

## Carbon Monoxide Poisoning

Carbon monoxide (CO) is a colorless, odorless, toxic gas which interferes with the oxygen-carrying capacity of blood. CO is non-irritating and can overcome persons without warning. Each year, many people die from CO poisoning, usually while using gasoline or gas powered heaters, generators and other such equipment in buildings or semi-enclosed spaces without adequate ventilation.

Carbon monoxide poisoning is the most common type of fatal poisoning in France and the United States. It has been estimated that more than 40,000 people per year seek medical attention for carbon monoxide poisoning in the United States. In many industrialized countries, carbon monoxide may be the cause of greater than 50% of fatal poisonings. In the U.S., about 200 people die each year from carbon monoxide poisoning associated with home fuel-burning heating equipment. The CDC reports, "Each year, more than 500 Americans die from unintentional CO poisoning, and more than 2,000 commit suicide by intentionally poisoning themselves.

### Effects of Carbon Monoxide Poisoning

- Severe carbon monoxide poisoning causes neurological damage, illness, coma and death.

### Symptoms of CO exposure

- Headaches, dizziness and drowsiness.

- Nausea, vomiting, tightness across the chest.

### Some Sources of Exposure

- Portable generators and other such equipment in buildings or other enclosed spaces.
- Space heaters or other devices used to heat enclosed spaces.
- Gasoline powered equipment in or near enclosed spaces.

### Preventing CO Exposure

Prevention remains a vital public health issue, requiring public education on the safe operation of appliances, heaters, fireplaces, and internal-combustion engines, as well as increased emphasis on the installation of carbon monoxide detectors. Carbon monoxide alarms are usually installed in homes around heaters and other equipment. If a high level of CO is detected, the device sounds an alarm, giving people in the area a chance to ventilate the area or safely leave the building. Unlike smoke detectors, they do not need to be placed near ceiling level. The Consumer Product Safety Commission says that "carbon monoxide detectors are as important to home safety as smoke detectors are," and recommends that each home should have at least one carbon monoxide detector. Additional safety measures include:

- Never use a generator indoors or in enclosed or partially enclosed spaces such as garages, crawl spaces, and

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basements. Opening windows and doors in an enclosed space may prevent CO buildup.

- Make sure that generators, heaters and other such equipment have 3-4 feet of clear space on all sides and above it to ensure adequate ventilation.
- Do not use a generator outdoors if placed near doors, windows or vents which could allow CO to enter and build up in occupied spaces.
- When using space heaters and stoves ensure that they are in good working order to reduce CO buildup, and never use in enclosed spaces without adequate ventilation.
- Consider using equipment powered by electricity as an alternative,
- If you experience symptoms of CO poisoning get to fresh air right away and seek immediate medical attention.

### A Few Statistics

Carbon monoxide is life-threatening to humans and other aerobic forms of life, as inhaling even relatively small amounts of it can lead to hypoxic injury, neurological damage, and possibly death. **A concentration of as little as 0.04% (400 parts per million) carbon monoxide in the air can be fatal.** The gas is especially dangerous because it is not easily detected by human senses. One report concluded that carbon monoxide exposure can lead to significant loss of lifespan after exposure due to damage to the heart muscle. The effects produced by carbon monoxide in relation to ambient concentration in parts per million are listed below:

Concentration	Symptoms
35 ppm (0.0035%)	Headache and dizziness within six to eight hours of constant exposure
100 ppm (0.01%)	Slight headache in two to three hours
200 ppm (0.02%)	Slight headache within two to three hours
400 ppm (0.04%)	Frontal headache within one to two hours
1,600 ppm (0.16%)	Dizziness, nausea, and convulsions within 45 minutes. Insensible within two hours.
3,200 ppm (0.32%)	Headache, dizziness and nausea in five to ten minutes. Death within 30 minutes.
6,400 ppm (0.64%)	Headache and dizziness in one to two minutes. Death in less than 20 minutes.
12,800 ppm (1.28%)	Unconsciousness after 2-3 breaths. Death in less than three minutes.