

Carbon Monoxide Poisoning

Easy enough to test for, if you go looking for it. Often non-specific symptoms without a history of obvious exposure, so just as simple to overlook.

2005/6 – 415 recorded admissions for CO poisoning in the UK.

Causes

Incomplete burning of hydrocarbons, or liver metabolism of methylene chloride. Always found in cigarette smoke and car exhaust, but most stoves and heating systems can produce it if not properly vented (poorly installed or blocked).

Toxicology

Binds to haemoglobin and cardiac myoglobin; affinity ~250 times greater than oxygen; modest exposure causes a significant loss of oxygen carrying capacity. Clinical features don't correlate well with levels - ?additional mechanism involved.

Features

Most commonly reported symptoms after acute exposure are headache, dizziness, and nausea.

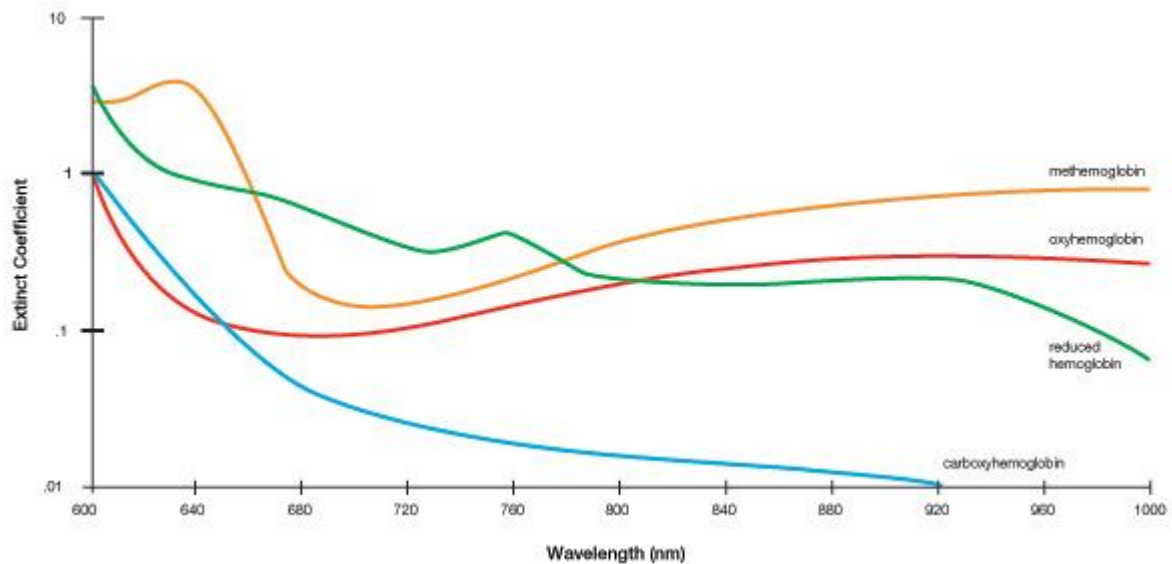
- Malaise, flulike symptoms, fatigue
- Dyspnea on exertion
- Chest pain, palpitations
- Lethargy
- Confusion
- Depression
- Impulsiveness
- Distractibility
- Hallucination, confabulation
- Agitation
- Nausea, vomiting, diarrhoea
- Abdominal pain
- Headache, drowsiness
- Dizziness, weakness, confusion
- Visual disturbance, syncope, seizure
- Faecal and urinary incontinence
- Memory and gait disturbances
- Bizarre neurologic symptoms, coma

Chronic exposure can have any of above; general cognitive decline most common.

No specific features on examination. Textbooks mention 'cherry red' colour – very rarely seen.

Diagnosis

Standard pulse oximeter (660nm and 910nm) will not differentiate COHb. Co-oximeters use more wavelengths to enable differentiation; however the accuracy in poisoning is questionable^{1,2}. Blood gas analysis appears to be better.



Consider asking about illness in other family members or residents at same address.
 Consider use of nomogram in possible accidental exposure to assess possibility of toxic levels at home.

Consider associated conditions – cyanide exposure in fires; burns; other toxins in deliberate exposure.

Treatment

Half-life 3-4 hours breathing air; 30-90 minutes on high-flow oxygen; 15-23 minutes 100% oxygen at 2.5atm pressure.

High flow oxygen until asymptomatic and level <10%

Consider referral to hyperbaric unit if COHb>40%, cardiovascular or neurological compromise; elevated levels after 4 hours high-flow oxygen. Consider referral at lower levels if pregnant.

Preston Police HQ have a chamber.

References

1. Touger M, Birnbaum A, Wang J, Chou K, Pearson D, Bijur P. (2010) Performance of the RAD-57 pulse CO-oximeter compared with standard laboratory carboxyhemoglobin measurement. *Ann Emerg Med.* 56(4):382-8
2. Zaouter C and Zavorsky GS. (2012) The measurement of carboxyhemoglobin and methemoglobin using a non-invasive pulse CO-oximeter. *Respir Physiol Neurobiol.* 182:88-92