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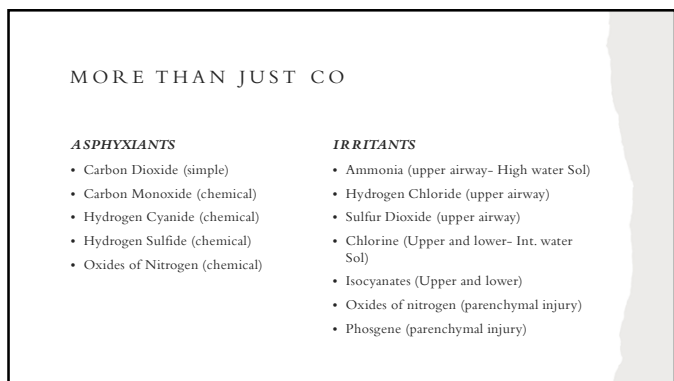
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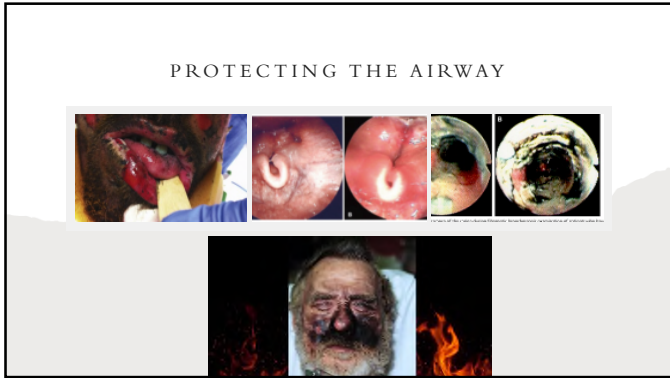
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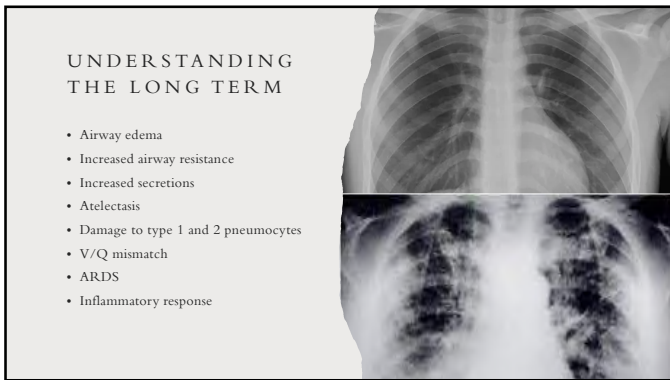
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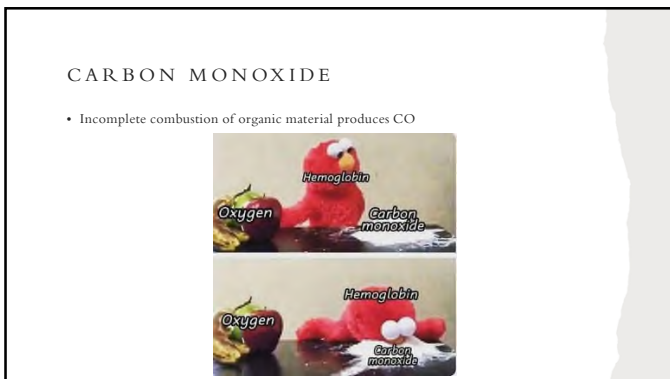
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### METHEMOGLOBIN

- Heat induced Methemoglobinemia and inhalation of oxides of nitrogen:

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### CYANIDE

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### CYANIDE

- Cyanide (CN)  
Airborne Immediately fatal- 270 ppm  
Life threatening > 30 min- 110 ppm
- Hydrogen Cyanide  
• Specific gravity- 0.7 68F  
• Vapor Density 0.94  
• Vapor Pressure at 68F- 620 mmHg  
• PEL- 10 ppm

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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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**CLINICAL EFFECTS**

- HIGHER CONCENTRATIONS
  - EFFECTS MANIFEST PRIMARILY IN THE CNS
  - TRANSIENT HYPERPNEA FOLLOWED BY CONVULSIONS ~ 15 SECONDS AFTER EXPOSURE
  - RESPIRATORY ACTIVITY CEASES 2 - 3 MINUTES
  - CARDIAC ACTIVITY CEASES WITHIN 6 - 8 MINUTES

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**ANTIDOTES**

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

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CYANIDE ANTIDOTE KIT

- 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 rhodanase with sulfide anion  
Speeds conversion of cyanide to thiocyanate

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