

The Pressure Point

Doctors: Carbon monoxide effects can vary

Some people may be more susceptible to long-term harm from toxic gas

AP Associated Press

Updated: 11:41 a.m. ET Jan. 12, 2006

MORGANTOWN, W.Va. - Catherine Mormile was competing in her third Iditarod race in Alaska when she stopped at a tent along the route to change her wet socks. Minutes later, she felt nauseous. Hours later, she would be unconscious.

"I tried to stand up and I had to hold onto the frame of the tent," she said of her 1994 carbon monoxide poisoning from a propane heater in the unvented tent.

The 51-year-old physical therapist breathed the odorless gas for three hours. She said it took her years to recover. Her IQ plunged. She had to relearn skills such as reading and writing, and said it took longer to recover emotionally.

Randal McCloy Jr., the sole survivor of the Jan. 2 disaster at the Sago Mine, could face similar challenges as he tries to recover from more than 41 hours spent trapped inside the



Dr. Julian Bailes discussing McCloy's condition

mine. A state official has said 11 of his co-workers died from carbon monoxide poisoning, and doctors believe McCloy suffered some brain damage from his exposure.

"He is likely one of the longest survivors of this sort of exposure, not only carbon monoxide, but the other circumstances in the mine," Dr. Julian Bailes, a neurosurgeon treating McCloy, said this week.

On Wednesday, McCloy remained in critical

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Humor Me Corner



Watch when I turn on the bubbles!

Common Carbon Monoxide Poisoning Causes

Everyday sources in everyday life

Carbon monoxide (CO) is formed when organic compounds burn. The most common sources are motor vehicle exhaust, smoke from fires, engine fumes, and nonelectric heaters. CO poisoning is often associated with malfunctioning or obstructed exhaust systems and with suicide attempts.

Sources of carbon monoxide

- Gas water heaters
- Kerosene space heaters
- Charcoal grills
- Hibachi grills
- Propane stoves
- Cigarette smoke



Stoves and burners should be checked

- Propane-fueled forklifts
- Gas-powered concrete saws
- Indoor tractor pulls
- Swimming behind a motorboat
- Spray paint, solvents, degreasers, and paint removers

Doctors: Carbon monoxide effects can vary (continued)

Some people may be more susceptible to long-term harm from toxic gas

(Continued from page 1)

condition. He's still in a coma, and little has changed in several days. Doctors don't seem concerned that the 26-year-old hasn't fully awakened yet and say it could be a lengthy, gradual process.

Several doctors said this week they had never heard of anyone breathing carbon monoxide as long as McCloy and surviving. They note it's possible McCloy also inhaled other toxic gases in the mine as well.

Carbon monoxide is found in combustion fumes, such as a car's engine, and can be poisonous if breathed in closed spaces. Symptoms can include headache, dizziness, weakness, nausea, vomiting, chest pain and confusion, and can vary depending on the concentration and severity of poisoning.

According to the Centers for Disease Control and Prevention, about 500 people die in the United States each year from unintentional carbon monoxide poisoning, and about 2,000 people commit suicide using the gas, often by inhaling car fumes.

When inhaled, it binds with hemoglobin, a substance in the blood that carries oxygen through the body. When carbon monoxide is attached to 10 to 15 percent of the blood's hemoglobin, a person might start feeling dizzy, confused and achy, said Dr. Rutherford Rose, director of the Virginia Poison

Center.

At 30 to 40 percent, a person becomes drowsy, lethargic and can slip into a coma. At 60 to 70 percent, carbon monoxide poisoning becomes fatal, he said.

A note left by miner Jim Bennett included a timeline with a final entry about 10 hours after the blast, his daughter has said. But the timeline seems to add to the confusion about why McCloy survived, and the 11 other trapped miners died.

Rose said it doesn't make sense that McCloy alone would have lived for 30 additional hours, raising the possibility that the other men were alive for 20 to 24 hours after Bennett recorded his last entry.

"They could have been unconscious and certainly breathing for a while, pretty sluggish and out of it, but sort of incapacitated," Rose said.

Studies have suggested such long-term effects as impaired thinking and reasoning, said Dr. Kenneth D. Katz, an assistant professor at the University of Pittsburgh Medical School's department of Emergency Medicine.

"But it's not conclusive," he said, and noted that some people might be more susceptible to long-term harm from the gas. In the case of Mormile, the Iditarod competitor, others had been in the same tent



In more severe cases, patients are often treated in hyperbaric chambers, which forces pressurized oxygen into the body to fight carbon monoxide poisoning.

Common Carbon Monoxide Poisoning Causes (continued)

Everyday sources in everyday life

(Continued from page 1)

Risks for exposure to carbon monoxide

- Children riding in the back of enclosed pickup trucks (particularly high risk)
- Industrial workers at pulp mills, steel foundries, and plants producing formaldehyde or coke
- Personnel at fire scenes
- Using heating sources during power outages
- Those working indoors with combustion engines or combustible gases

Carbon Monoxide Poisoning Symptoms

Exposure to carbon monoxide is most commonly accompanied by the following symptoms:

- Headache
- Dizziness
- Nausea
- Flulike symptoms, fatigue
- Shortness of breath on exertion
- Impaired judgment



Carbon monoxide sensors are life-saving tools that can be installed in many locations around the home, office, and boats.

