

# NH VT Carbon Monoxide Alliance

CO – The Silent Killer  
Carbon Monoxide & Detection

# CARBON MONOXIDE

- Each year our residents and visitors face the risk of Carbon Monoxide poisoning through improperly installed, poorly maintained or defective and aging venting systems.
- The CO Alliance seeks to perform research in order to collectively educate the public about this health risk

# Non-Fire Carbon Monoxide Incidents 2003-2010

- Source: *Non-Fire Carbon Monoxide Incidents*, Ben Evarts, NFPA Fire Analysis and Research, Quincy, MA, March 2012
- During period of 2006-2010, an estimated 72,000 non-fire carbon monoxide incidents were reported to U.S. fire departments each year: These incidents have been increasing over time.

# Carbon Monoxide

- These incidents are more common between the months of November and February
- Most incidents (94%) occur in residential properties, with 73% in one or two family homes
- Carbon monoxide alarms are more common in the early evening hours, peaking around 8:00 p.m.
- In 2008, there were an estimated 189 carbon monoxide poisoning deaths associated with the use of a consumer product in the U.S.

# Carbon Monoxide

- The State of New Hampshire remains unique in the fact that a majority of their structure fires and carbon monoxide incidents can be attributed to heating systems or appliances.
- What we share with every state is that many of these incidents can be prevented by installation of smoke and carbon monoxide alarms.

# CARBON MONOXIDE

- **Carbon Monoxide:** CO is the chemical abbreviation for Carbon Monoxide.
- CO is the #1 cause of gas poisoning in the US.
- CO is colorless, tasteless, odorless gas and cannot be noticed by humans or pets.
- Deserves the name - “The Silent Killer”

# Effects of Carbon Monoxide

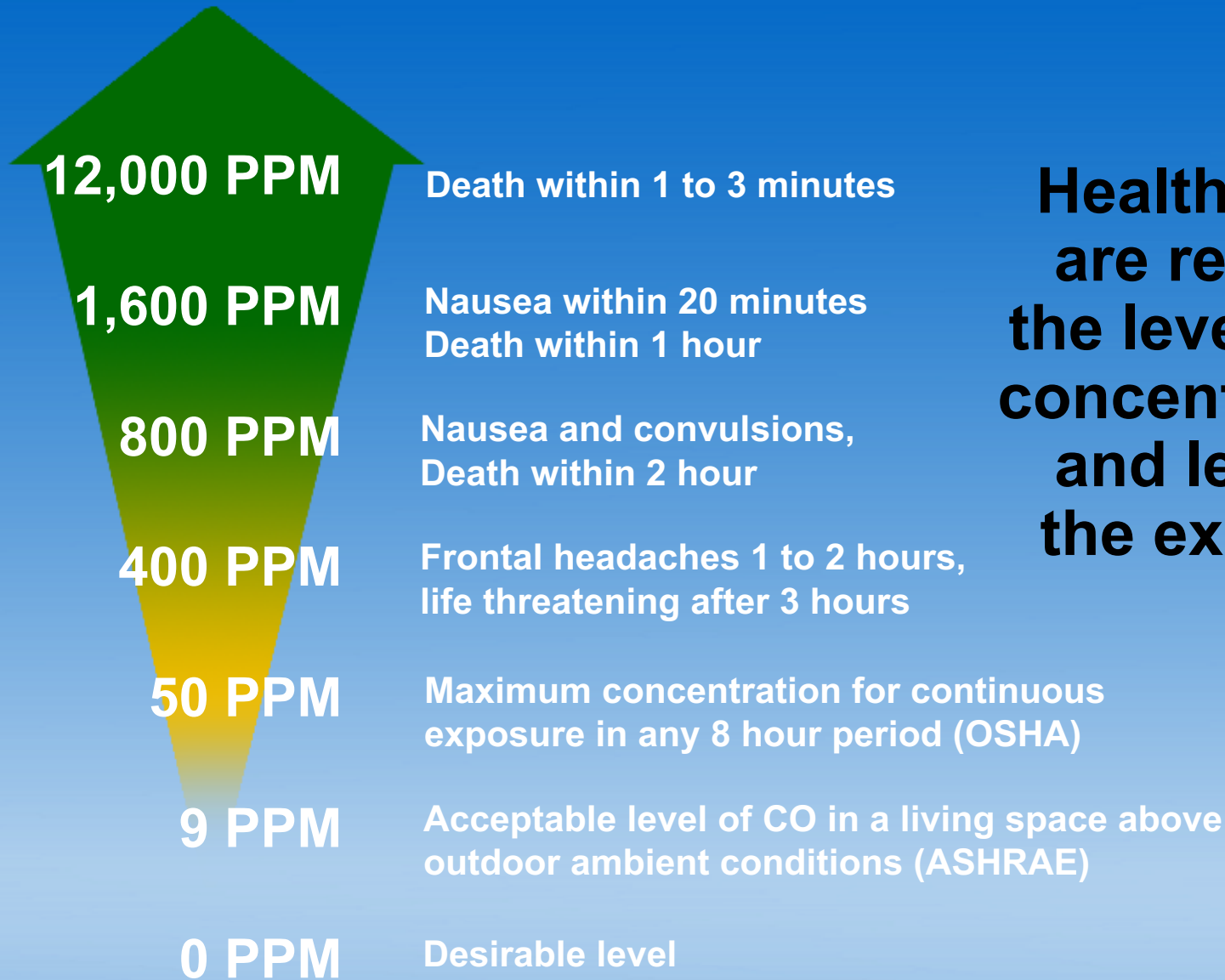
- As many as 15,000 hospital visits per year
- About 2,100 unintentional deaths per year
  - Journal of the American Medical Association
  - US Consumer Product Safety Commission
- Different concentrations and durations of CO exposure have different effects on the human body

