



## Just the Facts...

## Tent Heaters - Medical

Tent Heaters are used to maintain warmth in cold environments. They generally fall into one of two categories, vented and unvented.

<b>GENERAL INFORMATION</b>	Tent heaters, as the name implies, are used to heat tents and other semi-enclosed environments. All tent heaters, both those directly vented to the outside, and unvented heaters (usually propane or kerosene fuelled) produce potentially dangerous chemicals as a result of combustion. The most acutely hazardous of these compounds is carbon monoxide. The other major combustion products are sulfur dioxide, carbon dioxide, and nitrogen dioxide.
<b>ROUTINE USES IN THE DEPLOYED SETTING</b>	Tent heaters are used to heat tents and other semi-enclosed environments. They must be used with adequate ventilation.
<b>PERSONAL PROTECTIVE EQUIPMENT (PPE) and COUNTERMEASURES AVAILABLE FOR DEPLOYED PERSONNEL</b>	<p>Eye contact from splashed fuels can be prevented by the use of safety glasses, goggles, or a face-shield. Repeated skin contact with fuels should be avoided. Skin areas that have been contacted with fuels should be washed with water and a mild soap, and then well dried. A hand cream can be used for symptomatic relief.</p> <p>Tent heaters must be used with adequate ventilation. The use of a vented heater provides exhaust ventilation, which significantly increases safety. When vented space heaters are not available, unvented heaters may have been used with command approval. Generally, these should never be used unless someone in the tent remains awake, due to the potential build-up of carbon monoxide. Care must be taken to assure adequate ventilation to avoid a potential build-up of carbon monoxide.</p>
<b>EXPOSURE LEVELS HISTORICALLY ENCOUNTERED</b>	<p><b>DATA IF AVAILABLE</b></p> <p>There are several tent heaters used by the military. When used with adequate ventilation with fresh air (not re-circulated air), these heaters are very safe and levels should remain well within safe ranges. If ventilation is not adequate, the level of carbon monoxide in the air may result in injury or death. Elevated levels of carbon monoxide are more common with unvented heaters, especially propane heaters.</p>
<b>AVAILABLE EXPOSURE DATA</b>	<p><b>DATA IF AVAILABLE</b></p> <p>Preventive Medicine personnel may have evaluated the work or sleeping areas. Carbon monoxide poisoning is more common with unvented heaters; so if this is an area of concern, ask the type of heaters used. Also a common symptom is headache, so an increased suspension is appropriate if personnel in the same tent complain of headaches in the morning that get better during the day.</p>

<p><b>SIGNS &amp; SYMPTOMS OF ACUTE AND CHRONIC EXPOSURE</b></p>	<p>Fuels; Eye exposure to kerosene and diesel fuels can result in irritation and blurred vision. Repeated skin exposure to these fuels can result in de-fatting of the skin with redness and cracking.</p> <p>Combustion products:</p> <p>Carbon Monoxide; symptoms include headache, dizziness, weakness, nausea, vomiting, sleepiness, and confusion. High levels can result in loss of consciousness and death.</p> <p>Nitrogen dioxide; High levels of nitrogen dioxide have been associated with an increased risk of colds in children and possible flair-ups in asthmatics.</p> <p>Sulfur dioxide; In high concentrations has been associated with bronchoconstriction.</p> <p>Carbon dioxide; No acute or chronic effects are expected at concentrations of exposures.</p>
<p><b>REVERSIBILITY OF HEALTH EFFECTS</b></p>	<p>Fuels: After stopping skin contact, the effects of the fuel exposure generally disappear. Skin rashes from direct contact may take a week or so to clear up.</p> <p>Combustion products:</p> <p>Carbon Monoxide: most symptoms will resolve after removal to fresh air. If levels were high enough to cause brain damage, long-term residual effects may occur.</p> <p>Nitrogen dioxide and sulfur dioxide: effects will resolve after removed from exposure.</p>
<p><b>TREATMENT REQUIRED/AVAILABLE FOR EXPOSURE</b></p>	<p>Fuels: The immediate treatment for fuels exposure is to wash with soap and water to remove the fuel. Prevention of the exposure is even more desirable!</p> <p>Eye contact: immediately rinse the affected eye(s) with water for 15 minutes. If symptoms persist, an ophthalmologic evaluation is recommended.</p> <p>Skin contact: rashes can be treated by simply stopping or avoiding skin contact. Hydrocortisone cream may be applied to the skin, orally, or injected steroids should not be required as a result of occasional fuel exposures. If topical treatment is not adequate, consider another cause for the rash.</p> <p>Combustion products:</p> <p>Immediate treatment is to stop continued exposure. Simply moving to fresh air accomplishes this. Oxygen may be needed in more severe carbon monoxide exposures, such as exposures resulting in breathing difficulties or loss of consciousness. Symptoms would be expected from the carbon monoxide before the levels of other combustion products reached ranges expected to cause acute or chronic injury.</p> <p>Generally, there is no medical treatment required for past exposure. In rare instances where the carbon monoxide exposure was high enough to cause brain injury, the damage may be permanent and require rehabilitation with physical and occupational therapy.</p>
<p><b>LONG TERM MEDICAL SURVEILLANCE REQUIREMENTS OF HEALTH EFFECTS MONITORING</b></p>	<p>Fuel and combustion product levels can be measured in the body during and shortly (within a few days) after exposure. There is no long-term medical monitoring required.</p>
<p><b>SPECIAL RISK COMMUNICATION INFORMATION</b></p>	<p>When the patient is no longer exposed, the chemicals are rapidly eliminated from the body. In some cases, a persistent rash may occur at the site of recurrent fuel exposure. These rashes can be treated as any other contact dermatitis. Defatting of the skin should not occur from infrequent exposure to small quantities of fuel. If defatting is evident, try to determine other exposures that may be the cause (hobbies, work with solvents). Treatment will require stopping that exposure (may require change in work habits, not a change of job).</p> <p>In rare cases, where acute carbon monoxide exposure resulted in significant respiratory problems or a loss of consciousness, there may be lasting effects associated with mental tasks. A neurology consult for additional testing would be appropriate for this rare event.</p>