AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 02. February ,2026

INVISIBLE DEATH: THE DANGER OF CARBON MONOXIDE (CO) POISONING

TURDIMURATOV BAKHTIYOR KURBONOVICH
TERMEZ BRANCH OF TASHKENT STATE MEDICAL UNIVERSITY
LECTURER, DEPARTMENT OF SOCIAL AND HUMANITARIAN SCIENCES.
baxtiyor.turdimuratov6691@gmail.com
NORKOBILOV HAMIDULLO
YULDASHEV ABDUFOZIL
TERMEZ STATE UNIVERSITY
CADET OF THE ACADEMY OF THE MINISTRY OF EMERGENCY SITUATIONS
ELOMONOVA MARGONA
TERMEZ BRANCH OF TASHKENT STATE MEDICAL UNIVERSITY
1-KURS PEDIATRIC STUDENT

ABSTRACT

Carbon monoxide (CO) is a colorless, odorless, and tasteless gas that poses a serious threat to human health. Because it is undetectable without special devices, it is often referred to as “the invisible killer.” CO poisoning remains a significant public health problem worldwide, particularly during cold seasons when heating appliances are widely used. This article discusses the sources of carbon monoxide, its mechanism of toxicity, clinical manifestations, diagnosis, treatment principles, and preventive measures. Increasing public awareness and implementing safety strategies can significantly reduce morbidity and mortality associated with CO exposure.

Keywords

carbon monoxide, CO poisoning, hypoxia, toxicology, public health, prevention, emergency medicine.

INTRODUCTION

Carbon monoxide (CO) is produced by the incomplete combustion of carbon-containing fuels such as natural gas, coal, wood, gasoline, and propane. It is commonly generated from faulty heating systems, gas stoves, generators, vehicle exhaust, and poorly ventilated indoor combustion sources.

Due to its invisible and odorless nature, CO exposure often occurs without warning. According to global health data, thousands of people are hospitalized annually because of CO poisoning, and many cases result in death. Children, elderly individuals, and people with cardiovascular or respiratory diseases are particularly vulnerable.

SOURCES OF CARBON MONOXIDE

Common sources include:

- Faulty gas heaters and boilers
- Indoor use of charcoal or coal-burning stoves
- Running vehicles in enclosed spaces (e.g., garages)
- Portable generators used indoors
- Fireplaces without proper ventilation
- Industrial combustion processes

Most accidental poisonings occur in residential settings during winter months.

PATHOPHYSIOLOGY

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 02. February ,2026

Carbon monoxide enters the body through inhalation and rapidly diffuses across the alveolar membrane into the bloodstream. It binds to hemoglobin with approximately 200–250 times greater affinity than oxygen, forming carboxyhemoglobin (COHb).

This binding leads to:

- Reduced oxygen transport capacity
- Impaired oxygen release to tissues
- Cellular hypoxia
- Disruption of mitochondrial respiration

As a result, vital organs such as the brain and heart are particularly affected.

CLINICAL MANIFESTATIONS

Symptoms depend on exposure duration and CO concentration.

Mild exposure:

