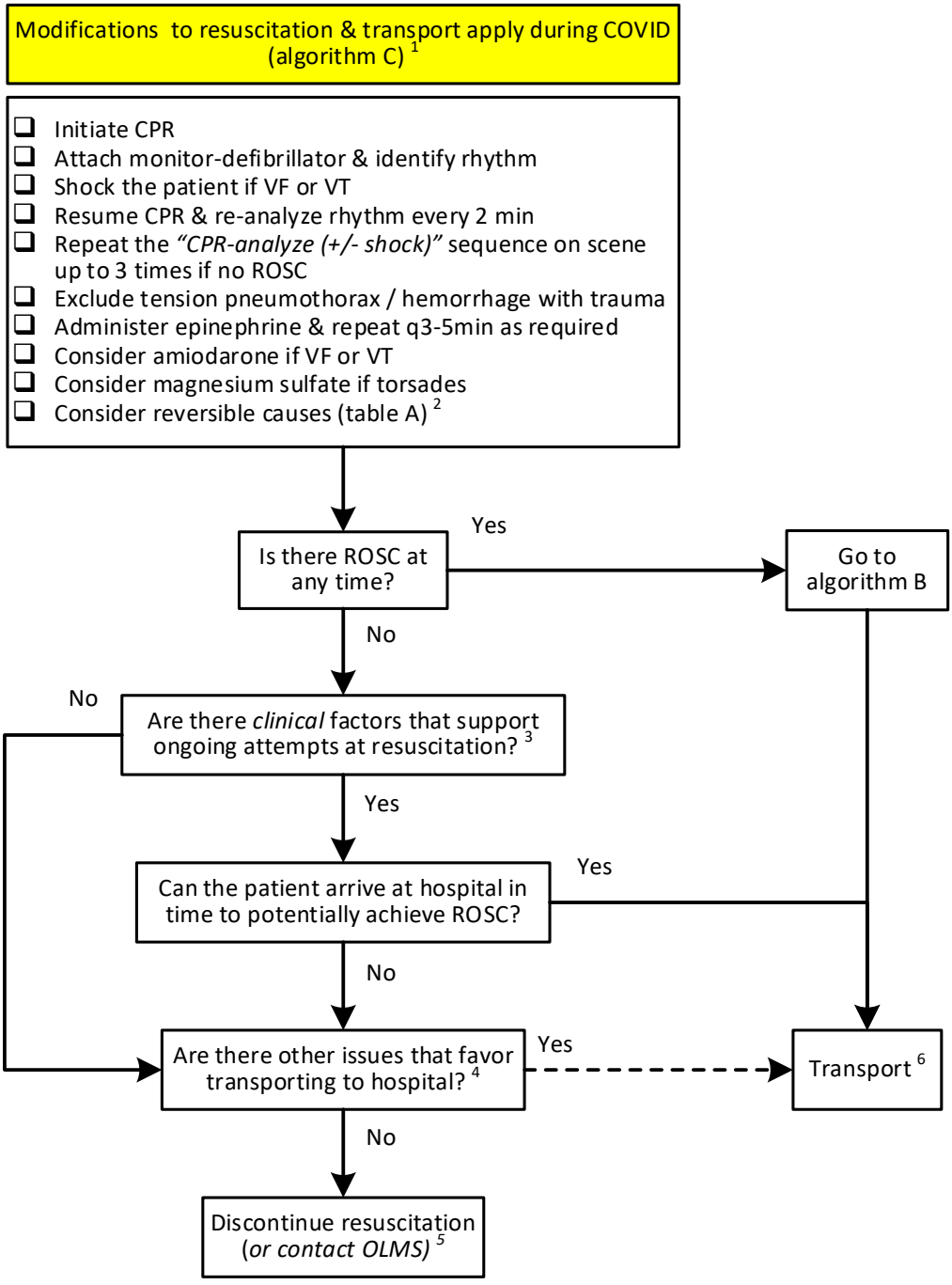
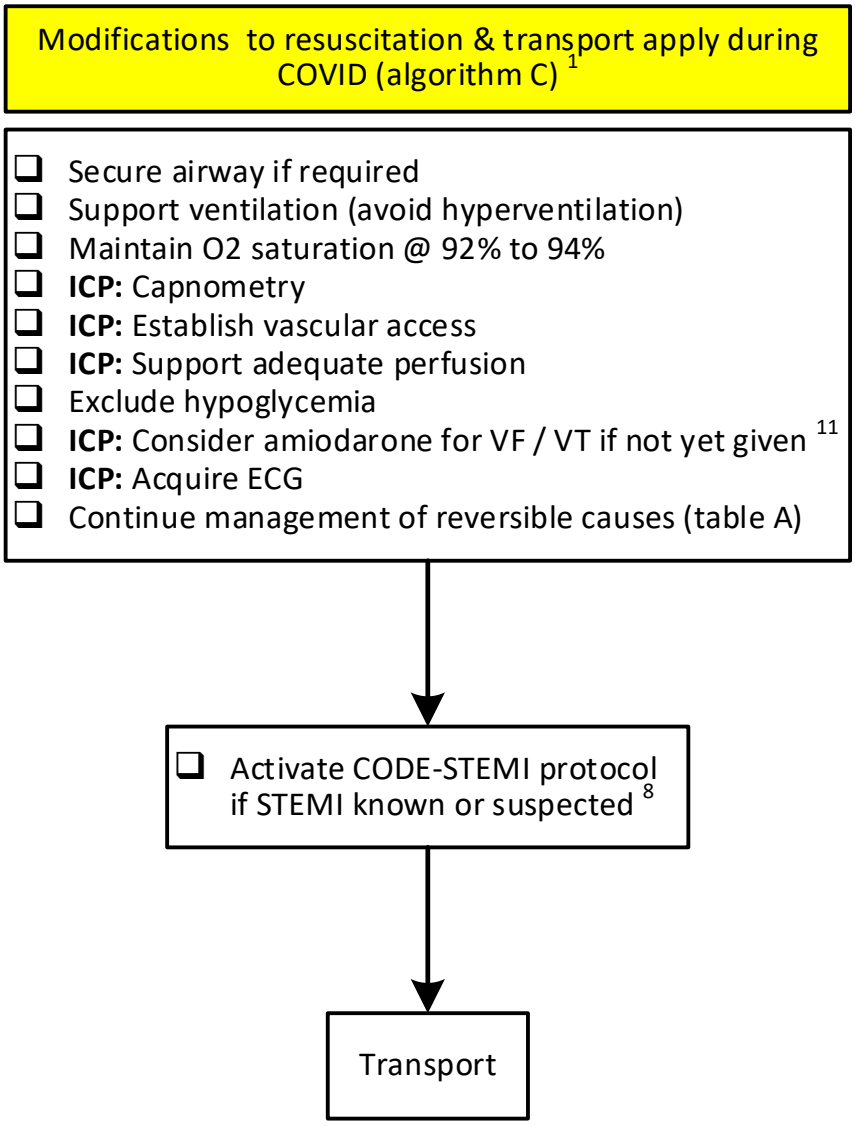
Shared health Soins communs Manitoba	C02 - ADVANCED RESUSCITATION	
	All ages	RESUSCITATION
ICP - Paramedics with the intermediate work scopes only will follow this care map.		
Version date: 2022-07-16		Effective Date: 2022-09-27 (0700 hrs)

