

How Chemical Exposures Happen: What You Need to Know

Chemicals are found in common materials around us: paints, fuels, cleaning solutions, and solvents.

You may come into contact with chemicals if they are not stored or disposed of properly. This is called chemical exposure. Chemicals can also be released into your environment naturally or through leaks, spills, and man-made disasters. Some chemicals are hazardous—they can harm you. Other chemicals cause no harm. This booklet explains why.



Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation



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How do you come into contact with chemicals?

The place where a chemical is released into the environment, like a leak or spill, is called a source. You can come into contact with a chemical at its source, or air, water, soil, and food can carry chemicals from a source to you.



Air: Most air pollutants come from man-made sources such as factories, power plants, cars, trucks and cigarettes. Some air pollutants come from natural sources, such as forest fires and volcanoes. Air pollution may bother your airways, causing breathing problems. Air pollution can also bother your eyes and skin.

Water: Chemicals found in acids, pesticides, industrial wastes, or animal byproducts can get into the ground and surface water. Chemicals enter the water when rain or water washes them into rivers, lakes, and streams or the ground. Contaminated water can harm humans, animals, and aquatic plants.



Soil: Chemicals, like pesticides, can pollute the soil. Industrial wastes can also be mixed into clean soil—a practice called land-farming—resulting in contaminated soil. Polluted soil can affect the food you grow and eat and the water you drink. Polluted soil can also spread through the air as dust particles. When it rains, these dust particles may settle back into the soil.

Food: Humans can become exposed to chemicals if they eat plants or animals that have come into contact with chemicals or chemical pollutants. Fish from contaminated water may contain unsafe levels of chemicals.



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Will you get sick if you come into contact with a chemical?

Some chemicals cause harm, but many do not. People's bodies respond to chemicals differently. Some people may get sick from an exposure to a chemical while others may not.

The healthier you are, the better your body can protect you. Other factors that play a part in whether you may get sick include

- The type of chemical you were exposed to,
- The amount of a chemical you were exposed to,
- How long the contact lasted,
- How often you came into contact with a chemical,
- How the chemical entered your body, and
- Your health.

How do chemicals get into your body?

To be exposed to a harmful chemical, you must breathe, eat, drink, or touch it.

- **Breathing (or inhalation):** Chemicals are found as gases, vapors, aerosols, and fibers that you breathe in with air. When chemicals reach the lungs, they can affect the lungs directly or travel to other parts of the body through the blood stream.
- **Eating and drinking (or ingestion):** Food or drinks may have chemicals on or in them that can enter your body. These chemicals are absorbed, or taken in, by the digestive system.
- **Touching:** You can have contact with chemicals through your skin or eyes.
 - » Chemicals can enter your bloodstream through the pores, small cracks, or cuts in your skin. Other chemicals may just irritate or burn your skin, exposing it to infection.
 - » Some chemicals may burn or irritate your eyes. Some chemicals may enter your body through the eye.

Remember:

For a chemical to make you sick, it must first enter your body.

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You can reduce your contact with chemicals by

- Being aware of chemicals in everyday products;
- Being aware of any contamination or pollution around your home or work;
- Washing your hands;
- Washing fruits and vegetables;
- Reading labels that warn you about chemical exposure;
- Not burning treated wood;
- Following proper disposal guidelines for electronics, batteries, paint, and other chemical-containing products;
- Avoiding exposure to cigarette smoke; and
- Limiting how much high mercury fish you eat and following local fish advisories. Remember that eating fish low in mercury is part of a healthy diet.

If someone breathes, eats, or drinks harmful chemicals that are poisons, you should take immediate action. For a poison emergency in the United States, call 1-800-222-1222.

For more information on poison emergencies, visit <http://www.poison.org>. To find your local poison control center, visit the Web site of the American Association of Poison Control Centers at <http://www.aapcc.org>. Chemical manufacturing companies may also have their own hotlines.

For information about chemicals or other environmental health topics, please call the Agency for Toxic Substances and Disease Registry Information Center, toll-free, at 1-800-232-4636; or visit our Web site at <http://www.atsdr.cdc.gov>.

Sources:

Conant J, Fadem P. A community guide to environmental health. Berkeley, CA: Hesperian; 2008.

World Health Organization. Hazardous chemicals in human and environmental health. Geneva: World Health Organization; 2000.

The Agency for Toxic Substances and Disease Registry (ATSDR), based in Atlanta, Georgia, is a federal public health agency of the U.S. Department of Health and Human Services. ATSDR partners with communities across the nation to increase knowledge about toxic substances, reduce the health effects of toxic exposures, and protect the public health.