Carbon Monoxide

THE "INVISIBLE KILLER"
7710 is the premiere provider of Workers’ Compensation Insurance for Firefighters and EMS. Built by first responders, for first responders.
Course Objectives

• Define carbon monoxide
• Describe possible sources
• Identify carbon monoxide poisoning signs and symptoms
• Understand who is at risk for poisoning
• Describe key prevention tips and available resources
• Recognize Poison Center Services
What Is Carbon Monoxide?

CO is a colorless, tasteless, odorless non-irritating gas produced when sources of carbon, such as fuels or wood are burned.

Because carbon monoxide is essentially invisible, it is known as the "invisible killer."
# Carbon Monoxide VS Carbon Dioxide

<table>
<thead>
<tr>
<th>Carbon Monoxide</th>
<th>Carbon Dioxide</th>
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<tbody>
<tr>
<td>A byproduct of burning fuels</td>
<td>Gas exhaled with normal breathing</td>
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<tr>
<td>A poison even at low doses</td>
<td>An asphyxiate and poisonous at high doses</td>
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Who Is At Risk?

EVERYONE is at risk, especially:

- People using alternate heat sources during power outages
- The elderly
- Unborn babies, infants
- Pets
- Individuals with chronic heart disease, anemia or respiratory problems
Who Is At Risk?

• Personnel at fire scenes (fire-fighters/rescue workers)
• Individuals working with combustion engines or combustible gases indoors
• Industrial workers at pulp mills, steel foundries and plants producing formaldehyde and coke
Is CO Poisoning Common?

• One of the leading causes of unintentional/accidental poisoning deaths in the United States

• Poisonings occur more often in the fall and winter months

• Accounts for approximately 50,000 emergency department visits each year in the U.S.
Sources

Burning fuels such as:
• Wood
• Oil
• Natural gas
• Gasoline
• Kerosene
• Propane
• Coal
• Diesel

Common sources of human exposure:
• Smoke inhalation from fires
• Automobile exhaust
• Faulty or poorly vented charcoal, kerosene or gas stoves
• To a lesser extent, cigarette smoke and methylene chloride (industrial uses)

Electrical appliances do not produce CO
Cold Weather Hazards

Insufficient ventilation

• Generators used inside during a power outage
• Gas or kerosene heater in room without proper ventilation
• Stoves or fireplaces that are improperly vented or blocked
• Exhaust flues or appliance ducts that are blocked or sealed shut
• Cars or trucks idling in a garage

Opening a door or window is not sufficient
Cold Weather Hazards

Poor function or worn parts
• Appliances and equipment
• Heating systems

Improper usage
• Using charcoal grills indoors
• Heating homes with gas ovens
Warm Weather Hazards

• Enclosed area (poor ventilation)
• Gas, kerosene, charcoal, propane or hibachi grills
• Gasoline-powered equipment (lawnmower, chainsaw, generator,) used in a home, garage or under a tarp
• Gas-fueled lanterns and stoves burned inside a tent, trailer, boat cabin without proper ventilation
Warm Weather Hazards

• Excessive inhalation of exhaust fumes
• Teak surfing or pulling a skier from a boat’s diving platform
• Diving from or swimming near a houseboat platform
• Riding in the back of a pickup truck with a camper shell
How Does Carbon Monoxide Poisoning Occur?

- Enters the body through the lungs and is delivered to the blood
- Red blood cells pick up CO instead of oxygen
- Hemoglobin likes CO 250 times more than oxygen
- CO prevents the oxygen that is present from being readily released to and used properly by tissues
What Happens When We Don’t Have Oxygen?

