NIEHS
National Institute of
Environmental Health Sciences

NATIONAL INSTITUTES OF HEALTH

The AIR, the WATER, the SUN, the DUST, PLANTS and ANIMALS, and the CHEMICALS and METALS of our WORLD...

They support life.

They make it beautiful and fun.

But, as wonderful as they are...

They can also make some people sick. Here are some diseases that are related to your

ENVIRONMENT... From A to Z...

And some ideas for preventing or caring for them.

Allergies and Asthma (AZ-ma)

Slightly more than half of the 300 million people living in the U.S. are sensitive to one or more allergens.* They sneeze, their noses run and their eyes itch from pollen, dust and other substances. Some suffer sudden attacks that leave them breathless and gasping for air. This is allergic asthma. Asthma attacks often occur after periods of heavy exercise or during sudden changes in the weather. Some can be triggered by pollutants and other chemicals in the air and in the home. Doctors can test to find out which substances are causing reactions. They can also prescribe drugs to relieve the symptoms.

*Prevalences of Positive Skin Test Responses to 10 Common Allergens in the U.S. Population: Results from the Third National Health and Nutrition Examination Survey" *Jour. Allergy Clinical Immunol.* August 2005.

Birth Defects

Sometimes, when pregnant women are exposed to chemicals or drink a lot of alcohol, harmful substances reach the fetus. Some of these babies are born with an organ, tissue or body part that has not developed in a normal way. Aspirin and cigarette smoking can also cause birth problems. Birth defects are the leading cause of death for infants during the first year of life.* Many of these could be prevented.

*National Institute of Child Health and Human Development.

Cancer

Cancer occurs when a cell or group of cells begins to multiply more rapidly than normal. As the cancer cells spread, they affect nearby organs and tissues in the body. Eventually, the organs are not able to perform their normal functions. Cancer is the second leading cause of death in the U.S., causing more than 500,000 deaths each year.* Some cancers are caused by substances in the environment: cigarette smoke, asbestos, radiation, natural and man-made chemicals, alcohol, and sunlight. People can reduce their risk of getting cancer by limiting their exposure to these harmful agents.

*Centers for Disease Control and Prevention Office of Minority Health.

Dermatitis (durmuh TIE-tiss)

Dermatitis is a fancy name for inflamed, irritated skin. Many of us have experienced the oozing bumps and itching caused by poison ivy, oak and sumac. Some chemicals found in paints, dyes, cosmetics and detergents can also cause rashes and blisters. Too much wind and sun make the skin dry and chapped. Fabrics, foods, and certain medications can cause unusual reactions in some individuals. People can protect themselves from poison ivy by following a simple rule: "Leaves of three, leave them be." Smart folks know their poisons.

Emphysema (EM-fuh-ZEE-ma)

Air pollution and cigarette smoke can break down sensitive tissue in the lungs. Once this happens, the lungs cannot expand and contract properly. This condition is emphysema. About 2 million Americans have this disease. For these people, each breath is hard work. Even moderate exercise is difficult. Some emphysema patients must breathe from tanks of oxygen.

