Purpose

To provide guidance on the use and possible situations in which CO/SpO2 monitoring may be beneficial.

Indications

- As an assessment tool for WDM FD firefighters, for use during fire rehabilitation at any structure fire where an active rehab unit is set up.
- Any subject rescued from a structure fire or any fire in which there was direct contact with a hazardous atmosphere.
- All patients suspected of CO Poisonings, either intentional or unintentional from any CO producing source such as vehicle exhaust, faulty heating and cooling units, water heaters etc.

Procedure

To monitor SpO2 (oxygen saturation of arterial hemoglobin)

1. Place the clip on a finger, removing nail polish when necessary.
2. Observe a regular, uniform waveform
3. Record SpO2 reading.

To monitor CO2 (carboxyhemoglobin saturation)

1. Place clip on a finger, removing nail polish when necessary.
2. Observe a regular, uniform SpO2 waveform.
3. Below SpO2 reading on monitor, an alternating SpMet (Methemoglobin saturation) and SpCO2 measurement will be shown.

Special Considerations

Inaccurate readings can be caused by improper sensor application; intravascular dyes such as indocyanine green or methylene blue; abnormal hemoglobin levels; low arterial perfusion; elevated
total bilirubin levels; severe anemia; externally applied coloring and texture, such as nail polish, acrylic nails, glitter, etc. and motion artifact

**SpMet**

The measurement of methemoglobin prehospitaly is typically not valuable in the prehospital setting. However, there is considerable benefit in using MET to confirm the accuracy of CO readings. There is a tendency for a SpCO2 reading to be **falsely elevated** in the presence of significant methemoglobinemia. A user should be slightly suspicious of elevated CO readings when MET levels exceed 3 percent and be downright distrustful of reported CO values when MET levels exceed 5 percent.

**Methemoglobinemia**

Methemoglobin is formed when iron on the hemoglobin molecule is converted from a ferrous to a ferric state through a chemical reaction known as oxidation. METHb behaves in much the same manner as carboxyhemoglobin: it cannot carry oxygen and causes oxygen already bound to blood cells not to release itself into the body. The result is significant oxygen deficiency (hypoxia). Unlike CO poisoning, methemoglobinemia is relatively uncommon outside of medical settings. Most cases are caused by oxidizing drugs or chemicals. (dapsone, benzocaine (topical numbing agent that can be absorbed through mucus membranes during medical procedures such as endoscopies, bronchoscopies, etc).