Can only live a few minutes without oxygen

- Vital organs such as the brain and heart need oxygen
- Brain damage
- Organ damage
- Possibly death
Toxic Events = Concentration x Exposure

Long-term exposure to low levels of CO

Short-term exposure to high levels of CO

Both types of exposure possess their own inherent DANGERS
Signs And Symptoms of CO Poisoning

Flu-like symptoms (without fever or runny nose) including:

- Headache
- Fatigue/sleepiness
- Shortness of breath
- Nausea
- Dizziness
- Confusion or disorientation

Young children, elderly and household pets are usually effected first
Failure To Detect Danger

- Often mistaken for the flu, food poisoning or other illnesses.
- Those sleeping or intoxicated can die before experiencing any symptoms.
- Prolonged exposure can lead to brain damage and death.
- Victims may become disoriented and unable to save themselves.
CO Poisoning Prognosis

- Difficult to predict the long-term effects of CO poisoning/exposure
- Even with proper medical treatment some people can develop long-term brain damage.
- If pregnant, fetal complications or death may result.
- Some individuals appear to have no long-term affects.
Carbon Monoxide Alarm

Install a carbon monoxide alarm close to sleeping areas. For more protection:

• Install one in every bedroom
• Install one on every level of your home
• Never ignore a carbon monoxide alarm, IT COULD SAVE A LIFE!
Buying An Alarm

• Do not buy based on price.
• Purchase with Underwriters Laboratories (UL 2034) label.
• Contact Consumer Product Safety Commission (CPSC) for assistance.
• Follow manufacturer’s instructions for placement, use and maintenance.
Maintaining Alarms

If battery powered:

• Check monthly

• Replace batteries every year or when batteries are low

• If electric, make sure there is battery backup in case of power outages.
Emergency – When the Alarm Sounds!

- Get fresh air right away
- Call 911 or your local fire department
- Call the local Poison Control Center
- Do not re-enter an affected home until CO is gone
- Fire department can determine when it is safe to re-enter a building
Fire Department / EMS’s Role?

- Rescue victims
- Find source of CO
- Utilize special detectors that monitor small amounts of CO (parts per million/PPM) in the atmosphere at any given location.

If CO is detected:

- The source will be investigated and identified
- Next steps will be recommend.
- The area will be ventilated until CO levels are safe.
Prevention Tips

• Purchase CO alarms.
• Install and maintain according to manufacturer’s instructions.
• If CO alarm goes off, evacuate home immediately and call 911.
• Know signs and symptoms of CO poisoning.
• Professionally install & annually inspect appliances & heating systems.
• Open the flue when using a fireplace.
• Make sure stove pipes and other vents are joined tightly without cracks or rust.
Prevention Tips Don'ts

- Never run a portable generator, gasoline-powered engines (such as mowers, snow-blowers, chainsaws) or burn charcoal in:
  - Crawlspaces
  - Indoors
  - Garages
  - Basements
  - Closed in porch
  - Vehicle
  - Tent
  - Under windows

- Never leave a car, mower or other vehicle running in a garage, even with the door open.

- Do not heat a home with a gas oven.
Visual Warning Signs

• Streaks of carbon or soot around door of your fuel-burning appliance.
• A large amount of rusting on flue pipes or appliance jackets or vent pipes.
• Moisture on windows/walls of furnace doors.
• Flu-like symptoms that go away when you leave home and come back when you re-enter.
Visual Warning Signs - Fireplaces

- Discolored or damage bricks at top of chimney.
- Soot falling from fireplace.
- No draft in your chimney.
Network Types Of Calls

- Poison emergencies/exposures
- Poison related questions and information
- Medication identification
- Substance abuse and medication information
- Health care professional treatment consultation
Additional Resources

Environmental Protection Agency
Information Clearinghouse (EPA)

Information on indoor air quality
1-800-438-4318
www.epa.gov/iaq/iaqinfo.html

Consumer Product Safety Commission
(CPSC)

Information on CO poisoning prevention,
purchasing a CO alarm & report products or
product-related injuries
1-800-638-2772 (TTY 1-800-638-8270)
info@cpcs.gov
More Resources

Centers for Disease Control (CDC)
How to prevent poisoning from home appliances
www.cdc.gov/co/faqs.htm

National Institute for Occupational Safety Health (NIOSH)
Information about small engine hazards
www.cdc.gov/niosh/homepage.html

National Institute of Health and Library or Medicine (NLM)
General Information
nlm.nih.gov/medlineplus/print/carbonmonoxidepoisoning.html
Thank you.

PLEASE CONTACT US WITH ANY QUESTIONS.

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