- Chest pain
- Confusion
- Depression
- Hallucinations
- Agitation
- Vomiting
- Abdominal pain
- Drowsiness
- Visual changes
- Fainting
- Seizure
- Memory and walking problems

Symptoms of Carbon Monoxide (CO) Poisoning

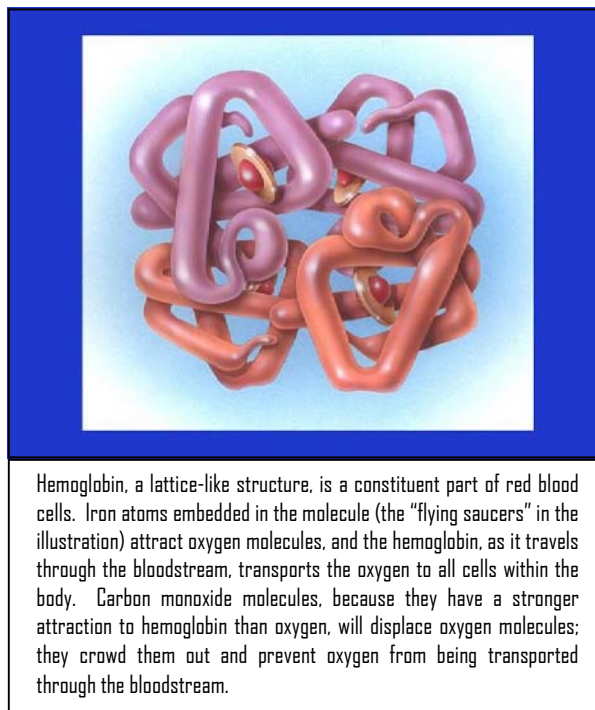
Symptoms mimic the flu

The early effects of CO poisoning mimic the flu, so watch for these warning signs:

- Headache
- Nausea or vomiting
- Dizziness and disorientation
- Muscle weakness or fatigue

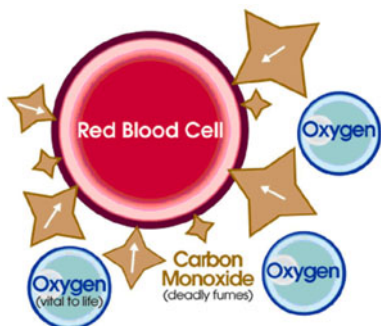
If the flu-like symptoms are NOT accompanied by fever, if everyone in the family is ill, or if the symptoms disappear when you leave the house, you may have a CO problem. *Have your gas appliances checked by a service technician right away.*

It's important to catch CO problems in the early stages. If exposure continues, the poisoning reaches the central nervous system, resulting in memory loss, slurred speech, loss of consciousness and eventually death.



Hemoglobin, a lattice-like structure, is a constituent part of red blood cells. Iron atoms embedded in the molecule (the "flying saucers" in the illustration) attract oxygen molecules, and the hemoglobin, as it travels through the bloodstream, transports the oxygen to all cells within the body. Carbon monoxide molecules, because they have a stronger attraction to hemoglobin than oxygen, will displace oxygen molecules; they crowd them out and prevent oxygen from being transported through the bloodstream.

Carbon monoxide concentrations and effects



- 35 parts per million (ppm) = No adverse effects within eight hours
- 200 ppm = Mild headache after two to three hours of exposure
- 400 ppm = Headache and nausea after one to two hours
- 800 ppm = Headache, nausea and dizziness after 45 minutes; collapse after two hours
- 1000 ppm = Loss of consciousness after one hour
- 1600 ppm = Headache, nausea and dizziness after 20 minutes; unconsciousness after 30 minutes
- 3200 ppm = Headache, nausea and dizziness after 5-10 minutes; unconsciousness after 30 minutes
- 12,800 = Immediate physiological effects; unconsciousness and danger of death after only one to three minutes

CO Toxicity Symptoms:

- Headache
- Nausea or vomiting
- Dizziness and disorientation
- Muscle weakness
- fatigue

“Mundo vitam dare”



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The International Hyperbarics Association, Inc., is a coalition of doctors, parents, patients, corporate chamber-industry professionals, hyperbaric center owners, and above all members who are committed to the cause of medical hyperbarics.

Our members come to us from all geographical areas with one common goal— to share their knowledge and information regarding the latest hyperbaric news. Our driving force is our members, who are committed to do all we can “to give life to the world.”

— “Mundo vitam dare”

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Doctors: Carbon monoxide effects can vary (conclusion)

Some people may be more susceptible to long-term harm from toxic gas

without getting as sick as she did.

Less severe cases can remedy themselves when the source of the carbon monoxide is removed, he said. In more severe cases, patients are often treated in hyperbaric chambers, which forces pressurized oxygen into the body to fight carbon monoxide poisoning.

McCloy was treated in a hyperbaric chamber last week at Pittsburgh's Allegheny General Hospital. Doctors there said the therapy was a supple-

ment to other treatments McCloy is undergoing, and the effects would not be immediately known.

Dr. Richard Moon, the director of the Hyperbaric Center at Duke University Medical Center, said there is strong evidence that using the hyperbaric treatments can stave off long-term effects. But he said those treatments must happen early on, because often those poisoned by carbon monoxide can experience bumps in their recovery.