

Pulmonary Edema Nitroglycerine Protocol

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Preamble

Acute pulmonary edema is characterized by severe shortness of breath, an elevated jugular venous pressure, and crackles in both lungs. Common etiologies include ischemic heart disease, valvular heart disease, hypertension, and fluid overload.

Requirements

1. Fully licensed Technician-Paramedic.
2. Certification in pulmonary edema protocol by the Medical Director.

Indications

1. Patient with shortness of breath **and** crackles in both lungs
 - appendix 1 lists the signs suggesting pulmonary edema

Contraindications

1. Systolic blood pressure less than 100 mm Hg.
2. Known hypersensitivity to nitroglycerine.
3. Known hypersensitivity to salbutamol.
4. Use of sildenafil (Viagra[™]) in the past 24 hours, or tadalafil (Cialis[™]) in the past 72 hours. (for NTG)

Drug Doses and Frequencies

1) nitroglycerine

as nitrospray

0.4 mg sublingually

repeat q5minutes prn

maximum of 3 doses

hold if systolic blood pressure less than 100 mm Hg

OR

as nitroglycerine tablets

0.3 mg sublingually

repeat q5minutes prn

maximum of 3 doses

hold if systolic blood pressure less than 100 mm Hg

2) salbutamol (Ventolin™)

2.5mg (2.5ml premixed respiratory solution)

Procedure

1. Perform patient assessment and record vital signs, level of consciousness, and oxygen saturation.
2. Assess that patient meets criteria for this protocol.
3. Ensure there are no contraindications to use of this protocol.
4. Patient placed in semi-fowler's position, if no contraindication.
5. Administer supplemental oxygen by mask.
6. Administer nitroglycerine.
7. Administer salbutamol if severe bronchospasm.
8. Assess the patient, including vital signs, level of consciousness, oxygen saturation, and effect of treatment.
9. Initiate transport.
10. Repeat doses of medications if indicated.
11. Repeat assessment, including vital signs, level of consciousness, oxygen saturation, and effect of treatment after each drug dose.

12. If hypotension occurs, it should be managed based on the appropriate protocol. Do not administer any further medications if the patient is hypotensive.

Note: in the event of prolonged transport times, additional doses of nitroglycerine may be administered with orders via physician on-line medical control or by prior expressed written instructions from the Medical Director.

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. History of cardiorespiratory symptoms, their severity, character, and other associated symptoms.
3. Indications for protocol use.
4. Dose, formulation, route, and time for each medication dose administered, and resulting clinical effects.
5. Repeat assessment, including vital signs, level of consciousness and oxygen saturation, as indicated.
6. Changes from baseline, if any, that occur during treatment or transport.
7. Signature and license number of Technician-Paramedic performing any transfer of function skills. A second signature is required from another crew member or health care staff, witnessing discarding of unused morphine (if applicable and a treatment option).

Certification Requirements

1. Attend in-depth classes and lectures on pulmonary edema, including anatomy, physiology, and pathophysiology of the cardiorespiratory system.
2. Demonstrate an understanding of the pharmacology, mechanism of action, and potential side effects of nitroglycerine.
3. Pass a written examination.

4. 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 Medical Services, Manitoba Health & Healthy Living.

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 Medical Services, Manitoba Health & Healthy Living

Appendix 1

Possible signs and symptoms of pulmonary edema.

1. Shortness of breath
2. Crackles in lung bases
3. Apprehension
4. Hypertension (hypotension may be present)
5. Tachycardia
6. Elevated jugular venous pressure
7. Pink frothy sputum
8. Cyanosis