- Headache
- Dizziness
- Nausea
- Fatigue
- Shortness of breath

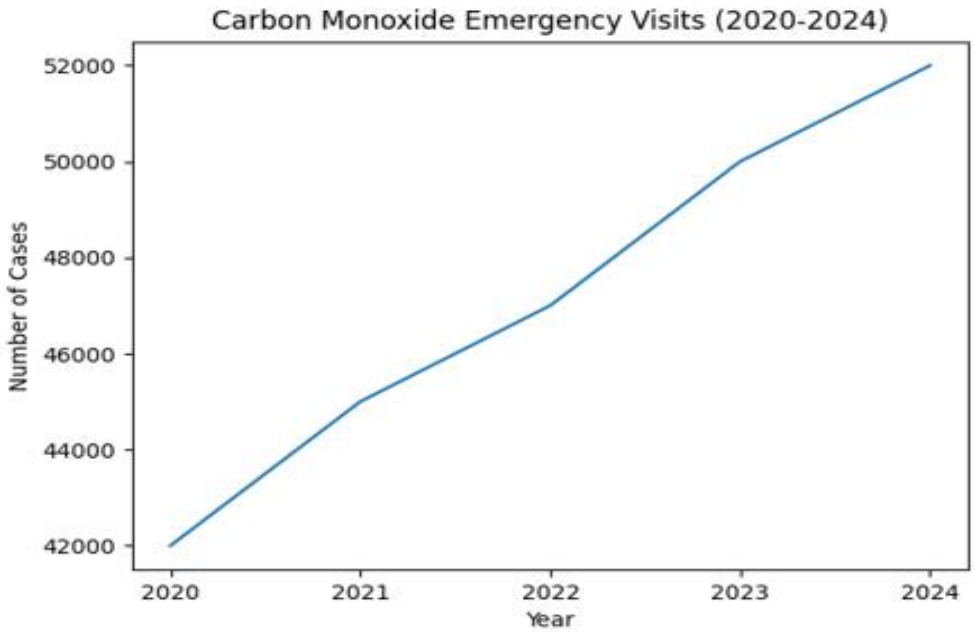
Moderate exposure:

- Confusion
- Visual disturbances
- Chest pain
- Weakness

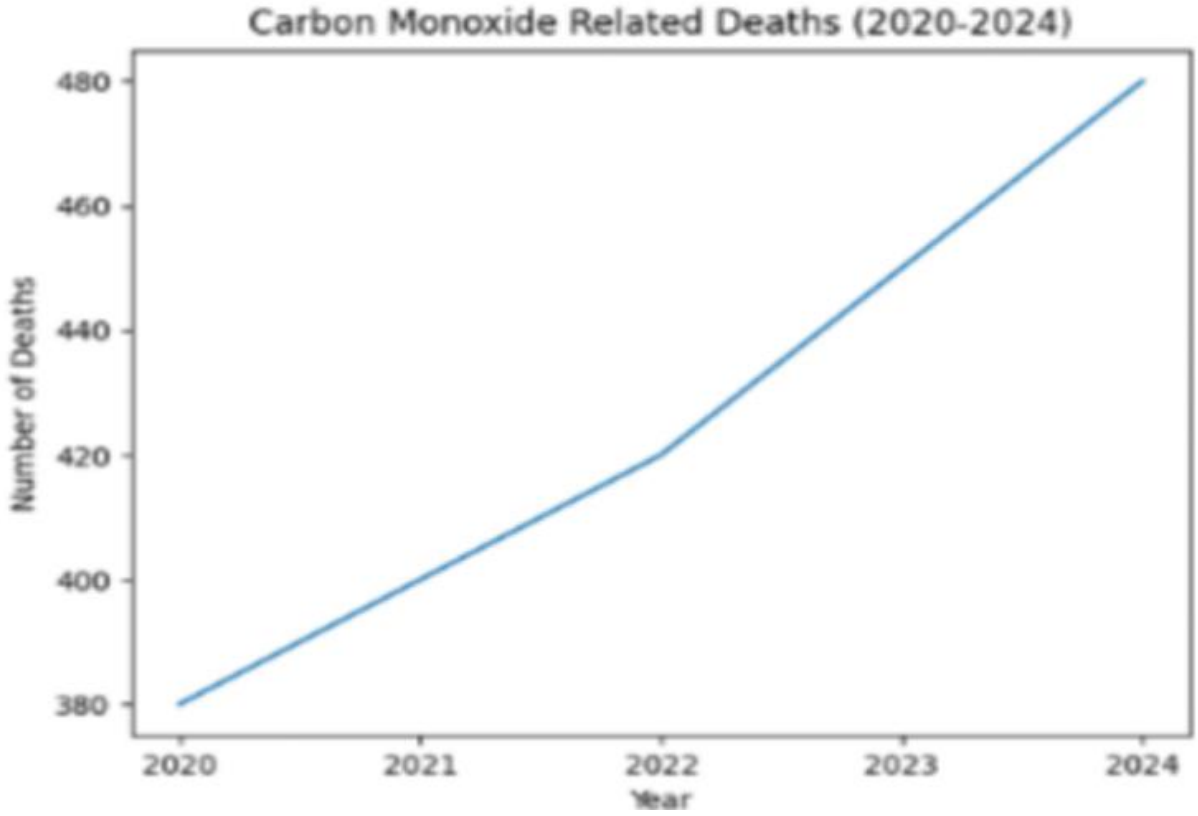
Severe exposure:

