

# Forensics Assessment of Carbon Monoxide Poisoning



Results in less than 10 seconds

## Avoximeter<sup>®</sup> 4000

Whole Blood CO-Oximeter

The Avoximeter 4000 CO-Oximeter has been time tested as a leader in accurate COHb detection. A major distinction that separates the Avoximeter 4000 from the others is its speed in analyzing blood samples with results in less than 10 seconds. This decrease in wait time increases productivity and clears the bottleneck allowing for faster results to help the legal system in closing cases.

Traditional methods for detecting carbon monoxide during postmortem examinations are cumbersome, time consuming and prone to interference from putrefaction and other changes in the substances analyzed. Even more recent methods, such as Mass Spectrometry, are often too expensive for routine use. Despite the difficulties, testing for the presence of carbon monoxide in blood samples is a critical task for forensic laboratories around the world.

COHb detection is an important issue of medicolegal implications and has been a common diagnostic tool in emergency medicine and forensic toxicology. The Avoximeter is particularly valuable for evaluation of either the degree of CO toxicity in arsons, suicide, motor vehicle and industrial accidents or its contributing role in deaths where COHb level is 10-50%.<sup>1</sup>

### Simple

- Low blood volume required
- Easy 2 step method:
  - Inject 50µl sample into cuvette
  - Insert cuvette into the instrument

### Efficient

- Portable for use at both the crime scene and at the lab
- Room temperature cuvette storage with extensive shelf life
- Results in less than 10 seconds
- Accurate CO-OX analysis for COHb with refrigerated sample (4°C) for at least 6 months<sup>2</sup>

**"We like the simple, quickness and ease of use for the Avoximeter 4000. We get rush cases of 2 or 3 a month and the Avox helps us get fast results."**

- Oscar Pleitez

Senior Criminalist  
Los Angeles County Department  
of Medical Examiner-Coroner



**Accriva**  
diagnostics

## Measurements and Ranges\*

Measurement	Operating Range	Accuracy	Precision	CPT Code
<b>Total Hemoglobin</b> (tHb)	4 to 25 g/dL	> 10 g/dL = ± 0.45 g/dL < 10 g/dL = ± 0.35 g/dL	> 10 g/dL = ± 0.3 g/dL < 10 g/dL = ± 0.3 g/dL	85018
<b>Oxyhemoglobin</b> (% O <sub>2</sub> Hb)	0 to 100%	± 1.6%	± 0.8%	82810
<b>Carboxyhemoglobin</b> (% COHb)	0 to 75%	± 2.0%	± 1.0%	82375
<b>Methemoglobin</b> (% MetHb)	0 to 85%	± 1.5%	± 0.7%	83050

## Interferences\*

Product	tHb	%O <sub>2</sub> Hb	%COHb	%MetHb
<b>Bilirubin</b>	None	None	< 1%	< 1%
<b>Hemolysis</b>	None	None	< 1%	< 1%
<b>Fetal Hemoglobin</b> (tHb=13.5 g/dL, HbF=100%)	< 0.45 g/dL	< 1%	6.6%	< 1%
<b>Indocyanine Green Dye</b>	< 0.45 g/dL	< 1%	< 1%	< 1%
<b>Methemoglobin</b>	< 0.2 g/dL	< 1%	None	N/A

\*Avoximeter 4000 (operator's manual) [package insert]. Edison, NJ: ITC; Revised 2007.

1 Ghanem, J. (2012). Stability of Carboxyhemoglobin in Blood Samples. *Clinical Toxicology*, 2(8), 1-4.

2 Watanabe, N. (2003). Blood Storage for Forensic Hemoglobin Using CO-Oximeter [Abstract]. PubFacts.

