

Chlorine Gas Exposure

For Service members

Important Facts

- Chlorine gas has been used by insurgents in Iraq in combination with Improvised Explosive Devices (IEDs).
- Most people exposed to chlorine gas make a complete recovery; however, severe exposures can result in death or permanent damage to the lungs and difficulty breathing.

What is chlorine and how is it used?

Chlorine is a yellow-green gas at room temperature. It changes to liquid when under pressure - for example in compressed gas cylinders. Chlorine gas is heavier than air and has a strong irritating odor like bleach. We are able to smell chlorine at levels much lower than those levels considered harmful.

Chlorine is widely used in industry (notably in paper mills and chemical manufacturing plants), for disinfecting drinking water and swimming pools, and in household bleach. When used properly and at appropriate levels, chlorine is a safe and effective disinfectant.

How can chlorine gas exposure occur?

Most major occurrences of chlorine gas exposure have occurred as a result of the release of "bulk" chlorine, for example in road or rail accidents involving chlorine gas tanks, or following damage to industrial facilities. Chlorine is an important toxic industrial chemical (TIC) because it has been intentionally used as a weapon during World War I and in IED detonations in Iraq. Chlorine gas or other caustic chlorine compounds may also be released at dangerous levels in the household following the mixing of bleach with ammonia or acids.

What are possible immediate effects of exposure to chlorine gas?

Chlorine gas is irritating and corrosive to the airways, eyes, and skin. The effects of chlorine gas exposure to your health depends on how long you were exposed, the amount you were exposed, how it enters or impacts your body, and your body's response to the chlorine. Relatively low levels of chlorine gas can cause sore throat, coughing, and eye and skin irritation, while higher levels can cause burning of the eyes and skin, nausea, temporary blindiness, difficulty breathing, and chest

pain. At high enough levels, chlorine gas can cause immediate collapse and death.

What can I do to limit or reduce exposure to chlorine gas?

Emergency measures to limit exposure include rapidly moving as far away from the gas as possible. (Usually upwind and uphill, or upstairs, is best.) Military protective masks (M40/MCU-2A/P protective masks) can be used as an escape device to minimize brief exposures: masks do not make exposure to chlorine totally safe, but may offer enough protection to permit escape from a contaminated area. Covering your mouth and nose with a wet cloth can also offer some protection. In occupational settings, where the possibility of chlorine gas exposure may be anticipated, protective equipment specifically approved for chlorine gas exposures should be available.

What is the treatment for chlorine gas exposure?

Treatment will depend on the severity of the exposure. Initial treatment consists of removing the chlorine from the outside of your body and receiving supportive medical care. If you are exposed to chlorine gas, alone it does not create a contamination hazard for other people you may be around. But make sure to thoroughly wash off your body with plenty of water to clean off any liquid contamination. In the case of chlorine exposure from an IED explosion, Service members should be alert to the potential risk of other chemicals also being released by the explosion. No specific antidote exists for chlorine exposure.

If you believe you may have been exposed to chlorine gas, or any other poisonous substance, seek medical treatment as soon as possible, especially if you have any difficulty breathing or seeing. Symptoms can worsen over the first few hours so medical care should not be delayed. For minor exposures, medical personnel may recommend rest with observation for several hours. Treatment in an Intensive Care Unit may be required to manage severe injury to the lungs. The immediate symptoms usually improve within hours after mild exposures; with moderate exposures, the effects generally resolve over 2 to 6 weeks. Strenuous activity following a recent exposure may aggravate symptoms.

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What are the potential long-term health concerns of chlorine gas exposure?

Most personnel recover completely from chlorine gas exposures, but a few do experience more noticeable long-term effects. There is evidence that very high-level exposures or repeated, milder exposures can cause permanent health problems. But there is no clear evidence a single mild or unapparent exposure to chlorine can cause long-term problems.

The most common long-term symptoms associated with chlorine gas exposure are fatigue, shortness of breath with exercise, and a persistent cough. Others may experience a worsening of pre-existing asthma or develop an asthma-like

illness called Reactive Airways Dysfunction Syndrome (RADS). In some cases, there is evidence of lung damage on testing, but without apparent difficulty with regular breathing. For most people, these long-term symptoms resolve after months or a few years, but occasionally they have persisted indefinitely.

Can the long-term consequences of chlorine exposure be treated?

Yes. Asthma-like symptoms related to chlorine gas exposure usually respond to the same treatment used for asthma. Other lung problems may be treatable by medical specialists, although a small number of people may experience symptoms that cannot be totally controlled, especially when you exercise.

Where Do I Get More Information?

DoD Deployment Health Clinical Center (DHCC)

Phone: (866) 559-1627 http://www.pdhealth.mil/

U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM)

Phone: (800) 222-9698

http://chppm-www.apgea.army.mil

DoD Force Health Protection and Readiness (FHP & R)

Phone: (800) 497-6261 http://fhp.osd.mil

Navy Environmental Health Center (NEHC)

Phone: (757) 953-0700 http://www-nehc.med.navy.mil

CDC | Facts About Chlorine

http://www.bt.cdc.gov/agent/chlorine/basics/facts.asp

Air Force Institute for Operational Health (AFIOH)

Phone: (888) 232-3764

http://www.brooks.af.mil/units/airforceinstituteforoperationalhealth/index.asp

Armed Forces Medical Intelligence Center (AFMIC)

Phone: (301) 619-7574

http://www.afmic.detrick.army.mil



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