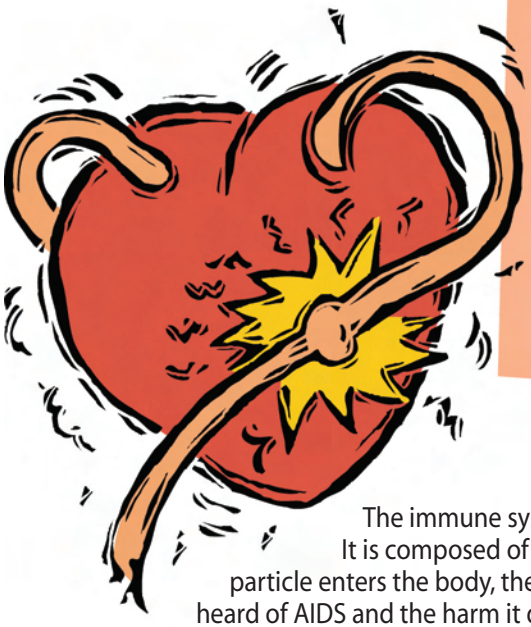
Fertility Problems

Fertility is the ability to produce children. However, one in eight couples has a problem. However, more than 10 percent of couples cannot conceive after one year of trying to become pregnant.* Infertility can be caused by infections that come from sexual diseases or from exposure to chemicals on the job or elsewhere in the environment. Researchers at The National Institute of Environmental Health Sciences (NIEHS) have shown that too much caffeine in the diet can temporarily reduce a woman's fertility. NIEHS scientists have also pinpointed the days when a woman is likely to be fertile.

*National Library of Medicine's *Medline Plus*.

Goiter (GOY-ter)

Sometimes people don't get enough iodine from the foods they eat. This can cause a small gland called the thyroid to grow larger. The thyroid can become so large that it looks like a baseball sticking out of the front of your neck. This is called goiter. Since the thyroid controls basic functions like growth and energy, goiter can produce a wide range of effects. Some goiter patients are unusually restless and nervous. Others tend to be sluggish and lethargic. Goiter became rare after public health officials decided that iodine should be added to salt.



Heart Disease

Heart disease is the leading cause of death in the United States and is a major cause of disability. Almost 700,000 Americans die of heart disease each year.* While these may be due in part to poor eating habits and/or lack of excercise, environmental chemicals also play a role. While most chemicals that enter the body are broken down into harmless substances by the liver, some are converted into particles called free radicals that can react with proteins in the blood to form fatty deposits called plaques, which can clog blood vessels. A blockage can cut off the flow of blood to the heart, causing a heart attack.

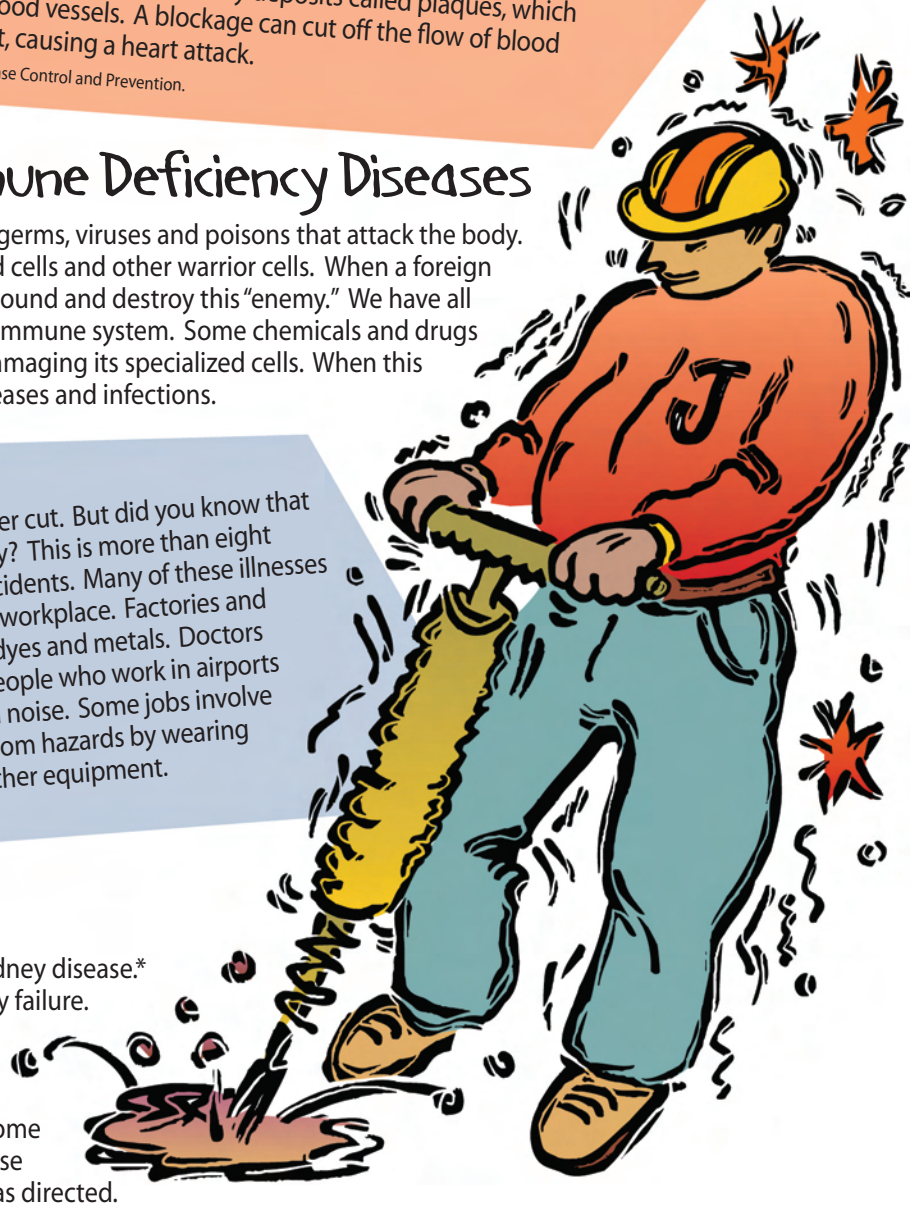
*Centers for Disease Control and Prevention.

