



Fact Sheet on Ethylene Oxide in Lake County August 2019



What is ethylene oxide and how can I be exposed?

Ethylene oxide is a chemical commonly used to make other chemicals and is used to sterilize medical equipment. Ethylene oxide is also used to fumigate items that cannot be sterilized by steam such as spices, cosmetics, and plastic devices. The general public can be exposed to ethylene oxide in some consumer products such as tobacco, food, and spices, some synthetic fibers such as upholstery and 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 a sterilization facility, people nearby can be exposed by breathing contaminated air. Compared to adults, children receive larger doses because they have a higher breathing rate and larger lung volume per pound of 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 from a one-time exposure 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. Ethylene oxide can cause changes to the blood cells called hemoglobin adducts. These changes can be seen for up to 4 months. Hemoglobin adducts are measured in the blood to evaluate exposure to ethylene oxide over the past 4 months.

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 or Lake County communities near the ethylene oxide emitting facilities. 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, as well as nervous system effects such as headache, nausea, memory loss, and numbness. The levels at which symptoms occur are more than ten times higher than levels found in Lake County.

The National Toxicology Program at the US Department of Health and Human Services 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 area near ethylene oxide-emitting facilities is not known exactly, since it depends on many factors such as weather patterns that spread contaminants, how much time is spent indoors compared to outdoors, individual health factors such as smoking, and hereditary factors.

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*This material was supported by the American Academy of Pediatrics (AAP) and funded (in part) by the cooperative agreement FAIR: **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.*