

FCAA – SFTY 102

Carbon Monoxide

Carbon monoxide is a colorless, tasteless, and nearly odor free gas. It, like a few other gases, is more readily absorbed by the red blood cells (hemoglobin) than is oxygen. In fact CO binds irreversibly to hemoglobin. As a result oxygen is displaced by carbon monoxide; this can lead to tissue damage and likely suffocation and death. Therefore CO is extremely hazardous and poisonous to humans and animals.

Everyday appliances, vehicles, equipment, etc. that are fueled by natural gas, liquefied petroleum gas (LPG), oil, kerosene, coal, wood, charcoal, etc. produce CO as a result of incomplete combustion. Examples:

- Fuel-burning space heaters
- Furnaces
- Charcoal grills
- Cooking ranges
- Water heaters
- Fireplaces
- Generators
- Wood-burning stoves
- Car and truck engines

Confined spaces that are poorly ventilated where an accumulation of CO can occur is where the danger occurs. The sad truth is while there are many deaths annually due to CO poisoning, it is easily preventable.

The symptoms of CO poisoning can be subtle and different depending on the concentration levels, length of exposure, and a person's health conditions. In all cases, **CO poisoning is a life-threatening medical emergency** and immediate medical care must be given to someone with CO poisoning.

Symptoms

Initial symptoms are similar to the flu, without the fever. They include:

- Dull headache. (May be severe)
- Weakness
- Dizziness
- Nausea
- Vomiting
- Shortness of breath
- Confusion
- Blurred vision
- Loss of consciousness

CO causes people to be sleepy and if they are asleep, it prevents them from waking up. The exposure to CO can become fatal before anyone is even aware there is a problem.

FCAA – SFTY 102

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Risk factors

Carbon monoxide exposure may be more dangerous for:

- Unborn babies. The fetal hemoglobin absorbs CO more readily than adult.
- Children. Young children breathe more frequently than adults.
- Adults with respiratory issues may be more susceptible to rapid onset.
- Older adults may be more likely to have brain damage.

Permanent brain and heart damage can lead to complications years after the poisoning has occurred.

Treatment

CO Poisoning is a life-threatening medical emergency – seek IMMEDIATE medical assistance.

If you suspect you or someone else has been exposed to carbon monoxide, get them into fresh air immediately and seek immediate emergency medical care. Medical staff will want to know the source of the CO, the signs and symptoms and when they started: any mental impairment, confusion, memory problems, loss of consciousness, other medical conditions the person may have. Medical treatment may involve:

- Breathing pure oxygen.
- Spending time in a pressurized oxygen chamber. Hyperbaric oxygen therapy may be used in severe cases of carbon monoxide poisoning or if the person is pregnant.

Prevention

Install a carbon monoxide detector in your home. The simple and common sense prevention is to never run a carbon monoxide producing device in a confined space without proper ventilation.

There are also non-powered detectors that can be placed in automobiles, hotel rooms, etc.

Amateur Radio Operators

How does this apply to amateur radio?

Where can we become exposed to CO while assisting with emergency communications?

FCAA – SFTY 102

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- First consideration is your family/home. You may be away helping someone else so make sure your family members are aware of the danger and how to prevent an incident. Teach them how to safely run a generator and other devices.
- Temporary emergency communication shelters, make sure there is proper ventilation and the generator is far enough away (minimum 20 Ft.) and where the prevailing wind direction is such that you are protected. Some adjustments may need to be made as the wind direction changes.
- In permanent buildings using portable generators, make sure the exhaust does not get pulled in through building vents, windows, etc. Generators should not be placed directly under windows and should be no closer to the structure than 20 feet. Ensure the exhaust is not directed to the building.
- Running you vehicle to charge your battery which is powering your radio. Ensure that there is adequate ventilation. Just running the AC with the fan on high is NOT sufficient ventilation. Crack several windows opposing each other as cross ventilation (changing of the air) is critical. Also ensure the vehicle exhaust is in good repair and that the vehicle is parked where the prevailing wind blows the exhaust away from the vehicle. Consider the use of gel cell battery while operating from my vehicle in a fixed location so that I do not have this concern and to ensure my vehicle will start when I am ready to leave.

The effects of carbon monoxide poisoning have been well understood since 1850. Although there has been an educational effort to the public concerning this silent killer, there are still hundreds of deaths each year. Common sense and providing a warning system are the keys to prevention.

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