ALGORITHM A: CARDIOPULMONARY ARREST



MEDICATION QRG *This QRG is for dosing only. Refer to the medication documents for additional information required for safe administration.*	
TEN YEARS & OLDER	**LESS THAN TEN YEARS** [7]
DEFIBRILLATION	
• Initial shock @ 120 to 200 J • Use maximum energy if uncertain • Increase the dose with each additional shock	• First shock @ 2 J/kg • Second shock @ 4 J/kg • Administer each additional shock @ 4 to 10 J/kg
EPINEPHRINE (M05.2)	
• 1 mg • Repeat every 3 to 5 minutes as required (q3-5min)	• 0.01 mg/kg (single max dose = 0.5 mg) • Repeat every 3 to 5 minutes as required (q3-5min)
AMIODARONE (M14) [11]	
• 300 mg • Repeat 150 mg once in 5 minutes	• 5 mg/kg (single max dose = 150 mg) • Repeat every 5 minutes up to 2 more times as required
MAGNESIUM SULFATE (M24)	
• 1 to 2 grams	• 25 to 50 milligrams/kg (max = 1 gram)
HYPERKALEMIA THERAPY (M10)	
• 1 gram of CALCIUM CHLORIDE • 100 mEq of SODIUM BICARBONATE • 25 gram of 50% DEXTROSE • 10 units of REGULAR INSULIN	N/A
SODIUM BICARBONATE (M18)	
• 150 mEq • Repeat once in 5 minutes if required	• 2 mEq/kg (max dose = 150 mEq) • Repeat once in 5 minutes if required

