Carbon Monoxide (CO) Sample Collection

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Amendment History

Version	Date	Author/s	Amendment Details
2	14/09/2017	Gudrun Wells	Reviewed.

Purpose:

The purpose of this SOP is to outline the procedure for the collection of carbon monoxide (CO) samples during the course of a study.

Responsibility:

Chief Investigator(s) are responsible for delegating analysis of exhaled breath CO measurements to appropriately trained staff members (as recorded in the Delegation and Training logs).

All persons measuring exhaled breath CO must be experienced and trained in the procedure and be observed by senior staff and deemed as proficient prior to undertaking the procedure independently.

Scope:

The procedure outlines how to use equipment to obtain exhaled breath CO measurements in a safe manner to reduce the risks of inaccurate measurements being obtained.

Materials:

- An approved CO Monitor
  - Bedfont piCO Smokerlyser
  - Bedfont Micro Smokerlyser

- Alcohol free detergent wipes
- Disposable mouthpieces or disposable straws (depending on the D-piece)
- D-piece
- Latex gloves
- Biohazard disposal bag (for clinical waste).

Procedure:

Calibration

Calibration is performed every 6 months using Calibration Gas (20ppm carbon monoxide in air). Calibration should be performed as indicated in the manufacturer's instructions.

Sampling

1. Wash hands and apply gloves.
2. Turn on CO monitor and confirm that the device calibration is up-to-date.
3. Fit the disposable mouthpiece to the end of the D-piece with a gloved hand.
4. Explain the procedure (Steps 5 to 7, below) to participant and obtain verbal consent.
5. Ask the participant to hold their breath. Once they have inhaled, press the button on the device to start the countdown, and pass the device to the participant.
6. At the end of the countdown (or when no longer able to hold breath), ask the participant to blow slowly and steadily into the mouthpiece (away from you), aiming to empty their lungs. Care should be taken so as not to block the output value when holding the device (as this can result in inaccurate measurements)
7. The ppm (parts per million CO in exhaled breath) value will rise and the highest level will remain constant. Record the value shown.
8. Repeat Steps 5 to 7 to obtain a second measurement.
9. Remove the disposable mouthpiece/straw with a gloved hand from the D-piece, enclose within the glove, and place in the clinical waste disposal bag.
10. Wipe all surfaces of the monitor with a detergent wipe, including the outside of the disposable D-piece and thoroughly dry.
11. Dispose of cleaning materials in the clinical waste disposal bag.
12. Wash hands.

NOTES: The device can be muted if the participant finds the audible beeping distracting. See the instruction manual for details.

Disposal of waste and care requirements

1. Replace disposable D-piece after 1 month (or if visibly soiled) and place in a clinical waste disposal bag.

2. If the user has a known communicable infection, the disposable D-piece should be replaced immediately.
3. Label monitor, indicating when the disposable D-piece was replaced.
4. All clinical waste (disposable mouthpieces / straws and D-pieces) should be disposed of in a biohazard disposal bag.

Troubleshooting

As alcohol can cross react with the electrochemical sensor, do not use alcohol hand sanitiser or alcohol wipes on the device. Instead, use an approved non-alcohol cleansing wipe for infection control.

If an unexpected reading is obtained, testing yourself to check the sensor acts as a biological control. If your readings are normal ask the participant if they have been exposed to any sources of CO (closed garage with running vehicle, poorly ventilated fuel heater or passive smoker in a confined space) or if they have digestive issues or have recently consumed alcohol (which can give false positive results). If your readings are higher than expected remove the D-Piece and move the device back and forth through the air to flush ambient air through the sensor and repeat. If still elevated contact supplier on the best course of action.

References:

Guild. E. (2015). Protocol for safe use of Bedfont CO monitors (piCO Smokerlyser). Protocol Group, NHS Tayside, UK. Accessed on 03.08.2015 from http://www.communitypharmacy.scot.nhs.uk/documents/nhs_boards/tayside/smoking_cessation/NHS_TAYSIDE_policy_for_Safe_Use_of_Bedfont_CO_Monitors_Jan2015.pdf