

Health Effects of Chemical Exposure

You come into contact with chemicals every day.

This is called chemical exposure. Although some chemical exposures are safe, others are not. A certain amount of a harmful chemical must enter your body to make you sick. Harmful chemicals can get into your body if you breathe, eat, or drink them or if they are absorbed through your skin. This booklet explains some links between chemicals and other harmful substances and their possible health effects.

People respond to chemical exposures in different ways. Some people may come into contact with a chemical and never be harmed. Others may be more sensitive and get sick. Sometimes illness happens only if you are exposed to a harmful substance for a long time.

Many factors play a part in whether you get sick from contact with chemicals, including

- The kind of chemical you are exposed to,
- How much of the chemical you were in contact with,
- How long the contact lasted,
- How often you were exposed,
- How it entered your body, and
- Your health.



Health Effects of Some Chemicals on Your Body Systems

The RESPIRATORY SYSTEM's function is to supply oxygen to the body and remove carbon dioxide. It includes the nasal passages, pharynx, trachea, bronchi, and lungs. Possible health effects of the respiratory system include asbestosis, lung cancer, chronic bronchitis, fibrosis, emphysema, and decreased oxygen supply in blood.

Possible Contaminants

Asbestos

Radon

Cadmium

Benzene

Carbon monoxide

Soot

Where do you find these?

Old insulation

The ground

Old batteries

Degreasers

Car exhaust, unvented or faulty furnaces

Furnaces, wood burning stoves

The RENAL SYSTEM's function is to rid the body of waste, to regulate the amount of body fluids, and to regulate the amount of salts in the body. It includes the kidneys, the urethra, the bladder, and the ureter. Possible health effects of the renal system include decreased formation of urine, decreased blood flow to kidney, decreased ability to filter the blood, prevented urine flow, kidney tissue damage, and kidney cancer.

Possible Contaminants

Cadmium

Lead

Mercury

Uranium

Chlorinated hydrocarbon solvents

(TCE, PCE, PCT)

Where do you find these?

Old batteries, cigarette smoke

Old paint, outdated plumbing

Thermostats, thermometers, some fish

Food & water, proximity to nuclear testing sites

Degreasers, paint removers, dry cleaning solutions

The CARDIOVASCULAR SYSTEM's function is to move nutrients, gases, and wastes to and from the body, to help stabilize body temperature, and to fight diseases and infections by transporting white blood cells to important areas. It includes the heart, blood, arteries, veins, and capillaries. Possible health effects include heart failure and the inability of blood to carry the necessary oxygen to the body.

Possible Contaminants

Carbon monoxide

Carbon disulfide

Nitrates

Methylene chloride

Where do you find these?

Car exhaust, unvented or faulty furnaces

Industrial production

Fertilizers

Auto part cleaners, paint removers

The REPRODUCTIVE SYSTEM's function is to produce egg and sperm cells, to nurture a developing fetus, and to produce hormones. For males it includes the testicles, seminal vesicles, prostate gland, and the penis. For females it includes the uterus, bladder, vagina, Fallopian tubes, ovaries, and the cervix. Possible health effects of the reproductive system include decreased ability to have a baby, increased baby deaths, increased birth defects, and infertility (the inability to have children).

Possible Contaminants

Methyl mercury

Carbon monoxide

Lead

Where do you find these?

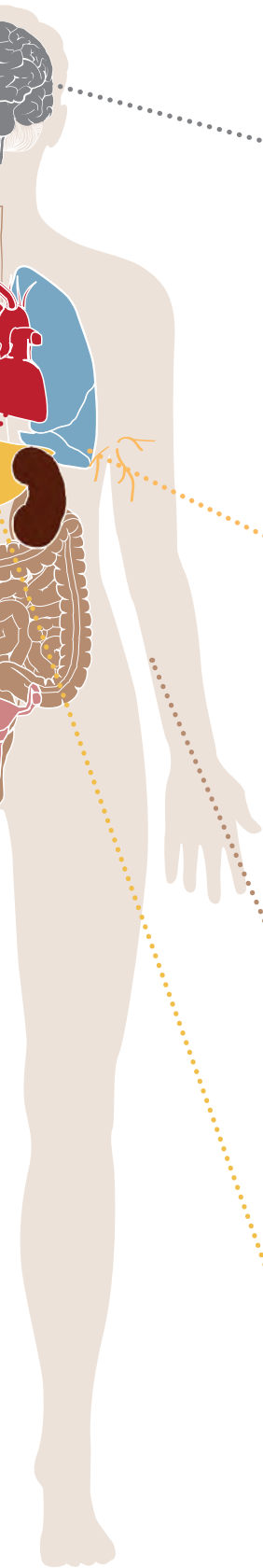
Some fish, coal-burning power

Car exhaust, unvented or faulty furnaces

Old paint, outdated plumbing

Sources: National Institutes of Health Household Products Database, <http://hpd.nlm.nih.gov/index.htm>; Agency for Toxic Substances and Disease Registry (ATSDR)'s ToxFaq, <http://www.atsdr.cdc.gov/toxfaq.html>.

