
Report on Carbon Monoxide Air Pollution Issue in United State

Introduction

The Clean Air Act requires United States Environmental Protection Agency (EPA) to set national ambient air quality standards (NAAQS) for carbon monoxide and five other pollutants considered harmful to public health and the environment (the other pollutants are ozone, particulate matter, nitrogen oxides, sulfur dioxide and lead). The law also requires EPA to periodically review the standards to ensure that they provide adequate health and environmental protection. Using a nationwide network of monitoring sites, EPA has developed ambient air quality trends for carbon monoxide (CO). Under the Clean Air Act, EPA sets and reviews national air quality standards for CO. Air quality monitors measure concentrations of CO throughout the country. EPA, state, tribal and local agencies use that data to ensure that CO remains at levels that protect public health and the environment. Nationally, average CO concentrations have decreased substantially over the years (EPA)

What is Carbon Monoxide

It is called "Invisible Killer" because CO is a colorless, tasteless, odorless nonirritating gas produced when sources of carbon, such as fuels or wood are burned. Some people get confused between carbon monoxide (CO) and carbon dioxide (CO₂). Carbon Monoxide is a POISON, even at low levels and Carbon dioxide is the gas exhaled with normal breathing. Carbon dioxide is an asphyxiant and can be poisonous too.

Effects

Hemoglobin is the molecule in red blood cells that carries oxygen from the lungs to tissues all over the body, and it brings carbon dioxide (CO₂) back from the tissues. CO binds to hemoglobin over 200 times more easily than oxygen does, so if CO is present, oxygen will not be able to find space to get into the hemoglobin. This is because the space is occupied with CO. As a result, parts of the body will be starved of oxygen, and the affected parts will die. The human body needs oxygen, but it has no use for CO. If we breathe in CO, it provides no benefit, but it deprives the blood of oxygen. Vitas Gerulaitis, the tennis star, died of CO poisoning in 1994. His cottage in Long Island, NY, was filled with CO because of a fault in the swimming pool heater. A person who is exposed to CO may notice that something is wrong, but they may not know where the symptoms are coming from (Christian Nordqvist, 2017).

The most common question asks who is at risk from CO poisoning; the answer is everyone is at risk for CO poisoning. Infants, the elderly, people with chronic heart disease, anemia, or breathing problems are more likely to get sick from CO. Each year, more than 400 Americans die from unintentional CO poisoning not linked to fires, more than 20,000 visit the emergency room, and more than 4,000 are hospitalized. And, cold weather hazard and warm weather hazard can cause CO poisoning because of insufficient ventilation and poor ventilation for example, Gas or kerosene heater in room without proper ventilation and Gas-fueled lanterns and stoves burned

inside a tent, trailer, boat cabin without proper ventilation

Symptoms

The person may feel as if they have the flu, but without a temperature. If several people in the same building have the same symptoms, they may have CO poisoning. If this happens, all cooking and heating appliances should be switched off, all windows opened, and the local gas safety authorities notified. The longer an individual is exposed to CO, the more severe the symptoms will become. Within a few hours of first being exposed, a person may experience:

- loss of balance
- vision problems
- memory problems
- eventual loss of consciousness

If the symptoms are mild, there is a very chance of a full recovery. Other symptoms may occur later, even months after inhaling CO gas. These include:

- confusion
- memory problems
- coordination difficulties

Serious CO gas poisoning can cause long-term problems, including heart damage. People with heart-related or breathing problems tend to be affected more quickly by CO gas poisoning. Pregnant women, babies, and small children are also more susceptible. Pets, too, will react quickly to CO poisoning. If a family pet suddenly gets ill or unexpectedly dies, and the death cannot be linked to anything else, such as age or an existing condition, the owners should try to rule out CO poisoning as one of the possible causes (Christian Nordqvist,2017)

How Co Works Inside the Body

How CO poisoning work, Enters the body through the lungs and is delivered to the blood and Red blood cells pick up CO instead of oxygen and Hemoglobin likes CO 250 times more than oxygen and CO prevents the oxygen that is present from being readily released to and used properly by tissues.

Causes

Household appliances, such as gas fires, boilers, central heating systems, water heaters, cookers, and open fires which use gas, oil, coal and wood may be possible sources of CO gas. It happens when the fuel does not burn fully. Running a car engine in an enclosed space can cause CO poisoning. If household appliances are well serviced and used safely, they should produce negligible quantities of CO gas. Using old appliances, and not servicing them frequently, leads to a higher risk of CO emission. Here are some other causes of CO gas emission and buildup:

- Smoking cigarettes causes blood levels of CO to rise.
- Leaving a car in a closed garage with its engine running can produce deadly amounts of

CO within 10 minutes.

