

This fact sheet answers the most frequently asked health questions (FAQs) about 2,4,6-trinitrotoluene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**SUMMARY:** Exposure to 2,4,6-trinitrotoluene occurs through eating, drinking, touching, or inhaling contaminated soil, water, food, or air. Health effects reported in people exposed to 2,4,6-trinitrotoluene include anemia, abnormal liver function, skin irritation, and cataracts. This substance has been found in at least 20 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency.

### What is 2,4,6-trinitrotoluene?

(Pronounced 2,4,6-trī/ nī'trō-tōl/ yōō ēn)

2,4,6-Trinitrotoluene is a yellow, odorless solid that does not occur naturally in the environment. It is commonly known as TNT and is an explosive used in military shells, bombs, and grenades, in industrial uses, and in underwater blasting.

2,4,6-Trinitrotoluene production in the United States occurs solely at military arsenals.

### What happens to 2,4,6-trinitrotoluene when it enters the environment?

- 2,4,6-Trinitrotoluene enters the environment in waste waters and solid wastes resulting from the manufacture of the compound, the processing and destruction of bombs and grenades, and the recycling of explosives.
- It moves in surface water and through soils to groundwater.
- In surface water, it is rapidly broken down into other chemical compounds by sunlight.
- It is broken down more slowly by microorganisms in water and sediment.
- Small amounts of it can accumulate in fish and plants.

### How might I be exposed to 2,4,6-trinitrotoluene?

- Drinking contaminated water that has migrated from chemical waste disposal sites.
- Breathing contaminated air.
- Eating contaminated foods such as fruits and vegetables.
- Eating contaminated soil.

### How can 2,4,6-trinitrotoluene affect my health?

Workers involved in the production of explosives who were exposed to high concentrations of 2,4,6-trinitrotoluene in workplace air experienced several harmful health effects, including anemia and abnormal liver function.

Similar blood and liver effects, as well as spleen enlargement and other harmful effects on the immune system, have been observed in animals that ate or breathed 2,4,6-trinitrotoluene.

Other effects in humans include skin irritation after prolonged skin contact, and cataract development after long-term (365 days or longer) exposure.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

It is not known whether 2,4,6-trinitrotoluene can cause birth defects in humans. However, male animals treated with high doses of 2,4,6-trinitrotoluene have developed serious reproductive system effects.

### **How likely is 2,4,6-trinitrotoluene to cause cancer?**

The EPA has determined that 2,4,6-trinitrotoluene is a possible human carcinogen. This assessment was based on a study in which rats that ate 2,4,6-trinitrotoluene for long periods developed tumors of the urinary bladder.

### **Is there a medical test to show whether I've been exposed to 2,4,6-trinitrotoluene?**

Laboratory tests can detect 2,4,6-trinitrotoluene or its breakdown products in blood or urine. Detection of its breakdown products in urine is a clear indication of exposure. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

A simpler, but less specific test of 2,4,6-trinitrotoluene exposure is a change in the color of urine to amber or deep red due to the presence of its breakdown products. However, none of these tests can predict whether a person will experience any health effects.

### **Has the federal government made recommendations to protect human health?**

Since 2,4,6-trinitrotoluene is explosive, flammable, and toxic, EPA has designated it as a hazardous waste.

The Department of Transportation (DOT) specifies that when 2,4,6-trinitrotoluene is shipped, it must be wet with at least 10% water (by weight) and it must be clearly labeled as a flammable solid.

The Occupational Safety and Health Administration (OSHA) set a maximum level of 1.5 milligrams of 2,4,6-trinitrotoluene per cubic meter of workplace air (1.5 mg/m<sup>3</sup>) for an 8-hour workday for a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) recommend an exposure limit of 0.5 mg/m<sup>3</sup> in workplace air for a 40-hour workweek.

### **Glossary**

- Anemia: A decreased ability of the blood to transport oxygen.
- Breakdown product: A substance that is formed when a chemical breaks down in the body.
- Carcinogen: A substance that can cause cancer.
- CAS: Chemical Abstracts Service.
- Cataract: Clouding of the lens or capsule of the eye, causing partial or total blindness.
- Milligram (mg): One thousandth of a gram.

### **References**

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for 2,4,6-trinitrotoluene (update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html> ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

