

Subject: Reminder regarding treatment of carbon monoxide poisoning
Date: Tuesday, March 05, 2019 3:57:00 PM

Dear Hartford Hospital Sponsored EMS Provider:

With the winter's cold weather, furnaces are working overtime and carbon monoxide exposures are more frequent.

A few recent cases of carbon monoxide poisoning are prompting us to share some reminders regarding treatment of known or suspected carbon monoxide exposure (also see EMS Protocol 2.24 Smoke Inhalation):

- **High flow oxygen (as close as possible to 100%) is indicated for any smoke inhalation or possible carbon monoxide exposure**
- **SpCO or the non-invasive monitoring for Carboxyhemoglobin (COHb) has been shown to give falsely high and falsely low results and should not be relied upon for clinical decision-making**

To explain the above points, first remember that carbon monoxide does a number of very bad things:

- Binds to hemoglobin with ~200 times the affinity of oxygen, reducing oxygen carrying and delivery capacity
- Binds to intracellular cytochromes, impairing aerobic metabolism at the cellular level
- Causes an inflammatory cascade that may result in delayed neurological complications

High flow oxygen is essential to speed removal of carbon monoxide from the body and reduce the risk of long term consequences:

- The half-life of CO is 4-5 hours breathing room air
- The half-life of CO is 50-100 minutes breathing 100% O₂
- The half-life of CO is 20-30 minutes breathing hyperbaric oxygen (@ 2 ATM)

SpCO or the non-invasive monitoring for COHb is not always accurate. For this reason, the State EMS Medical Advisory Committee intentionally removed this from the EMS scope of practice and EMS protocols. The American College of Emergency Physicians published a 2017 "Clinical Policy: Critical Issues in the Evaluation and Management of Adult Patients Presenting to the Emergency Department With Acute Carbon Monoxide Poisoning" which addresses this issue and summarizes the literature. This article is available online at: <https://www.acep.org/patient-care/clinical-policies/carbon-monoxide-poisoning/> Some case examples we've seen: EMS obtained an SpCO of 7%. The patient drove themselves to the hospital and was found to have a blood gas COHb level of 14.9%. In another case, EMS obtained an SpCO of 18%. The hospital later obtained a blood gas COHb of 21%. In both cases, actual COHb at EMS contact was likely even higher than the hospital measurements.

Thank you all for your attention and your ongoing commitment to quality prehospital patient care.

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