- Burning charcoal produces CO gas.
- Blocked flues and chimneys can stop CO from escaping.
- Fumes from certain paint removers and cleaning fluids can cause CO poisoning.
- Products that contain methylene chloride (dichloromethane) should be handled with care, because methylene chloride turns into CO when it is breathed in. (Christian Nordqvist,2017)

In the US, the most common causes of CO poisoning come from engine driven tools at 42%. Heating systems were next with 34% followed by consumer products at 19% and other multiple products at seven percent. Additional CO poisoning stats: There is an average of 439 deaths per year from accidental, non-fire-related CO poisoning. Poison control centers get more than 680 calls per year about CO poisoning on average. Fire departments responded to an average of 72,000 CO poisoning incidents each year between 2006 and 2010. No one is immune to the dangers of CO poisoning.

Diagnosis

It is important to be aware of the possible signs of CO poisoning. These include: a large proportion of people in the same environment developing the same symptoms. symptoms improving when a person is away from that environment and reappearing when they return. Seasonal symptoms, which may be caused by a central heating system that is used only at certain times of the year. A physician may request a blood test to detect unusual levels of carboxyhemoglobin and perhaps an electrocardiogram (ECG) assess how well the heart is pumping blood around the body(Christian Nordqvist,2017)

Treatment

The antidote to carbon monoxide poisoning is 100% oxygen administered by the trachea Tight tube or mask. You should perform a heart monitor and treat any arrhythmias. Hypotension should be corrected by intravenous administration of normal saline. If highly poisoned animals should be examined and treated for lactic acidosis Necessary. Animals that arrive in an emergency from closed space fires with marked Metabolic acidosis or elevated lactate levels should also be assessed for possible cyanide-associated toxicity. The use of 100% oxygen facilitates the dissolution of carbon monoxide from hemoglobin. The half-life of carbon monoxide is reduced from more than 240 minutes in room air to 60 minutes when 100% oxygen is delivered via the tracheal tube. 100% management Oxygen should not be used for more than 18 hours to prevent subsequent oxygen Toxicity.

It is believed that this syndrome is caused by the formation of oxygen radicals Endothelial and epithelial cells are damaged directly leading to cyto Toxicity, increased endothelial permeability, and subsequent inflammation of the tissues. For most mammalian species, it was discovered that long exposure (24 hours or more) to high concentrations Oxygen damages the lungs. For these reasons, the use of oxygen must be 100% Monitor wisely. The use of 100% oxygen administered more than atmospheric pressure (i.e., high-pressure oxygen) can shorten the half-life to approximately 23 minutes. In many studies High-pressure oxygen benefits the brain more than normal oxygen, because it improves Energy metabolism, inhibits lipid peroxide, reduces neutrophil adherence. in a Treatment of high-pressure oxygen in humans is the treatment of

choice for patients with acute poisoning By carbon monoxide.

Disadvantages of high-pressure oxygen include associated risks Transfer to treatment centers, initiate seizures of hyperoxygenation, and ototoxicity. In this time These techniques are not widely available in veterinary medicine. Carbon seizures Monoxide poisoning can be treated with appropriate anticonvulsants. In 1922, high blood pressure caused by carbon dioxide turned out to be effective in treating carbon monoxide poisoning. The technique fell in disrepute in the 1960s with the advent Specific toxic substances Successful treatment of high-pressure oxygen monoxide poisoning. Recently, Hypertension eucapnic hyperoxia has been shown to increase the elimination of carbon monoxide In dogs and humans two to three times the normal breathing of 100% oxygen. With appropriate equipment, this technique can be applied at the time and location of the site using a portable circuit. Provide more rapid disposal of carbon monoxide earlier In the course of treatment of this poisoning can significantly improve the diagnosis. Because High-pressure chambers are still relatively rare (only 340 in the US) and not easily Available to veterinary patients, this method of treatment deserves a serious reassessment. Finally, the correction of any essential blood acid with bicarbonate is controversial because Further secondary cellular hypoxia can lead to the left shift of oxyhemoglobin Disintegration curve. At this time it is not recommended as part of the treatment regimen

Prevention

According to CDC The Centers for Disease Control and Prevention is the leading national public health institute of the United States. The CDC is a United States federal agency under the Department of Health and Human Services and is headquartered in Atlanta, Georgia. There are some tips recommend controlling and prevention CO. first Install a battery-operated or battery back-up CO detector in your home and check or replace the battery when you change the time on your clocks each spring and fall. second Place your detector where it will wake you up if it alarms, such as outside your bedroom. Consider buying a detector with a digital readout. Third This detector can tell you the highest level of CO concentration in your home in addition to alarming. 4th, Replace your CO detector every five years.

