

Nitrous Oxide – Oxygen Administration Protocol

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Preamble

A patient's self-administration of a nitrous oxide-oxygen mixture can provide relief of acute pain, provided there are no contraindications to its use.

Requirements

1. Fully licensed EMT.
2. Certification in nitrous oxide-oxygen administration protocol by the Medical Director.
3. Availability of pulse oximetry.
4. Functioning exhaust fan on maximum setting, if used while on board an ambulance.

Indications

Acute pain due to any one of the following conditions:

- orthopedic trauma (e.g. soft tissue injury, suspected fracture)
- renal colic
- burns
- abdominal pain (not due to suspected bowel obstruction)

Contraindications

1. Head injury with altered level of consciousness
2. Recent ingestion of alcohol or illicit drugs
3. Major facial injuries or trauma
4. Thoracic trauma

5. Known or suspected bowel obstruction
6. Known or suspected cardiac ischemic chest pain
7. Patient developing cyanosis or respiratory distress with use of nitrous oxide – oxygen
8. Inability to comply with instructions regarding use of nitrous oxide – oxygen
9. Pulse oximeter reading indicating oxygen saturation is less than 90% prior to nitrous oxide-oxygen mixture use

Drug Dose and Frequency

1. The concentration of nitrous oxide-oxygen mixture must be 50:50. No other mixture is permitted.
2. Nitrous oxide-oxygen is self-administered by the patient with EMT assistance. The negative pressure exerted by the patient's inhalation effort triggers gas flow. A tight mask-face seal is necessary.
3. Cylinders must be positioned and secured in the upright position.
4. Cylinders must be stored at a temperature greater than 10 degree Celsius at all times.
 - cylinders must not be stored outdoors or in vehicles that are not maintained at a temperature of at least 10 degrees Celsius at all times
 - cylinders must not be stored in outside compartments of vehicles
5. Pressure readings should be checked and documented at the beginning of each shift and after each use.
6. Turn cylinder end over end three times immediately prior to each use. This will ensure proper gas mixing.
7. The ambulance exhaust fan(s) must be in operation and at maximum setting for the duration of transport.

Procedure

1. Perform patient assessment and record vital signs, level of consciousness, and oxygen saturation.
 - monitor oxygen saturation **at all times** until nitrous oxide-oxygen mixture is no longer used by the patient
 - ventilation fan may be temporarily switched off while performing patient assessment and measuring vital signs
2. Assess that patient meets criteria for this protocol.
3. Ensure there are no contraindications to use of this protocol.
4. Provide care based on other protocols related to the patient's presenting complaint.
5. Instruct the patient in the method of self-administration. The patient must self-administer the nitrous oxide-oxygen mixture without assistance.
 - EMS personnel must not assist the patient in holding the mask or delivering the nitrous oxide-oxygen mixture
6. Monitor the patient closely for evidence of efficacy or adverse effects.
7. Repeat assessment, including vital signs, level of consciousness, oxygen saturation, and effect of nitrous oxide – oxygen.
 - nitrous oxide-oxygen mixture use must be permanently discontinued if, at any point in time, the patient's oxygen saturation drops by 2% or more from baseline measurement
 - if nitrous oxide-oxygen has been discontinued due to a drop in the patient's oxygen saturation, nitrous oxide-oxygen may not be restarted, and the cylinder that was used must be removed from service
8. Clean face mask and equipment, in accordance with service procedures, after each use.

Documentation Requirements

The following information must be documented on the patient care report form:

1. Patient's presenting signs and symptoms, including vital signs, level of consciousness and oxygen saturation.
2. Indications for protocol use.

3. Time and tank regulator reading when nitrous oxide – oxygen use begins.
4. Results of treatment, including any complications.
5. Repeat assessment and vital signs, as indicated.
6. Time and tank regulator reading nitrous oxide – oxygen use ends.
7. Changes from baseline, if any, that occur during treatment or transport.
8. Signature and license number of EMT performing any transfer of function skills.

Certification Requirements

1. Attend in-depth classes and lectures on acute pain relief and the role of nitrous oxide – oxygen administration.
2. Demonstrate an understanding of the pharmacology, mechanism of action, and potential adverse effects and complication from nitrous oxide – oxygen use.
3. Identify indications and contraindications to its use.
4. Demonstrate the correct method of instructing and administering nitrous oxide – oxygen.
5. Demonstrate the correct method of maintaining the nitrous oxide – oxygen delivery system.
6. Pass a written examination.
7. Certification is by the Medical Director.

Recertification Requirements

1. Review class and recertification is done every 12 months.
2. A record will be kept to document all cases where this protocol is used.

Decertification

1. Decertification is at the discretion of the Medical Director or the Provincial Medical Director, Emergency Services, Manitoba Health.

Quality Assurance Requirements

1. Appropriate quality assurance policies must be in place. The Medical Director or designate must review all instances where this protocol is used. As a minimum, the following must be assessed:
 - i) appropriateness of implementation
 - ii) adherence to protocol
 - iii) any deviation from the protocol
 - iv) corrective measures taken, if indicated
2. Yearly statistics for protocol use compiled and forwarded to Emergency Services, Manitoba Health.