Immune Deficiency Diseases

The immune system fights germs, viruses and poisons that attack the body. It is composed of white blood cells and other warrior cells. When a foreign particle enters the body, these cells surround and destroy this "enemy." We have all heard of AIDS and the harm it does to the immune system. Some chemicals and drugs can also weaken the immune system by damaging its specialized cells. When this occurs, the body is more vulnerable to diseases and infections.

Job-Related Illnesses

Every job has certain hazards. Even a writer can get a paper cut. But did you know that about 137 workers die from job-related diseases every day? This is more than eight times the number people of who die from job-related accidents. Many of these illnesses are caused by chemicals and other agents present in the workplace. Factories and scientific laboratories can contain poisonous chemicals, dyes and metals. Doctors and other health workers have to work with radiation. People who work in airports or play in rock concerts can suffer hearing loss from loud noise. Some jobs involve extreme heat or cold. Workers can protect themselves from hazards by wearing special suits and using goggles, gloves, ear plugs, and other equipment.



Kidney Diseases

About 7.5 million adults have some evidence of chronic kidney disease.* These diseases range from simple infections to total kidney failure. People with kidney failure cannot remove wastes and poisons from their blood. They depend on expensive kidney machines in order to stay alive. Some chemicals found in the environment can produce kidney damage. Some nonprescription drugs, when taken too often, can also cause kidney problems. Be sure to read the label and use drugs as directed.

*National Kidney and Urologic Diseases Information Clearinghouse.

Lead Poisoning

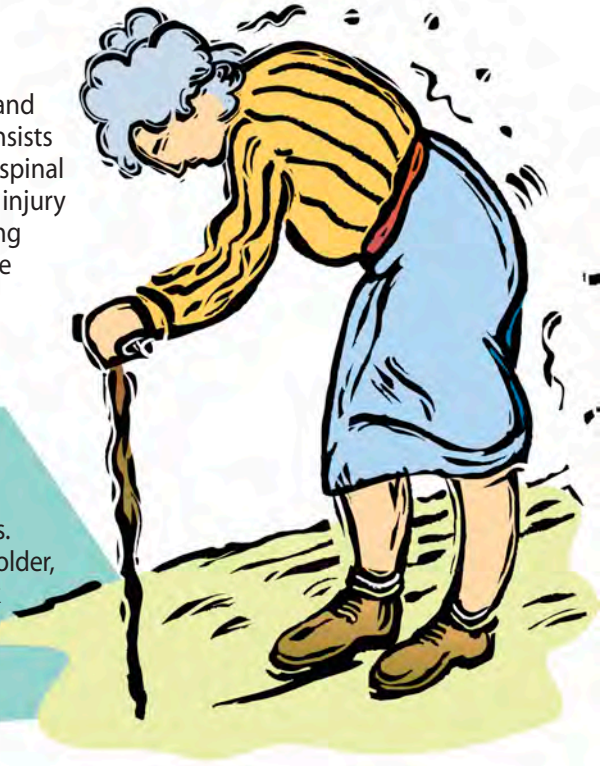
Sometimes, infants and children will pick up and eat paint chips and other objects that contain lead. Lead dust, fumes and lead-contaminated water can also introduce lead into the body. Lead can damage the brain, kidneys, liver, and other organs. Severe lead poisoning can produce headaches, cramps, convulsions, and even death. Even small amounts can cause learning problems and changes in behavior. Doctors can test for lead in the blood and recommend ways to reduce further exposure.

