

DANGERS OF SMOKE!

- CO
- Cyanide
- Carcinogens • Superheated gasses
- PVC
- Methemoglobinemia
- Hydrogen Sulfide
- Ammonia
- Hydrogen Chloride
- Isocyanates



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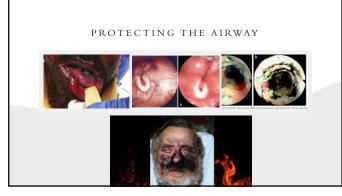
MORE THAN JUST CO

ASPHYXIANTS

- Carbon Dioxide (simple)
- Carbon Monoxide (chemical)
- Hydrogen Cyanide (chemical)
- Hydrogen Sulfide (chemical)
- Oxides of Nitrogen (chemical)

IRRITANTS

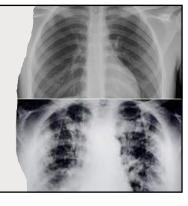
- Ammonia (upper airway- High water Sol)
- Hydrogen Chloride (upper airway)
- Sulfur Dioxide (upper airway)
- Chlorine (Upper and lower- Int. water Sol)
- Isocyanates (Upper and lower)
- Oxides of nitrogen (parenchymal injury)
- Phosgene (parenchymal injury)



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UNDERSTANDING THE LONG TERM

- Airway edema
- Increased airway resistance
- Increased secretions
- Atelectasis
- Damage to type 1 and 2 pneumocytes
- V/Q mismatch
- ARDS
- Inflammatory response



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CARBON MONOXIDE

• Incomplete combustion of organic material produces CO



METHEMOGLOBIN	
Heat induced Methemoglobinemia and inhalation of oxides of nitrogen:	
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CYANIDE	
CYANIDE	
C Y A N I D E • Cyanide (CN) • Hydrogen Cyanide	
Cyanide (CN) Airborne Immediately fatal- 270 ppm Specific gravity- 0.7 68F	
Cyanide (CN) Airborne Immediately fatal- 270 ppm Life threatening > 30 min- 110 ppm Wapor Density 0.94 Vapor Pressure at 68F- 620 mmHg	
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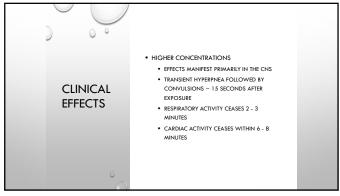
LABORATORY FINDINGS

- Blood cyanide levels
 Mild effects at 0.5 mcg/ml 1.0 mcg/ml Coma, convulsions and death at greater than 2.5 mcg/ml
- Anion gap acidosis
- Venous blood gas analysis Higher than normal venous oxygen content

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CLINICAL EFFECTS

- Lower concentrations Hyperpnea
 Feelings of anxiety apprehension
 Weakness
 Nausea
 Muscular trembling
- The "classical" cherry red skin, and smell of bitter almonds are seldom seen



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ANTIDOTES

- Lilly Kit (Nitrates)
- Cyano Kit (Hydroxycobalamin)
- DMAP (4-dimethylaminophenol)

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	CYANIDE ANTIDOTE KIT		
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)	Amyl nitrite (5%), Sodium nitrite (25-30%)		
	Oxidize iron in hemoglobin from Fe^{2+} to Fe^{3+} (methemoglobinemia) Methemoglobin binds cyanide, removing it from cells		
	Sodium thiosulfate Provides rhodonase with sulfide anion Speeds conversion of cyanide to thiocyanate		
	. 0		