

Cardiac Arrest - Ventricular Fibrillation / Pulseless Ventricular Tachycardia Protocol

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Preamble

Survival from cardiorespiratory arrest for patients who present with ventricular fibrillation or pulseless ventricular tachycardia can approach 45-50%. The key intervention in improving survival is timely defibrillation. No single act has a greater impact on survival.

Requirements

1. Fully licensed Technician-Paramedic.
2. Certification in tracheal intubation or one of the double-lumen airways protocol by the Medical Director.
3. Certification in cardiac arrest - ventricular fibrillation / pulseless ventricular tachycardia protocol by the Medical Director.
4. Certification in the other "cardiac arrest" protocols as determined by the Medical Director.
5. Current certification as an advanced cardiac life support provider.

Indications

1. Patient with absent vital signs and either ventricular fibrillation or ventricular tachycardia on the cardiac monitor.

Contraindications

1. Patient under the age of 16 years.
2. Cardiac arrest possibly due to hypothermia.
3. Use of amiodarone (if an option in this protocol) is contraindicated in patients with renal failure.

Drug Doses and Frequencies

1. epinephrine

IV: 1 mg IV bolus; repeat q3-5minutes prn

ETT: 2 mg diluted in 10 ml normal saline; repeat q3-5minutes prn

2. lidocaine

IV: 1 - 1.5 mg / kg IV bolus

0.5 – 0.75 mg / kg IV dose may be repeated q5-10minutes prn

(0.5 mg / kg if the patient is greater than 75 years old, has known liver disease, or suffers from congestive heart failure)

maximum total dose by IV route: 3 mg / kg

ETT: 2 times the IV dose, diluted in 10ml normal saline

dose may be repeated q5-10minutes prn

maximum total dose by ETT route: 3 mg / kg

3. amiodarone (if an option)

IV: 300 mg IV slow push

150 mg IV dose may be repeated once in cases of refractory ventricular fibrillation or pulseless ventricular tachycardia

maximum total dose by IV route: 450 mg

Note

- amiodarone should not be added to an EMS service unless the physician(s) in the EMS service's region are familiar with and routinely use amiodarone, and the hospital(s) in the region routinely stock amiodarone
 - documentation to this effect will be required before Manitoba Health will grant a waiver to carry this agent

Procedure

1. Perform patient assessment and record vital signs, level of consciousness, and pupil size.
2. Assess that patient meets criteria for this protocol.
3. Ensure there are no contraindications to use of this protocol.
4. Initiate and continue cardiopulmonary resuscitation (CPR) At a ratio of 30 compressions to 2 ventilations.

5. Attach patient to ECG monitor. If rhythm is ventricular fibrillation or pulseless ventricular tachycardia, defibrillate at 360 J monophasic (or biphasic equivalent as per manufacturer).

(although manual defibrillation at set doses is preferred, if manual defibrillation equipment not available, may use SAED for providing shocks as indicated)

6. If at any time, a rhythm other than ventricular fibrillation or pulseless ventricular tachycardia appears, treat as per the protocol for that rhythm.
7. Continue ventilation by non-invasive means (e.g. BVM) if adequate ventilation can be maintained. If unable to ventilate by non-invasive means, intubate (using endotracheal tube or double-lumen airway) and ventilate.
8. If patient is a known dialysis patient, or if a fistula is noted, go to Cardiac Arrest Dialysis protocol.
9. Establish a large bore intravenous of normal saline, TKVO.
10. Administer initial dose epinephrine.
11. Reassess after 2 minutes (5 cycles) of CPR. Defibrillate at 360 J monophasic (or biphasic equivalent as per manufacturer) as indicated.
12. Administer initial dose lidocaine (or amiodarone, if protocol option exists).
13. Reassess after 2 minutes (5 cycles) of CPR. Defibrillate at 360 J monophasic (or biphasic equivalent as per manufacturer) as indicated.
14. Repeat epinephrine and reassess after 1 minute of CPR. Defibrillate at 360 J monophasic (or biphasic equivalent as per manufacturer) as indicated.
15. If no change in rhythm, initiate transport.
16. Epinephrine and lidocaine (or amiodarone) may be repeated based on dosing schedule, as required. CPR should be performed for 1 minute after each drug administration, defibrillate at 360 J monophasic (or biphasic equivalent as per manufacturer) as indicated.
 - if the maximum dose of lidocaine is reached but the ventricular fibrillation / pulseless ventricular tachycardia remains refractory, amiodarone (if the option exists) may be used in addition to the lidocaine
 - if amiodarone is initially used (instead of lidocaine) and the maximum dose is reached, lidocaine may be used in addition to the lidocaine if the VF / pulseless VT remains refractory

Note:

- all medications should be circulated for 30 – 60 seconds prior to defibrillation
- if a perfusing rhythm develops after defibrillation, lidocaine should not be given if the perfusing rhythm is a bradycardia with heart block or a wide complex idioventricular rhythm with a rate less than 100 per minute
- if the patient has a return of spontaneous circulation after initial management, contact physician online medical control (if available) for possible orders to initiate an infusion of lidocaine or amiodarone (if protocol option exists)

Documentation Requirements

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

1. Patient's presenting signs and symptoms, including vital signs.
2. Indications for protocol use.
3. Dose(s), time(s), route(s), and effect(s) of medications used.
4. All cardiac rhythm strips.
5. Repeat assessment and vital signs, as indicated.
6. Changes from baseline, if any, that occur during treatment or transport.
7. Signature and license number of the EMS personnel performing any transfer of function skills.

Certification Requirements

1. Attend in-depth classes and lectures on static and dynamic rhythm interpretation.
2. Demonstrate an understanding of the pharmacology, mechanism of action, and potential side effects of epinephrine, atropine, and amiodarone (if a treatment option).
3. Pass a written examination.
4. Pass practical scenarios incorporating variations of the cardiac arrest - ventricular fibrillation / pulseless ventricular tachycardia protocol.
5. Certification is by the Medical Director.

Recertification Requirements

1. Review class and recertification is done every 12 months.
2. Advanced cardiac life support provider certification must be kept current.
3. 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, 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