

Clinical Summary

Non-invasive pulse CO-oximetry screening in the emergency department identifies occult carbon monoxide toxicity

Suner S, et al. *The Journal of Emergency Medicine*. 2008; 34: 441-450.

Purpose:

The objective of this study was to ascertain whether non-invasive screening for Carbon Monoxide (CO) exposure on all patients presenting to a high-volume emergency department would identify patients with unsuspected CO poisoning.

Methods:

All adult patients presenting to the ED were screened for carboxyhemoglobin (COHb) by a handheld pulse CO-oximeter (Rad-57, Masimo Corporation, Irvine, CA). The CO-oximeter measures the levels of COHb during the pulsatile phase of blood flow, using a finger sensor. SpCO calculation relies on a multi-wavelength calibration equation to estimate the concentration of COHb. The COHb measurements (SpCO) were documented along with initial vital signs and oxygen saturation.

Data from 10,856 out of 14,438 patients were entered into the study. Those excluded were patients that left before receiving any medical care, missing charts, or charts that had incomplete data points.

Results:

During the study period, 11 patients with presenting symptoms not consistent with CO toxicity were identified through SpCO screening. Overall there were 28 cases of CO, 11 of which were unexpected.

Conclusion:

Non-invasive universal screening of patients with unsuspected CO toxicity has the potential to direct specific therapy and prevent further, potentially more severe, injury to patients and others exposed in the same environment. The frequency of confirmed occult CO poisoning in this study population was about 4 for every 10,000 visits during cold months and 1 for every 10,000 visits during warm months. Based on the lower incidence rate (1 per 10,000 visits), up to 11,000 cases of occult CO poisoning may go undetected annually.

Physio-Control Discussion Points:

In this study, handheld pulse CO-oximeters were used to screen for occult CO toxicity. More recently this technology has been integrated into medical devices such as the LIFEPAK® 15 monitor/defibrillator. SpCO can be monitored along with other parameters like SpO₂ and SpMet (Methemoglobin) through a single sensor, making SpCO spot checks and trending more accessible, cost effective and convenient to use. SpCO is a safe, easily applied tool at triage and can detect otherwise unsuspected exposure. In situations where mass screening might be needed, using SpCO could be an efficient way to quickly triage patients and improve flow and efficiency in the ED.

U.S. ONLY:

Hospital outpatient areas such as the ED may bill when testing eligible patients. Medicare will only allow a single payment per patient per day for either SpCO or SpMet.

CPT code for SpCO – 88740. CPT for SpMet – 88741.