ALGORITHM B: CARE AFTER ROSC

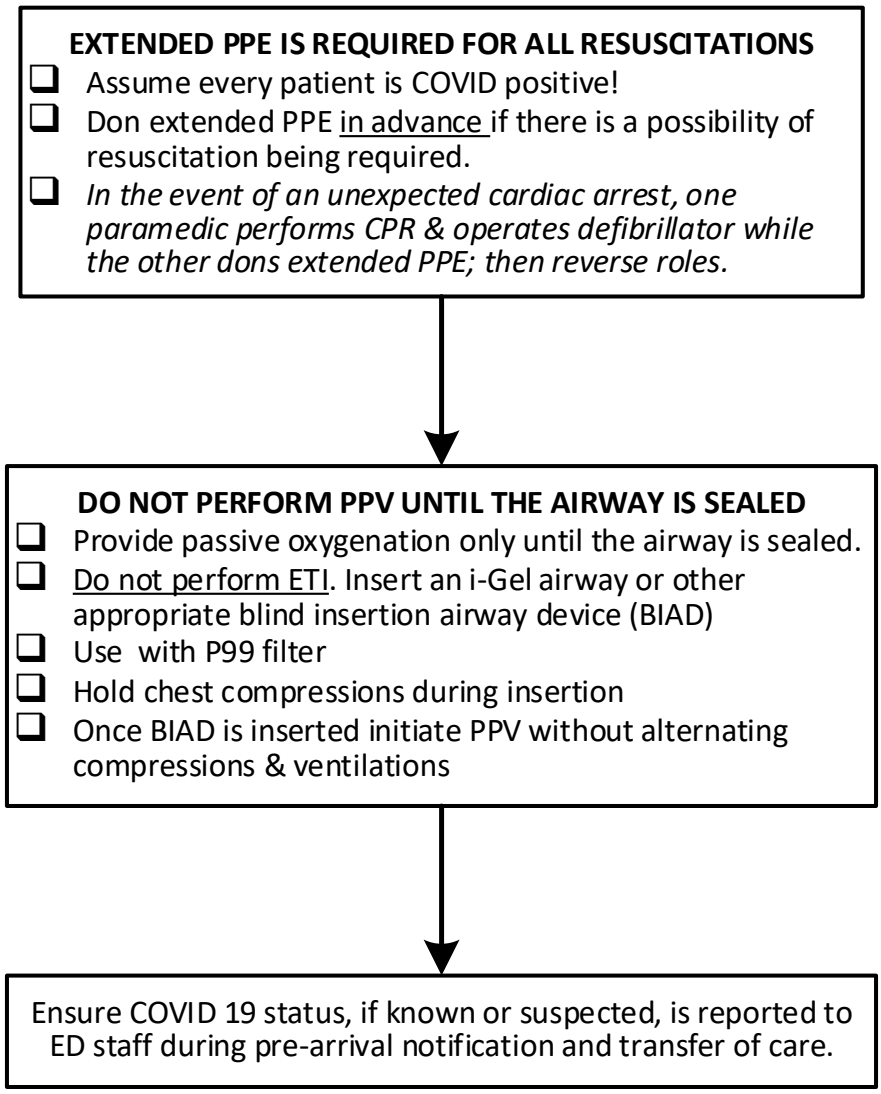


SaO_2:
> 10 yrs = 92% - 98%
< 10 = 94% - 99%

$EtCO_2$:
35 – 45 mmHg

BP (adults):
SBP > 90
MAP > 65

ALGORITHM C: MODIFICATIONS DURING COVID



INDICATIONS
• Cardiac arrest from any cause

CONTRAINDICATIONS
• Obvious signs of death [9] • Confirmation of a valid health care directive prohibiting resuscitation from cardiac arrest

NOTES

1. **During the COVID pandemic** (algorithm C):

   Airway manipulation is the main source for aerosol generation during cardiac resuscitation (chest compressions and defibrillation are not considered aerosol-generating medical procedures). Extended personal protective equipment (PPE) is required. Endotracheal intubation (ETI) is contraindicated. All paramedics will insert a blind insertion airway device (BIAD) before initiating positive pressure ventilation (PPV).