# CARBON MONOXIDE

- Product of Combustion in ALL fossil fuels
- Displaces the O<sub>2</sub> in red blood cells 200/1
- Up to 9% found in heavy smokers
- 15% Mild Headaches / Flu like symptoms
- 25% Nausea, Severe Headaches, Pink Skin
- Prolonged exposure resulting in death



# CARBON MONOXIDE



**Health effects  
are related to  
the level of CO  
concentrations  
and length of  
the exposure.**

# Common Causes of CO in Homes

- Automobile left running in garage
- Faulty Appliances
  - Improper Combustion Air
  - Improper Fuel/Air Ratio
  - Improper Ventilation
  - Equipment Failure or Maintenance
- Space Heaters, Wood Stoves & Fireplaces
- Outdoor Equipment used Indoors

# CO Sources & Efficiency Effects

- Small amounts of CO may not be a great threat or immediately detected, but may result in health issues.
- The toxic gases are constantly being diluted with fresh air, but because of modern building design and life styles, we live in a mini ecosystem.
- Today's buildings are more air tight with little or no dilution of inside air pollutants...and poisons.

# Common Venting System Causes

- 1 Not Following Manufacturers Installation Instructions**
- 2 Incorrect Material Selection**
- 3 Inaccessibility for Inspection**
- 4 Insufficient Number or Placement of Drains**
- 5 Inadequate Straight Line Pitch**
- 6 Too Many Elbows**
- 7 Low Spots in Appliance Tie-Ins**
- 8 Inadequate Physical Support of System**
- 9 Sealed Incorrectly**

# CO Lives Lost in NH

- 2009 Father & Son (Oil Boiler) Maintenance
- 2010 Son Sleeping in Basement (Vent System Installation Failure)
- 2014 3 Dead & 1 Severely Injured (Installation Error & Subsequent Failure)
- 2015 1 Dead (Pipe Separation & Installation Errors)
- 2016 1 Dead (Oil Burner Malfunction)

# CO Lives Lost in NH

- The single common denominator was the fact that none of these dwellings had a working carbon monoxide alarm that would have provided occupant notification that deadly levels of carbon monoxide gasses were building in their residences
- Presently NH laws require the installation of CO alarms and does not require them to be verified as operational before a home is sold

# How NH Has Responded

- 2015 NH State Fire Marshal J. William Degan was one of the first charter members of the CO Alliance
- Their participation has grown to include; a district Chief from the Bureau of Investigations, the Chief Mechanical Inspector, and a Public Education Specialist who have dedicated their combined efforts to public safety and CO prevention and detection.

# How NH Has Responded

- 2015 The NH Board of Fire Control amended the NH State Fire Safety Code which now requires our licensees and installers to select a more resilient type of venting material based on the appliance operating temperature of high efficiency fuel gas appliances.
- This amendment took effect January 1, 2016
- 2016 Training began for some 5,000 NH licensed fuel gas fitters on venting



# How NH Has Responded

- 2016 The NH & VT State Fire Marshal's Office assisted the CO Alliance with fact finding surveys of home owners, heating technicians, and Fire Chiefs in an attempt to obtain information about CO poisoning incident and how the industry and emergency services responds to these events. This information has been instrumental as to how we collectively address the seriousness of this topic.

# Looking Forward

- Our agency will continue to promote CO safety through our public outreach educational programs.
- In addition we will continue to work with code development organizations like ICC & NFPA in an effort to require the addition of a CO alarm when ever a fuel fired appliance is installed or replaced.

# Existing Challenges

- Current Laws, Rules and Codes are not identical in NH & VT
- Battery Operated Fire & CO Alarms in homes do not meet the requirements for alarm systems as required in either state
- Many CO alarms do not measure consistent low level amounts of carbon monoxide in the home

## ***Manufacturer Recommended Installation***

### **Suitable Locations:**

Wall: 5 ft AFF

Ceiling: 1 ft from Wall

### **Residential**

Within each sleeping room, 10ft from each sleeping room, and on each level.

At a minimum outside each sleeping area.

### **Commercial**

On every habitable Level, base design on an engineering evaluation as per NFPA 72 2013.

### **Do Not install:**

5 ft from Cooking Appliance

10 ft from Fuel Burning Appliance

Where restriction or redirection of entry exists



**🔺 CO detector locations**



# How you can help us

- Later today you will be requested to participate in working groups discussing areas of concern for this organization.
- We ask that you all participate vigorously in order for us to capture your ideas of how this organization should and could move forward

QUESTIONS ?

THANK YOU