



Bulletin No. 14

July 26, 1985

Carbon Monoxide Fatalities Related to Space Heaters

Between 1981 and 1984, five Alaskans died of carbon monoxide poisoning related to space heaters exhausting into poorly ventilated spaces. These fatalities were ascertained as part of a comprehensive review of carbon monoxide-related deaths in Alaska; three of the deaths related to space heaters occurred during 1984.

The five fatalities between 1981 and 1984 involved male victims whose ages ranged from 32-63. In three cases the implicated space heater burned propane, and in one case, oil. The fuel source of the fifth space heater has not been determined. In one case, the enclosed space being warmed by the space heater was a garage; others were a boat cabin, a van, a bush cabin, and a basement under construction and enclosed by visqueen. There was evidence that the space heater was burning inefficiently (excessive soot and/or foul exhaust) in two cases. All five structures were small and relatively airtight. The five deaths occurred between November and April, with two deaths in December.

Toxicity due to carbon monoxide released into an enclosed space is not a new phenomenon; in ancient Rome the use of wood fires for execution, suicide, and even mass execution was not uncommon.¹ In a review of 567 cases of death related to carbon monoxide in the files of the Armed Forces Institute of Pathology, 297 occurred within buildings such as tourist cabins, apartments, hotels, garages, or barracks.² Any appliance which produces heat through the combustion of carbon-containing material can be a source of carbon monoxide. Fatalities have been associated with charcoal heaters, coal gas, kerosene, diesel, propane, and gasoline heaters.

Analysis of the five space heater-related deaths found during a broader review of carbon monoxide-associated mortality in Alaska indicated factors of especially high risk. These include: 1) heaters burning inefficiently, 2) lack of exhaust to the outdoors, 3) small, poorly ventilated enclosures, 4) winter, 5) men. Public health measures including targeted public education, building design and inspection, construction practices, heater design, inspection and maintenance, would be expected to reduce or eliminate deaths caused by space heaters.

References:

1. Morandi M, Eisenbud M. Carbon monoxide exposure in New York City: a historical overview. *Bull NY Acad Med* 56:817-828, 1980.
2. Finck PA. Exposure and Carbon monoxide: review of the literature and 567 autopsies. *Military Med.* 131:1513-1539, 1966.

(Acknowledgements: Donald Rogers, M.D.; Michael Propst, M.D., Anchorage; J.N. Joy, M.D., Fairbanks; Joan Brooks, Registrar of Vital Statistics, Juneau; coroners, magistrates, and police departments throughout Alaska; Article submitted by Tom Kosatsky, M.D., Center for Environmental Health, Centers For Disease Control, Atlanta, Georgia.)