



TITLE

SUSPECTED CARBON MONOXIDE EXPOSURE

SCOPE

Provincial: Emergency Departments and Urgent Care Centres

DOCUMENT #

HCS-274-01

APPROVAL AUTHORITY

Vice President, Provincial Clinical Excellence

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Not applicable

PARENT DOCUMENT TITLE, TYPE, AND NUMBER

Not applicable

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NOTE: The first appearance of terms in bold in the body of this document (except titles) are defined terms – please refer to the Definitions section.

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OBJECTIVES

- This protocol is intended for **patients** who present to an Emergency Department (ED) or Urgent Care Centre (UCC) with suspected carbon monoxide (CO) exposure.
- To assist **health care professionals** when implementing specific diagnostics, therapeutics, and interventions for patients, prior to the initial Physician or Nurse Practitioner (NP) assessment.

APPLICABILITY

Compliance with this document is required by all Alberta Health Services employees, members of the medical and midwifery staffs, students, volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary).

ELEMENTS

1. Points of Emphasis

- 1.1 Health care professionals shall immediately notify the Physician or NP of any patient who is unstable or with airway compromise due to burns.
- 1.2 This protocol may be implemented by a health care professional when:
 - a) there is a delay in Physician or NP initial assessment; and
 - b) the patient is in an appropriate location to manage ongoing assessment and reassessment.

- 1.3 Consider that CO levels may be elevated when a patient is exposed to poor ventilation of fuel combustion (e.g., heating systems, vehicle engines, generators, Jet Ski or boat motors, grills, stoves, and/or wood-burning fires).
- a) In situations where others may have been exposed and remain in the exposure setting without Emergency Medical Services (EMS) involvement, the health care professional should immediately notify 911.
- 1.4 For patients with CO exposure, oxygen saturation measurement may be unreliable as it can provide falsely elevated readings. Oxygen saturation should continue to be monitored.
- 1.5 When this protocol has been implemented for a patient who subsequently leaves prior to Physician or NP assessment, follow local process, including documentation requirements and patient follow-up of abnormal results.

2. Inclusion Criteria

- 2.1 This protocol may be implemented for a patient who presents with a suspected exposure to CO and with symptoms consistent with CO exposure, including but not limited to:
- a) headache;
- b) dizziness;
- c) nausea;
- d) malaise;
- e) vomiting;
- f) tachypnea;
- g) tachycardia;
- h) chest pain;
- i) drowsiness;
- j) vision disturbances;
- k) dyspnea;
- l) ataxia;
- m) muscle weakness;
- n) confusion; and/or
- o) seizures.

3. Exclusion Criteria

- a) Not applicable.

4. Assessment and Treatment

4.1 Oxygen therapy:

- a) Apply oxygen via a high-concentration oxygen mask with reservoir bag at 12-15 litres per minute (L/min).
 - (i) Consult Physician or NP for patients with a history of CO₂ retention, Chronic Obstructive Pulmonary Disease (COPD) or any other chronic pulmonary disease, or patients who use home oxygen.

4.2 A complete nursing assessment is required including Provocation, Quality, Radiation, Severity, and Time (PQRST) assessment of the pain and associated symptoms. Obtain a full set of vital signs including blood pressure, temperature, pulse, respiratory rate, oxygen saturation, pupils, and Glasgow Coma Scale (GCS). (Refer to the AHS *Assessment and Reassessment of Patients* Guideline [ESCN]).

4.3 If patient has an altered GCS, obtain a Point of Care Test (POCT) blood glucose measurement. If blood glucose is less than four (4) millimoles per litre (mmol/L) or greater than 18 mmol/L, notify the Physician or NP and refer to the AHS *Glycemic Management - Adult* Policy for appropriate management.

4.4 Measure carboxyhemoglobin levels using a non-invasive monitoring device, if available.

4.5 If patient is pregnant, obtain a fetal heart rate (timed for a full 60 seconds).

- a) Prolonged oxygen administration and/or obstetrical consultation may be required.

4.6 Notify the Physician or NP of abnormal assessment findings.

4.7 Complete a 12-lead ECG:

- a) If ST segment elevation or depression is present, the health care professional shall bring the ECG to the attention of the Physician or NP as soon as possible.
- b) For evaluation of the ECG, follow local procedure:
 - (i) Bring ECG to the attention of the Physician or NP; or

- (ii) Assess ECG for abnormalities that deviate from normal sinus rhythm. Compare current ECG with previous ECG, if available. Bring ECG to the attention of the Physician or NP if:
 - any new abnormalities (e.g., QRS is greater than 0.10 milliseconds [msec], bradycardia, heart block, tachycardia, prolonged QTc, flipped t-waves, atrial fibrillation) are present; or
 - there are abnormalities present and no previous ECG to compare with.
- (iii) Document on the patient’s **health record** when the ECG is given to the Physician or NP for their evaluation.

4.8 Consider consultation with the Poison and Drug Information Service (PADIS) for treatment recommendations if noxious inhalants are suspected as a by-product of burning.

4.9 Consider Physician or NP consultation with Referral, Access, Advice, Placement, Information & Destination (RAAPID) for early transfer if required.

5. Laboratory Tests

5.1 The following laboratory tests shall be drawn and sent:

- a) venous blood gas with co-oximetry; or
- b) venous carboxyhemoglobin.

5.2 Local practice guidelines may determine the laboratory tests that are included as part of this protocol.

6. Documentation

6.1 The health care professional shall document on the patient’s health record:

- a) implementation of this protocol;
- b) assessments;
- c) reassessments;
- d) interventions; and
- e) patient’s responses to interventions.

DEFINITIONS

Health care professional means an individual who is a member of a regulated health discipline, as defined by the *Health Disciplines Act* (Alberta) or the *Health Professions Act* (Alberta), and who practices within scope and role.

Health record means the collection of all records documenting individually identifying health information in relation to a single person.

Patient means an adult or child who receives or has requested health care or services from Alberta Health Services and its health care providers or individuals authorized to act on behalf of Alberta Health Services. This term is inclusive of residents, clients and outpatients.

REFERENCES

- Alberta Health Services Governance Documents:
 - *Assessment and Reassessment of Patients* Guideline (#HCS-181-01)
 - *Consent to Treatment/Procedure(s)* Policy (#PRR-01)
 - *Glycemic Management- Adult* Policy (#HCS-206)
- Non-Alberta Health Services Documents:
 - *Lippincott Advisor / Lippincott Procedures*

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