Mercury Poisoning

Mercury is a silvery metal that is extremely poisonous. Very small amounts can damage the kidneys, liver and brain. Years ago, workers in hat factories were poisoned by breathing the fumes from mercury used to shape the hats. Remember the "Mad Hatter" in Alice in Wonderland? Today, mercury exposure usually results from eating contaminated fish and other foods that contain small amounts of mercury compounds. Since the body cannot get rid of mercury, it gradually builds up inside the tissues. If it is not treated, mercury poisoning can eventually cause pain, numbness, weak muscles, loss of vision, paralysis and even death.

Nervous System Disorders

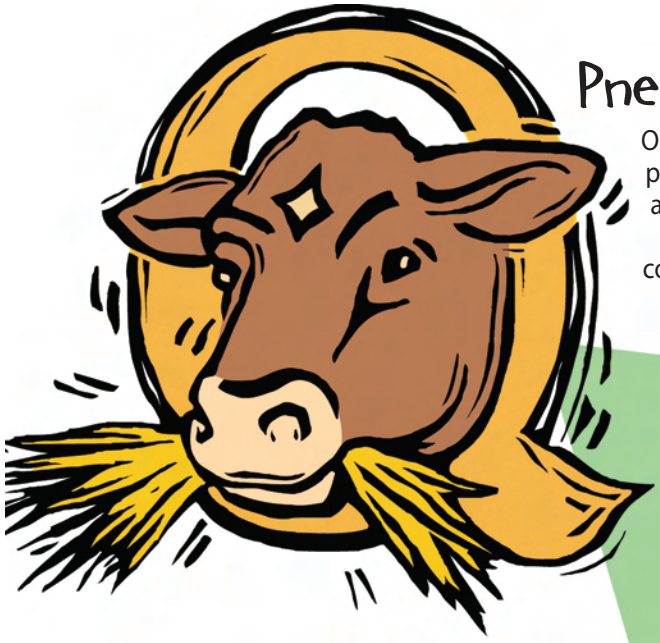
The nervous system, which includes the brain, spinal cord and nerves, commands and controls our thoughts, feelings, movements, and behavior. The nervous system consists of billions of nerve cells. They carry messages and instructions from the brain and spinal cord to other parts of the body. When these cells are damaged by toxic chemicals, injury or disease, this information system breaks down. This can result in disorders ranging from mood changes and memory loss to blindness, paralysis and death. Proper use of safety devices such as seat belts, child restraints and bike helmets can prevent injuries and save lives.



Osteoporosis (OSS-tee-oh-por-OH-sis)

Over 10 million Americans have osteoporosis, while 18 million others have lost bone mass and are likely to develop osteoporosis in the future.* This is called osteoporosis. About 25 million Americans suffer from some kind of bone thinning. As people get older, back problems become more common, and bones in the spine, hip and wrists break more easily. Young people can lower their chances of getting osteoporosis in later years by exercising and eating calcium-rich foods like milk and yogurt.

*Harvard Center for Cancer Prevention.



