

Trichloroethylene (TCE)

Answers to Frequently Asked Questions

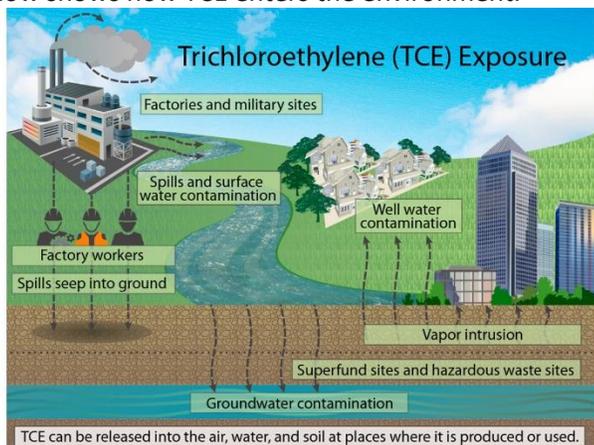
What is TCE?

Trichloroethylene (try-klar'oh-eth'uh-leen), or TCE, is a man-made chemical. TCE is a colorless liquid with a sweet smell. TCE is mainly used by industries to remove grease from metal equipment, but it can also be used in dry cleaning, used to make other chemicals, and found in some household products like paint strippers, glues, and pesticides (bug sprays).

TCE is not naturally found in the environment. However, TCE evaporates (changes from a liquid to a gas) quickly when it meets the air, and it can enter the environment when someone uses it, spills it, or disposes of it in an unsafe way. Factories that produce TCE can also release it into the environment.

What happens to TCE in the environment?

TCE can be released into the air, water, and soil at places where it is made, used, or thrown away. The picture below shows how TCE enters the environment.



- An industry that uses or makes TCE can release it into the environment. It can enter the air through evaporation, or go into the soil or nearby surface water through spills or unsafe disposal.
- Surface water (like lakes, ponds, and streams) can become contaminated with TCE. Slowly, the TCE will evaporate into the air.
- Sometimes, TCE can enter groundwater (drinking water) through polluted surface water or soil. It is hard for TCE to evaporate from groundwater.
- TCE that evaporates from soil or groundwater below a home or building can enter the indoor air. This is called vapor intrusion.

Can TCE make me sick?

Inhaling (breathing) TCE vapors or drinking water contaminated with TCE are the two most common ways that TCE can enter your body. Less common ways include eating food contaminated with TCE and absorbing TCE through your skin. TCE turns into a gas in your bloodstream and you breathe most of it out.

Whether you get sick from TCE depends on:

- How much TCE you were exposed to (dose).
- How long you were exposed to TCE (duration).
- How often you were exposed to TCE (frequency).
- General health, age, and lifestyle.

People who have the greatest chance of getting sick are people in poor health who are often exposed to very high levels of TCE for a very long time.

What health problems can TCE cause?

Immediate, short-term effects of being exposed to high levels of TCE can include skin rash (if you touch TCE), headache, dizziness, and sleepiness. More severe effects of exposure to very high levels of TCE include damage to the nervous system, liver, kidneys, heart and sight. In the worst cases, extreme TCE exposure can cause coma and death.

Women who are in their first 8 weeks of pregnancy are most sensitive to TCE exposures. TCE exposures may increase the risk of health problems in the developing fetus, like problems with the immune system which make the baby prone to infections.

Some men who are often exposed to TCE in their workplace may have lower sex drives and damaged sperm.

Can TCE cause cancer?

The International Agency for Research on Cancer (IARC) has found scientific proof that TCE can cause kidney cancer in people. There has also been some research which shows that TCE may cause liver cancer and Non-Hodgkin lymphoma (a type of blood cancer).

The U.S. EPA lists TCE as a human carcinogen (a chemical which causes cancer in people.)

How does TCE affect children?

Children who are exposed to high levels of TCE through air, water, soil, or food can have the same health problems as adults, which can include dizziness, sleepiness, headache, organ damage, coma, or death. TCE exposure may also put children at risk for cancer.

Some research shows that TCE may cause health problems for unborn babies, such as heart defects, low birth weight, and miscarriage.

Can a medical test show if I was exposed to TCE?

A doctor can measure if there is TCE in your body by testing your blood or urine. However, because TCE usually leaves the body quickly, you will need to be tested within a few hours after you are exposed.

Keep in mind that these tests may show the amount of TCE in your body, but they cannot tell you whether you will have health problems because of it.

How can I protect myself and my family from TCE?

If you know that there is TCE in or around your home, there are steps you can take to protect yourself from:

- **TCE in water:** Do not drink or cook with water that is known to have TCE in it. Use another source of water, like bottled water, until your drinking water is safe again. Take shorter, cooler showers to prevent TCE vapors from contaminated water.
- **TCE in soil:** If you live near a factory or waste area (like a dump or landfill) where TCE may be polluting the environment around your home, limit your exposure to soil and dust. Clean your home often and use air filters to keep soil out. Do not let your children put soil into their mouths, and make sure they wash their hands after playing outside. If your yard has exposed soil, cover it with thick grass or mulch.
- **TCE in household products:** Many items that are meant to be used in the home, like paint stripper, glue, and pesticides, can contain TCE. Check the labels of all chemical products that you buy for your home to know if they contain TCE, and follow all instructions and warnings that are printed on the labels.
- **TCE in workplace air:** If you work in a place where you are exposed to TCE, follow all safety regulations and wear any required safety equipment

How does the federal government protect me from TCE?

The federal government develops regulations and recommendations to protect the public from the harmful effects of TCE. Different agencies set guidelines for:

- **Drinking water.** The U.S. EPA has set a national goal for the level of TCE in drinking water to be 0 to prevent health problems like liver cancer. The U.S. EPA has also set a maximum allowed limit of 0.005 parts TCE for every million parts drinking water (0.005 mg/L).
- **Workplace air.** The Occupational Safety and Health Administration (OSHA) limits the amount of TCE in workplace air during an 8-hour work day to 100 parts TCE for every million parts air (100 ppm). The National Institute for Occupational Safety and Health (NIOSH) considers TCE to be an occupational carcinogen (a cancer-causing substance found in the workplace).



If your usual source of drinking water for your home contains TCE, do not drink it or cook with it. Use a different source, like bottled water, until your usual water supply is safe again. (Image source: 123RF)

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2014. Draft toxicological profile for trichloroethylene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

National Institute of Environmental Health Sciences (NIEHS). 2016. Trichloroethylene. U.S. Department of Health and Human Services, National Institutes of Health.

Where Can I Get More Information?

Ohio Department of Health
Bureau of Environmental Health and Radiation Protection
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 728-9452