such books as *The Secret History of the War on Cancer* notes that the parties best able to judge the threat posed by these chemicals are the companies who make them. But she writes that corporations, fearing lawsuits and diminished profits, have either avoided doing the research or suppressed it. Meanwhile, people fall ill and die from lack of information.

So Davis proposes a "truth and reconciliation" commission on man-made toxins: "If we gave [industry] a free pass to come forward ... [citizens] would then be informed," she says. While this would mean granting amnesty for past chemical releases, instead, "We'd do medical monitoring and surveillance. We'd all be better off."

As for me, I survived my brush with melanoma. Yet because of the big role played in cancer by early exposures -- to UV light, pesticides and who knows what else -- I might not avoid a recurrence, no matter how carefully I shun the sun.

But what if we did get serious about prevention, and especially about cleaning up our toxic environment? Maybe one of the tumors we'd prevent has your name on it.

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