



# Diagnosing Poisoning: Carbon Monoxide (CO)

## Patient presenting with:

Headache, nausea/vomiting, drowsiness, dizziness, dyspnoea, chest pain

**Could this be a case of CO poisoning?**

**1**

## Ask the patient

YES/NO

**C** Cohabitees/companions *Is anyone else in the property affected (including pets)?* **Y/N**

**O** Outdoors *Do your symptoms improve when out of the building? ('better outdoors')* **Y/N**

**M** Maintenance *Are your fuel-burning appliances and vents properly maintained?* **Y/N**

**A** Alarm *Do you have a carbon monoxide alarm?* **Y/N**

## If you are suspicious then ask

*Have you recently had a heating or cooking appliance installed?*

*Do you ever use your oven or gas stove for heating purposes as well as for cooking?*

*Has there been any change in ventilation in your home recently (eg fitting double glazing)?*

*Have you noticed any sooty stains around appliances or an increase in condensation?*

*Does your work involve possible exposure to smoke, fumes or motor vehicle exhaust?*

*Is your home detached, semi-detached, terraced, flat, bedsit, hostel or mobile home?*

**2**

**You are suspicious:** Could this be a case of CO poisoning?

**You are confident:** This is NOT a case of CO poisoning

## Action to take

*GP: general practice ED: emergency department*

### 1 Test for CO

*GP:* breath test for exhaled CO if device is available. (Note: this only indicates recent exposure; interpretation difficult in smokers. For interpretation of results see TOXBASE.)

*ED:* heparinised venous blood sample for COHb estimation. For interpretation of results see TOXBASE and contact the National Poisons Information Service (NPIS).

### 2 Management – commence oxygen therapy

*GP:* follow advice on TOXBASE; refer to ED if required.

*ED:* follow advice on TOXBASE. Contact NPIS for severe poisoning. See CMO/CNO letter (November 2013): [www.gov.uk/government/publications/carbon-monoxide-poisoning](http://www.gov.uk/government/publications/carbon-monoxide-poisoning).

### 3 Protect your patient and others – contact your local PHE health protection team (HPT).

The HPT will co-ordinate services for your patient and provide further guidance on CO.

Provide your patient with the phone number for gas, oil or solid fuel helplines (see notes).

### 4 **DO NOT** allow your patient to go home without a warning **NOT** to use the suspect appliances.

### 5 Follow-up

*GP:* note that symptoms may persist or develop later.

*ED:* advise the patient to see their GP for follow-up. Note this advice in discharge letter.

**3**

## If the patient does not improve

Contact the NPIS for advice.

Contact your local HPT for advice.

Reconsider diagnosis.

**4**

### Box 1 Carbon monoxide is a mimic

Carbon monoxide poisoning is notorious for simulating other more common conditions, including flu-like illnesses, migraine, food-poisoning, tension headaches and depression.

Headache is the most common symptom – *think CO!*

### Box 2 There are many sources of carbon monoxide

The source of CO may be in the home, in the car due to a leaking exhaust system, in the workplace or in tents or caravans.

Malfunctioning gas, oil, coal, coke- and wood-fuelled heating and cooking appliances are the most common sources in the home. There may be more than one source of carbon monoxide. BBQs must never be taken indoors or into tents or caravans, even when extinguished and cold to the touch.

Poisoning can occur in all income groups and types of housing. Carbon monoxide can leak into a semi-detached or terraced house/flat from neighbouring premises. It is worth asking about the sort of heating devices in use.

It is also worth asking: “Have you recently started to re-use heating appliances/boilers after the summer break/during an unexpected cold spell?”

### Box 3 Stopping further exposure is essential

Preventing further exposure is the most important thing you can do. Breath tests and blood samples may prove inconclusive some hours after exposure has ended: CO levels in the blood decline with a half-life of about 6 hours. Note that a normal concentration of carboxyhaemoglobin (COHb) does not disprove CO poisoning unless the sample has been taken during or soon after exposure ended. A heparinised venous blood sample should, however, always be taken and sent to the local clinical chemistry laboratory for analysis.

For interpretation of results and detailed advice on CO poisoning see TOXBASE and call the NPIS. If you strongly suspect CO poisoning, do not wait for the result of the analysis before taking the other steps listed in box 3. Contacting the gas (**0800 111 999**), oil (**0845 658 5080**) or solid fuel (**0845 601 4406**) safety services is essential. Contacting your local HPT is essential as the team will co-ordinate environmental health, safety, social and other services to protect your patient and others. Follow-up is important as further consequences of chronic exposure to CO may be delayed, or mild symptoms may persist, multiply or intensify. Recommend the purchase of an audible CO alarm for installation in the home.

### Box 4 Links and contact details for information on carbon monoxide

TOXBASE: [www.toxbase.org](http://www.toxbase.org)

National Poisons Information Service (NPIS): 24-hour hotline – **0844 892 0111**

NHS Direct: [www.nhsdirect.nhs.uk](http://www.nhsdirect.nhs.uk) – **0845 4647**

CMO/CNO letter (November 2013): [www.gov.uk/government/publications/carbon-monoxide-poisoning](http://www.gov.uk/government/publications/carbon-monoxide-poisoning)

Public Health England: Keep Warm Keep Well – [www.gov.uk/phe](http://www.gov.uk/phe)

Carbon monoxide – Are you at risk? – [www.gov.uk/phe](http://www.gov.uk/phe)

Information on carbon monoxide – [www.hpa.org.uk/carbonmonoxide](http://www.hpa.org.uk/carbonmonoxide)

Local HPT contacts – [www.hpa.org.uk/hpucontactdetails](http://www.hpa.org.uk/hpucontactdetails)

24-hour chemicals hotline – **0844 892 0555**



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