Chemicals combine in our bodies, but are rarely tested that way. Why?

Multiple exposures pose unknown risks.

A good pharmacist will alert you that a newly-prescribed medicine may adversely interact with some other medicine you're already taking. That is, two medications that are individually benign can cause problems in combination. Careful studies have been undertaken to identify those drug interactions.

But when it comes to toxic chemicals in everyday products, there is surprisingly little information available about how they behave in combination. How, for example, are our bodies affected when the chemicals in paint thinners interact with those in dark hair dyes, or when we are exposed to one pesticide on a fruit, and another from our neighbor's lawn?

What We Know

Here is an analogy: Compared with non-smokers, cigarette smokers have ten times the risk of contracting lung cancer. We also know that workers exposed to asbestos have five times the lung cancer risk compared with those never exposed. You might think, therefore, that smokers exposed to asbestos would have 15 times the risk of getting lung cancer. In fact, they face 55 times the risk. A powerful interaction.

We know that the tissue of nearly every human on earth contains detectable levels of a range of chemicals called persistent organic pollutants or POPs. We find POPs in pesticides, industrial chemicals, indeed in a broad range of products introduced over the past sixty years. We know that occupational exposure to PCBs, dioxin, and other POPs has been linked to several cancers and to a broad range of reproductive problems, including birth defects in offspring. Clinical and epidemiological studies suggest that non-occupational exposures to POPs at much lower levels may also cause significant harm, especially to developing fetal organs. And the little we know of exposure to a multiplicity of these chemicals should cause concern.

Dutch scientists have documented that when PCBs, at a non-toxic level, are mixed with dioxin, at a level that produced only minor liver damage, the combination produced 400 times the damage of the dioxin alone.

A study at Tufts University tested the effects of 10 pesticides which mimicked estrogen in the body. At low levels, none of the pesticides alone had an effect on human tissue. But in various combinations, there was a strong estrogen-mimicking effect ... even at low levels.

In a study at the University of Wisconsin, mice showed no effect when exposed to atrazine or aldicarb, two pesticides commonly found in drinking water in the Midwest. When mice were exposed to both chemicals, as humans often are, the combination produced immune system impairment.

What We Can Do

Parents should limit their children's exposure to pesticides, both in and outside the home. Organically produced foods should be purchased whenever possible. The use of paints, solvents, and cleaning products containing toxic and volatile chemicals should be limited. There are more suggestions on our website.

But we must do more. Of the thousands of synthetic chemicals on the market, relatively few have been tested for safety. And even fewer have been tested in combination with other chemicals. For our health, for our children's health, such testing should be in place for all chemicals.

A summary of the supporting scientific evidence, and a list of scientific endorsers, can be found at www.childenvironment.org.

Center for Children's Health and the Environment

MOUNT SINAI SCHOOL OF MEDICINE

Box 1043, One Gustave Levy Place, New York, NY 10029 • **www.childenvironment.org**