



**Bureau of
Environmental Health
Health Assessment Section**

"To protect and improve the health of all Ohioans"

Trichloroethylene (TCE)

(try- klor'oh eth'uh- leen)

Answers to Frequently Asked Health Questions

What is TCE?

TCE is man-made chemical that is not found naturally in the environment. TCE is a non-flammable (does not burn), colorless liquid with a somewhat sweet odor and has a sweet, "burning" taste. It is mainly used as a cleaner to remove grease from metal parts. TCE can also be found in glues, paint removers, typewriter correction fluids and spot removers.

The biggest source of TCE in the environment comes from evaporation (changing from a liquid into a vapor/gas) when industries use TCE to remove grease from metals. But TCE also enters the air when we use common household products that contain TCE. It can also enter the soil and water as the result of spills or improper disposal.

What happens to TCE in the environment?

- TCE will quickly evaporate from the surface waters of rivers, lakes, streams, creeks and puddles.
- If TCE is spilled on the ground, some of it will evaporate and some of it may leak down into the ground. When it rains, TCE can sink through the soils and into the ground (underground drinking) water.
- When TCE is in an oxygen-poor environment and with time, it will break down into different chemicals such as 1,2 Dichloroethene and Vinyl Chloride.
- TCE does not build up in plants and animals.
- The TCE found in foods is believed to come from TCE contaminated water used in food processing or from food processing equipment cleaned with TCE.

How does TCE get into your body?

- TCE can get into your body by breathing (inhalation) air that is polluted with TCE vapors. The vapors can be produced from the manufacturing of TCE, from TCE polluted water evaporating in the shower or by using household products such as spot removers and typewriter correction fluid.
- TCE can get into your body by drinking (ingestion) TCE polluted water.
- Small amounts of TCE can get into your body through skin (dermal) contact. This can take place when using TCE as a cleaner to remove grease from metal parts or by contact with TCE polluted soils.

Can TCE make you sick?

Yes, you can get sick from TCE. But getting sick will depend on the following:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How does TCE affect your health?

Breathing (Inhalation):

- Breathing high levels of TCE may cause headaches, lung irritation, dizziness, poor coordination (clumsy) and difficulty concentrating.
- Breathing very high levels of TCE for long periods may cause nerve, kidney and liver damage.

Drinking (Ingestion):

- Drinking high concentrations of TCE in the water for long periods may cause liver and kidney damage, harm immune system functions and damage fetal development in pregnant women (although the extent of some of these effects is not yet clear).
- It is uncertain whether drinking low levels of TCE will lead to adverse health effects.

Skin (Dermal) Contact:

- Short periods of skin contact with high levels of TCE may cause skin rashes.



Does TCE cause cancer?

The National Toxicology Program's 11th Report on Carcinogens places chemicals into one of two cancer-causing categories: *Known to be Human Carcinogens* and *Reasonably Anticipated to be Human Carcinogens*.

The 11th Report on Carcinogens states TCE is "*Reasonably Anticipated to be Human Carcinogen*."

The category "*Reasonably Anticipated to be Human Carcinogen*" gathers evidence mainly from animal studies. There may be limited human studies or there may be no human or animal study evidence to support carcinogenicity; but the agent, substance or mixture belongs to a well-defined class of substances that are known to be carcinogenic.

There are human studies of communities that were exposed to high levels of TCE in drinking water and they have found evidence of increased leukemia's. But the residents of these communities were also exposed to other solvents and may have had other risk factors associated with this type of cancer.

Animal lab studies in mice and rats have suggested that high levels of TCE may cause liver, lung, kidney and blood (lymphoma) cancers.

As part of the National Exposure Subregistry, the Agency for Toxic Substances and Disease Registry (ATSDR) compiled data on 4,280 residents of three states (Michigan, Illinois, and Indiana) who had environmental exposure to TCE. ATSDR found no definitive evidence for an excess of cancers from these TCE exposures.

The U.S. EPA is currently reviewing the carcinogenicity of TCE.

Is there a medical test to show whether you have been exposed to TCE?

If you have recently been exposed to TCE, it can be detected in your breath, blood, or urine. The breath test, if done soon after exposure, can tell if you have been exposed to even a small amount of TCE.

Exposure to larger amounts is measured in blood and urine tests. These tests detect TCE and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products in the blood and urine so the detection of the breakdown products is not absolute proof of exposure to TCE.

These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. **Note:** Tests can determine if you have been exposed to TCE but cannot predict if you will experience adverse health effects from the exposure.

Has the federal government made recommendations to protect human health?

The federal government develops regulations and recommendations to protect public health and these regulations can be enforced by law.

Recommendations and regulations are periodically updated as more information becomes available. Some regulations and recommendations for TCE follow:

- The Environmental Protection Agency (EPA) has set a maximum contaminant level for TCE in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water (5 ppb).
- The Occupational Safety and Health Administration (OSHA) have set an exposure limit of 100 ppm (or 100 parts of TCE per million parts of air) for an 8-hour workday, 40-hour workweek.
- The EPA has developed regulations for the handling and disposal of TCE.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for TCE (electronic at <http://www.atsdr.cdc.gov/tfacts19.html>)

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2005 (2005 electronic at <http://ntp.niehs.nih.gov/ntp/roc/toc11.html>)

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

This pamphlet was created by the Ohio Department of Health, Bureau of Environmental Health, Health Assessment Section and supported in whole by funds from the Cooperative Agreement Program grant from the ATSDR.

