

## **Carbon Monoxide Pulse Oximetry vs Direct Spectrophotometry for Early Detection of CO Poisoning.**

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### **Background**

Direct spectrophotometry has been recognized as a standard reference method in the treatment of victims of carbon monoxide (CO) poisoning. Recently, Masimo (USA) has developed a pulse oximeter for the detection of HbCO. Using new probes, similar to those used for traditional pulse oximetry, several different light wavelengths enable detection of different haemoglobins.

### **Methods**

We have compared forty-nine capillary blood samples taken from patients admitted to the hyperbaric center with CO poisoning. The samples were analyzed using direct spectrophotometry (HbCO) and compared with the corresponding Pulse CO-Oximeter (SpCO) readings. The Bland-Altman method was used for statistical analysis.

### **Results**

The mean HbCO concentration was 18.1±12.7% (range 0.1% to 47.4%) and the mean SpCO concentration, 17.6±11.3% (range 1.0% to 46.0%). There was a strong positive correlation between laboratory results and bedside readings ( $r^2=0.88$ ). The mean difference between readings was 0.5±4.3% (range -11.0% to +9.0%), and the distribution was uniform over the whole range of measured levels. For detection of HbCO levels higher than 20%, the sensitivity of the Pulse-CO-Oximeter was 77.8%, PPV 82.4%, specificity 90.3%, and NPV 87.5%.

### **Conclusions**

Our study confirmed the accuracy of Pulse CO-Oximetry for rapid detection of the presence and concentration of HbCO. Since this method is based on analysis of peripheral blood flow, it is not clear if it could be used in patients with low perfusion, hypothermia or burns.