Pneumoconiosis (NEW-mo-koh-nee-OH-sis)

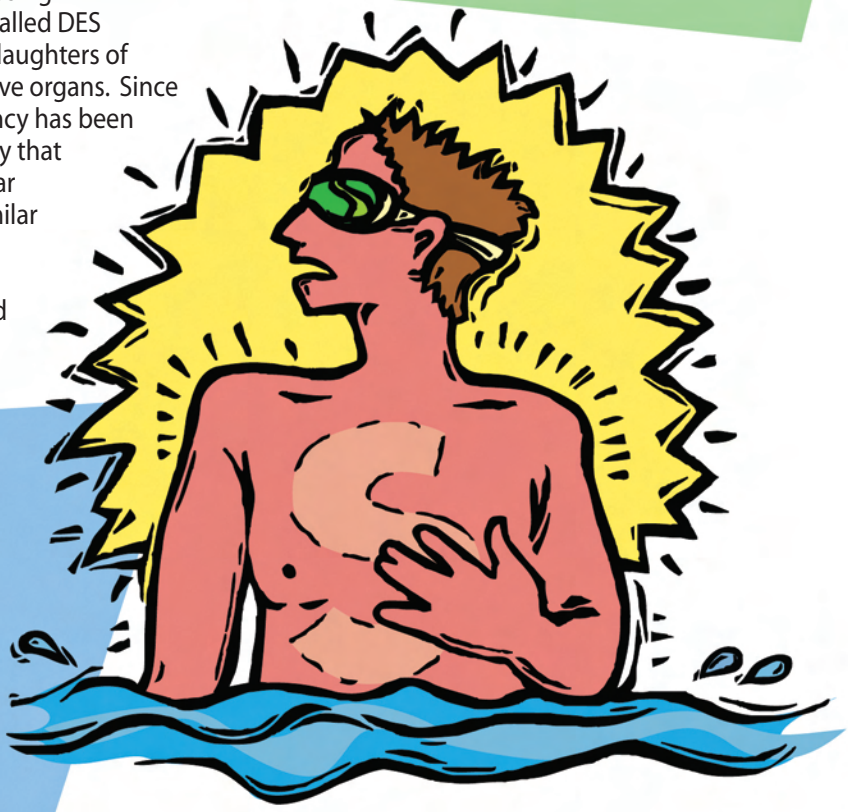
Ordinary house and yard dusts do not pose a serious health hazard. But some airborne particles can be very dangerous. These include fibers from asbestos, cotton and hemp, and dusts from such compounds as silica, graphite, coal, iron, and clay. These particles can damage sensitive areas of the lung, turning healthy tissue into scar tissue. This condition is called pneumoconiosis, or black lung. Chest pains and shortness of breath often progress to bronchitis, emphysema, and/or early death. Proper ventilation and the use of protective masks can greatly reduce the risk of lung disease.

Queensland Fever

People do not usually get diseases from farm animals. However, those who work with hides and animal products can get sick from breathing the infected dust around them. This illness is called Queensland fever because it was first discovered among cattle ranchers and dairy farmers in Queensland, Australia. It is caused by a tiny organism that infects livestock and then spreads to the milk and feces. Symptoms include fever, chills, and muscle aches and pains. Researchers have developed vaccines to protect livestock workers from this illness.

Reproductive Disorders

Beginning in the late 1940's, many women who were in danger of losing their unborn babies were prescribed a synthetic female hormone called DES (diethylstilbestrol). In 1971, scientists discovered that some of the daughters of these women were developing a very rare cancer of the reproductive organs. Since then, the use of DES and other synthetic hormones during pregnancy has been discontinued. NIEHS and other agencies are studying the possibility that some natural chemicals and man-made pesticides may cause similar problems. They are finding that some of these chemicals are so similar to female estrogen that they may actually "mimic" this important hormone. As a result, they may interfere with the development of male and female reproductive organs. This can lead to an increased risk of early puberty, low sperm counts, ovarian cysts, and cancer of the breast or testicles.



