

Fact Sheet on Ethylene Oxide August 2018



Introduction:

The information provided in this fact sheet is intended to provide the public with basic information regarding the potential health impacts from exposure to ethylene oxide vapors. Physicians who specialize in the assessment of this type of exposure are available for consultation with residents and healthcare providers who are concerned about exposure to ethylene oxide from the Sterigenics International, Inc. facility in Willowbrook, Illinois.

What is ethylene oxide and how can I be exposed?

Ethylene oxide is a chemical used to sterilize medical equipment in hospitals and industrial settings. Ethylene oxide is also used to fumigate items that cannot be sterilized by steam such as spices, cosmetics, and plastic devices. Workers in facilities using ethylene oxide may be exposed to it during the sterilization process. The general public can be exposed to ethylene oxide in some consumer products such as tobacco, food, and spices that are often fumigated with ethylene oxide for sterilization. Ethylene oxide is also used in the production of synthetic fibers (e.g., upholstery, carpet), plastics, PVC pipe and cosmetics and therefore can be found in indoor air. It is also present in car exhaust. When ethylene oxide vapors are released into the air from an industrial source such as the Sterigenics facility in Willowbrook, people can be exposed by breathing contaminated air. Compared to adults, children receive larger doses because they have greater lung surface area and increased lung volume per body weight.

How long does ethylene oxide stay in the body?

After inhaling ethylene oxide it takes about 45 to 60 minutes for half of it to break down and be exhaled back out of the body (the "half-life"). That means that ethylene oxide will be completely eliminated from the body within 1-2 days to a week after being exposed. When the contaminant is present in the air continuously, levels will also be present in the body continuously.

How can ethylene oxide affect my health?

Much of what we know about the health effects of ethylene oxide exposure are based on studies of workers in sterilization facilities. The exposures to workers occur at much higher levels than what has been detected in the air of the Willowbrook community near the Sterigenics facility. An evaluation of 18,000 sterilizer facility workers by the National Institute of Occupational Safety and Health determined that workers have experienced nausea, vomiting, bronchitis, pulmonary edema, emphysema and miscarriages. Long-term exposures at lower levels for several months to years may cause irritation of the eyes, skin, and respiratory passages and nervous system effects, such as headache, nausea, memory loss, and numbness.

The National Toxicology Program at the US Department of Health and Human Services (DHHS) has determined that ethylene oxide “may reasonably be anticipated to be a human carcinogen.” Long-term exposures may increase the risk of leukemia, lymphoma, and breast cancer compared to people who have not been exposed. It is not known how long a person needs to be exposed to ethylene oxide to have a higher risk for these cancers, but it is believed that the longer the exposure, the higher the risk of cancer. The exact level of risk, or “chances”, of cancer to residents of the contaminated area of Willowbrook is not known exactly, since it depends on many factors such as weather patterns that disperse contaminants, how much time is spent indoors compared to outdoors, individual health factors such as smoking, and hereditary factors.

Can I get tested for Ethylene Oxide?

The ability to detect ethylene oxide in the body is dependent on the level of exposure and how much time has passed since the exposure has ended. There are two basic tests – blood test and exhaled air test – that can verify that exposure has occurred in the last few days to a week. The problems with testing are: 1) these tests cannot determine where the exposure is from. There may be some exposure from products you use every day. 2) It is not known what levels cause which health effects. 3) There is no way to predict if someone is going to get cancer. The statistics used by EPA and ATSDR show only the level of risk, or “chances” of getting cancer in people exposed to the highest levels taken in May 2018 prior to the emission controls installed at the Sterigenics facility.

No special medical screening is recommended for this community- level exposure to ethylene oxide. But it is important for all of us to continue to reduce our exposures to cancer-causing chemicals and follow medical advice to get regular screening mammograms for breast cancer and routine blood testing for cancer and other health problems. Healthcare providers needing more information may contact us at the number below.

Contact information for the Great Lakes Center for Children’s Environmental Health at the University of Illinois at Chicago*

Website: <http://publichealth.uic.edu/great-lakes/childrens-health>

Phone: 866-967-7337

Email: ChildrensEnviro@uic.edu

Additional resources about ethylene oxide:

EPA:

<https://www.epa.gov/sites/production/files/2016-09/documents/ethylene-oxide.pdf>

<https://www.epa.gov/hazardous-air-pollutants-ethylene-oxide/frequent-questions-ethylene-oxide>

National Institutes of Health/National Cancer Institute:

<https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/ethylene-oxide>

This material was supported by the American Academy of Pediatrics (AAP) and funded (in part) by the cooperative agreement FAIN: 1U61TS000237-02 from the Agency for Toxic Substances and Disease Registry (ATSDR). Acknowledgement: The U.S. Environmental Protection Agency (EPA) supports the PEHSU by providing partial funding to ATSDR under Inter-Agency Agreement number DW-5-95877701. Neither EPA nor ATSDR endorse the purchase of any commercial products or services mentioned in PEHSU publications.