Have your heating system, water heater, and any other gas, oil, or coal burning appliances serviced by a qualified technician every year. 5th, Do not use portable flameless chemical heaters indoors. 6th, If you smell an odor from your gas refrigerator have an expert service, it. An odor from your gas refrigerator can mean it could be leaking CO. 7th When you buy gas equipment, buy only equipment carrying the seal of a national testing agency, such as Underwriters' Laboratories. 8th Make sure your gas appliances are vented properly. 9th, Horizontal vent pipes for appliances, such as a water heater, should go up slightly as they go toward outdoors, as shown below. 10th, This prevents CO from leaking if the joints or pipes aren't fitted tightly. 11th, Have your chimney checked or cleaned every year. Chimneys can be blocked by debris. 12th, This can cause CO to build up inside your home or cabin. 13th, Never patch a vent pipe with tape, gum, or something else. 14th, This kind of patch can make CO build up in your home, cabin, or camper. 15th, Never use a gas range or oven for heating. Using a gas range or oven for heating can cause a buildup of CO inside your home, cabin, or camper. 16th, Never burn charcoal indoors. Burning charcoal – red, gray, black, or white – gives off CO. 17th, Never use a portable gas camp stove indoors. 18th, Using a gas camp stove indoors can cause CO to build up inside your home, cabin, or camper. 19th, Never use a generator inside your home, basement, or garage or less than 20 feet from any window, door, or vent. 20th,

When using a generator, use a battery-powered or battery backup CO detector in your home.

United State Role to Reduce Carbon Monoxide

Consumer Product Safety Commission staff worked closely with Underwriters Laboratories (UL) to help develop the safety standard (UL 2034) for carbon monoxide alarms. CPSC helps enhance carbon monoxide safety by raising awareness of the dangers of carbon dioxide and the need for proper use and regular maintenance of fuel burners. CPSC employees also work with stakeholders to develop voluntary and mandatory standards for fuel burners and to conduct independent research into the performance of CO2 alarms under potential domestic use conditions and also, they establish The environmental protection agency promulgated national ambient air quality standards for carbon monoxide under section 109 of clean air act.

Conclusion

Carbon monoxide (CO) may be the cause of more than half of reported fatal poisonings in many countries: fatal cases are reported fatal or misdiagnosed by medical professionals. Therefore, the exact number of individuals who have suffered carbon dioxide poisoning is unknown. The health effects associated with exposure to carbon dioxide range from more accurate cardiovascular and neurological behavioral effects at low concentrations to loss of consciousness and death after acute or chronic exposure to higher concentrations of carbon dioxide.

The morbidity and mortality resulting from recent exposure is described briefly to complete the image of CO exposure in the society at present. Symptoms, signs and diagnosis of acute carbon monoxide poisoning are weakly associated with the level of carboxyhemoglobin (COHb) measured at the time of hospitalization; In shady places. Early symptoms (headache, dizziness, weakness, nausea, confusion, confusion, visual disturbances) should also be emphasized, especially if they recur periodically or in the same environment. Complications occur frequently in carbon monoxide poisoning. Immediate death is probably the heart originally because myocardial tissue is most sensitive to the effects of hypoxia of CO. Acute poisoning leads to marked hypertension, fatal arrhythmia, electrocardiogram changes. Pulmonary edema may occur. Neurological manifestations of acute carbon monoxide poisoning include confusion, confusion and coma.

Perhaps the most treacherous effect of cerebral palsy poisoning is the development of neuropsychiatric weakness within 2 - 28 days after poisoning and slow resolution of the consequences of neurological behavior. Carbon monoxide poisoning during pregnancy increases the risk of maternal infection by increasing the rate of short-term complications of the fetus by causing fetal death, developmental disorders and chronic brain lesions. Finally. Carbon monoxide poisoning occurs frequently. It has serious consequences, including immediate death; entails complications and delayed consequences; and is often overlooked. Efforts in prevention and in general and medical education should be encouraged.