Health Effects of Some Chemicals on Your Body Systems



The NERVOUS SYSTEM's function is to transmit messages from one part of the body to another. It includes the central nervous system (the brain and spinal cord) and the peripheral nervous system. Possible health effects of the nervous system include inability to move, loss of feeling, confusion, and decreased speech, sight, memory, muscle strength, or coordination.

Possible Contaminants

Arsenic
Cadmium
Carbon monoxide
Cyanide

Where do you find these?

Pressure treated wood
Discarded batteries
Car exhaust, unvented or faulty furnaces
Rat poison

The IMMUNE SYSTEM's function is to protect the body from tumor cells, environmental substances, and invading viruses or bacteria. It includes the lymph system, bone marrow, white blood cells, and the spleen. Possible health effects of the immune system include overreaction to environmental substances (allergy), immune system slow down or failure, and autoimmunity (autoimmunity causes the body to attack itself – which makes it more likely to have an over-reaction or infection).

Possible Contaminants

Mercury
Lead
Pesticides
Polychlorinated biphenyls (PCBs)
Polycyclic aromatic hydrocarbons (PAHs)

Where do you find these?

Thermostats, thermometers, some fish
Old paint, outdated plumbing
Unwashed fruits and vegetables
Industrial waste, fish from contaminated water
Cigarette smoke, vehicle exhaust, asphalt roads

The SKIN serves as a barrier to germs and other substances, prevents dehydration, and regulates body temperature. Possible health effects of the skin include irritation, rash, redness or discoloration, dermatitis, and health effect related to other systems and organs due to contamination through the skin.

Possible Contaminants

Nickel
Mercury
Arsenic
Chromium
Polychlorinated biphenyls (PCBs)
VOC (volatile organic compounds)

Where do you find these?

Cement
Thermostats, thermometers, some fish
Pressure treated wood
Paints, industrial production
Industrial waste, fish from contaminated water
Fumes from gasoline, paint, adhesives, building supplies

The HEPATIC SYSTEM's function is to break down food and store nutrients, to make proteins which are essential for blood to clot, and to purify the body of drugs, contaminants, or chemicals. It includes the liver and its veins. Possible health effects of the hepatic system include liver damage, tumors, accumulation of fat (steatosis), and death of liver cells.

Possible Contaminants

Carbon tetrachloride
Methylene chloride
Vinyl chloride

Where do you find these?

Adhesives
Auto part cleaners, paint removers
Pipe sealer

Health Effects of Chemical Exposure



Wash fruits and vegetables

Keep home ventilated



You come into contact with chemicals every day, but that does not necessarily mean that you will get sick. The human body has a good defense system. It usually tries to get rid of harmful substances.

Some diseases get worse when you come into contact with a harmful substance, and some diseases are caused by exposure to chemicals. A few examples of diseases caused by an exposure include smog and asthma caused by exposure to smog, mesothelioma caused by exposure to asbestos, and learning disabilities caused by exposure to lead.

You can reduce your contact with harmful chemicals by

- Being aware of chemicals in everyday products;
- Being aware of any contamination, pollution, or hot spots (areas known to have harmful amounts of contamination) around your home or work;
- Washing your hands;
- Washing fruits and vegetables;
- Reading labels that warn you about chemical exposure;
- Not burning treated wood;
- Keeping your home ventilated;
- Following proper disposal guidelines for electronics, batteries, paint, and other harmful chemical-containing products;
- Limiting intake of fish high in mercury and following local fish advisories (But remember: Consuming low-mercury fish is part of a healthy diet!); and
- Avoiding cigarette smoke.

For more information about the health effects of chemical exposure or other environmental health topics, please call the ATSDR Information Center, toll-free, at 1-800-232-4636; or visit our Web site at <http://www.atsdr.cdc.gov>.

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.