2. Some reversible causes of cardiac arrest often present initially with electrical activity (PEA) but will rapidly progress to asystole if uncorrected. Ventricular tachycardia (VT) or ventricular fibrillation (VF) due to a reversible cause such as hyperkalemia or a tricyclic antidepressant (TCA) overdose (table A) may not respond to defibrillation until the underlying cause is addressed. Prompt identification and correction of the cause while maintaining high-quality cardiopulmonary resuscitation (CPR) is the priority.

3. Factors that may support prolonged resuscitation attempts and emergency transport include the following. If in doubt, consult with the on-line medical support (OLMS) physician.
   - Younger age
   - Hypothermic arrest
   - Reversible cause with treatment available at a health care facility and short transport duration
   - Persistent electrical activity
   - Persistent $EtCO_2$ levels greater than 10 mmHg

4. In certain circumstances (e.g., pediatric arrest, distraught family) and even with little probability of survival, transporting and deferring the decision about discontinuing resuscitation to a health care provider with additional training and experience may be in the best interest of the patient's family and providers.

5. While some factors may support prolonging resuscitation efforts while transporting, emergency transport does expose paramedics and the public to some risk. Transport without ROSC should be carefully considered on a case-by-case basis. If in doubt, contact the OLMS physician for decision support.

6. If performing CPR while transporting, continue CPR unless no longer possible due to fatigue or safety concerns. Do not interrupt CPR to repeat pulse or rhythm checks. Mechanical devices such as the "Autopulse" may be used to provide chest compressions.

7. If the patient's age is unknown, use visible signs of puberty as the differentiating feature for adolescent and child dosing.

8. If transporting to St. Boniface Hospital (SBH) post arrest, proceed directly to the emergency department (ED) for stabilization, unless advised otherwise. Be prepared to reroute to the cath lab if advised by the Code-STEMI physician or on-line medical support (OLMS) physician.

9. **<u>OBVIOUS SIGNS OF DEATH</u>:** Death can be reliably concluded by finding evidence of a significant time lapse from the cessation of circulation, or the recognition of injuries incompatible with survival.
    - Evidence of significant time lapse:
        - Dependent lividity
        - Rigor mortis
        - Generalized tissue decomposition
        - Putrefaction
        - Torso freezing (chest cannot be compressed) [10]
    - Injuries incompatible with life:
        - Decapitation
        - Incineration
        - Transection of the thorax or abdomen
        - Substantial destruction of vital organs (heart, lungs, brain)
        - Separation of vital organs from the body
10. Prompt and appropriate resuscitative efforts of patients with severe hypothermia (core body temperature below 28 degrees Celsius) has been associated with survival. Torso freezing is incompatible with life, and predicts no possibility of survival.
11. When administering amiodarone to a patient with a pulse (ie. post ROSC), the dose is lower and the administration rate is slower than when administering during cardiac arrest (refer to M14)

TABLE A: POTENTIALLY REVERSIBLE CAUSES OF CARDIAC ARREST [2]

CAUSE	PREHOSPITAL PRIORITIES
Hypovolemia / hemorrhage	Fluid administration
Hypoxia	Ensure patent airway & optimize oxygenation
Acidosis	Optimize oxygenation and high-quality compressions
Hyperkalemia	Calcium chloride & sodium bicarbonate; insulin & dextrose if ROSC is achieved
Hypothermia	Prolonged efforts *may* be justified until warmed, especially with cold-water submersion [10]
Tension pneumothorax	Needle decompression
Cardiac tamponade	Possible *transient* benefit from bolus fluid administration
Overdose	Administer naloxone for opioid overdose Consider sodium bicarbonate for TCA overdose
Myocardial infarction	Expedient transport to cath lab at SBH if possible
Pulmonary embolism	Possible *transient* benefit from bolus fluid administration
Trauma	Consider uncontrolled hemorrhage or tension pneumothorax

LINKS
M05.2 - EPINEPHRINE FOR CARDIAC ARREST M10 - HYPERKALEMIA THERAPY M14 - AMIODARONE M18 - SODIUM BICARBONATE M24 - MAGNESIUM SULFATE

APPROVED BY	
	
Medical Director - Provincial EMS/PT	Associate Medical Director - Provincial EMS/PT

VERSION CHANGES (refer to X03 for change tracking)
• Compliance statement moved out of header to become policy & procedure A03 • Work scope statement added to header