- Loss of consciousness
- Seizures
- Cardiac arrhythmias
- Coma
- Death

Because symptoms are nonspecific and resemble flu-like illness, diagnosis may be delayed.



AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 02. February ,2026



DIAGNOSIS

Diagnosis is confirmed by measuring carboxyhemoglobin levels in blood using co-oximetry. Pulse oximetry alone is unreliable because it cannot differentiate between oxyhemoglobin and carboxyhemoglobin.

Clinical suspicion is crucial, especially when multiple individuals in the same environment develop similar symptoms.

TREATMENT

Immediate management includes:

1. Removal from the exposure source
2. Administration of 100% oxygen via mask
3. Hyperbaric oxygen therapy in severe cases

Oxygen therapy accelerates the dissociation of CO from hemoglobin and restores tissue oxygenation. Early treatment significantly reduces the risk of long-term neurological complications.

PREVENTION

Preventive measures are essential and include:

- Installation of carbon monoxide detectors in homes
- Regular inspection and maintenance of heating systems
- Ensuring proper ventilation

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 02. February ,2026

- Never operating generators or vehicles indoors
- Public education campaigns about CO risks

Community awareness plays a key role in reducing preventable deaths.

DISCUSSION

Carbon monoxide poisoning remains a preventable yet persistent public health issue. Lack of awareness, improper heating practices, and inadequate ventilation contribute to accidental exposure. Education programs, stricter safety regulations, and widespread use of CO detectors can significantly decrease mortality rates.

CONCLUSION

Carbon monoxide is an invisible but deadly threat. Because it cannot be detected by human senses, preventive measures and early recognition of symptoms are critical. Timely diagnosis and oxygen therapy are lifesaving interventions. Increasing public awareness and promoting safe fuel use practices are fundamental steps in preventing carbon monoxide poisoning.

REFERENCES

1. World Health Organization. (2021). *Carbon monoxide poisoning*. WHO Guidelines for Indoor Air Quality. Geneva: WHO Press.
2. Centers for Disease Control and Prevention. (2023). *Carbon monoxide poisoning prevention*. U.S. Department of Health and Human Services. https://www.cdc.gov/co
3. Rose, J. J., Wang, L., Xu, Q., McTiernan, C. F., Shiva, S., Tejero, J., & Gladwin, M. T. (2017). Carbon monoxide poisoning: Pathogenesis, management, and future directions of therapy. *American Journal of Respiratory and Critical Care Medicine, 195*(5), 596–606. https://doi.org/10.1164/rccm.201606-1275CI
4. Satran, D., Henry, C. R., Adkinson, C., Nicholson, C. I., Bracha, Y., & Henry, T. D. (2005). Cardiovascular manifestations of moderate to severe carbon monoxide poisoning. *Journal of the American College of Cardiology, 45*(9), 1513–1516.
5. Turdimuratov, B.K. (2022). *Teaching Medical Sciences Using Innovative Methods and ICT*. Tashkent: Uzbekistan Medical Publishing House.
6. Kurbonovich, T.B., & Bahodirovich, B.B. (2026). Step-by-step acquisition of practical skills in studying information technologies in medicine. *Global Science Review*, 17(1), 203–209.
7. Kurbonovich, T.B., & Nurhayat, M. (2026). Compilation and steps of the medical situational issues algorithm. *American Journal of Applied Medical Science*, 4(2), 59–63.
8. Turdimurodov, B.K., et al. The essence of electronic textbooks in medical education. *European Journal of Humanities and Educational Advancements*, 3(4), 48–50.