Sunburn and Skin Cancer

Almost everyone has stayed in the sun too long and been burned. Too much sunlight can also produce the most common type of cancer—skin cancer. Some skin cancers are easy to treat because they do not spread beyond the surrounding tissue. Others, like melanoma, are much more dangerous because they spread to other parts of the body. Deaths due to melanoma are increasing by 4 percent each year. More than 7,800 people died from melanomas of the skin in 2003.*

*Centers for Disease Control and Prevention.

Tooth Decay

In the 1930's, health experts noticed that people who lived in areas where the water contained natural chemicals called fluorides had fewer cavities. Today, all U.S. residents are exposed to fluoride to some degree, and its use has resulted in a significant decline in tooth decay. National surveys report that the incidence of tooth decay among children 12 to 17 years of age has declined from 90 percent in 1971 to 67 percent in 1988. Dentists can also protect young teeth by applying special coatings called sealants.

Report titled "Recommendations for Using Fluoride to Prevent and Control Dental Caries in the U.S." from Centers for Disease Control and Prevention.

Uranium Poisoning

Uranium is a dangerous element because it is radioactive. This means it gives off high-energy particles that can go through the body and damage living tissue. A single high dose of radiation can kill. Small doses over a long period can also be harmful. For example, miners who are exposed to uranium dust are more likely to get lung cancer. Uranium poisoning can also damage the kidneys and interfere with the body's ability to fight infection. While most people will never come in contact with uranium, those who work with medical x-rays or radioactive compounds are also at risk. They should wear lead shields and follow recommended safety guidelines to protect themselves from unnecessary exposure.

Vision Problems

Our eyes are especially sensitive to the environment. Gases found in polluted air can irritate the eyes and produce a burning sensation. Tiny particles from smoke and soot can also cause redness and itching of the eyes. Airborne organisms like molds and fungus can cause infections of the eyes and eyelids. Too much exposure to the sun's rays can eventually produce a clouding of the lens called a cataract.

Waterborne Diseases

Even our clearest streams, rivers, and lakes can contain chemical pollutants. Heavy metals like lead and mercury can produce severe organ damage. Some chemicals can interfere with the development of organs and tissues, causing birth defects. Others can cause normal cells to become cancerous. Some of our waterways also contain human and animal wastes. The bacteria in the wastes can cause high fever, cramps, vomiting, and diarrhea.

Xeroderma Pigmentosa (zero-DER-muh pig-men-TOSE-uh)

Xeroderma is a rare condition that people inherit from their parents. When these people are exposed to direct sunlight, their skin breaks out into tiny dark spots that look like freckles. If this condition is not treated, the spots can become cancerous. These areas must then be removed by a surgeon.

Yusho Poisoning

In 1968, more than one thousand people in western Japan became seriously ill. They suffered from fatigue, headache, cough, numbness in the arms and legs, and unusual skin sores. Pregnant women later delivered babies with birth defects. These people had eaten food that was cooked in contaminated rice oil. Toxic chemicals called PCB's (polychlorinated biphenyls) had accidentally leaked into the oil during the manufacturing process. Health experts now refer to this illness as "Yusho," which means "oil disease."

For years, PCB's were widely used in the manufacturing of paints, plastics and electrical equipment. When scientists discovered that low levels of PCB's could kill fish and other wildlife, their use was dramatically reduced. By this time, PCB's were already leaking into the environment from waste disposal sites and other sources. Today, small amounts of these compounds can still be found in our air, water, soil, and some of the foods we eat.

Zinc Deficiency/ Poisoning

Zinc is a mineral that the body needs to function properly. In rare cases, people can be poisoned if there is too much zinc in their food or water. However, most people can take in large quantities without any harmful effects. In areas where nutrition is a problem, people may not get enough zinc from their diet. This can lead to retarded growth, hair loss, delayed sexual maturation, eye and skin lesions, and loss of appetite.*

*NIH Office of Dietary Supplements.

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