



# San Juan County EMS

## Induced Hypothermia in ROSC Guideline

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### **Therapeutic Induced Hypothermia After Successful Resuscitation From Cardiac Arrest**

#### **Purpose:**

Brain temperature during the first 24 hours after resuscitation from cardiac arrest has a large effect on survival and neurological recovery. Cooling to 32-34°C for 24 hours decreases chance of death and increases chance of good neurological recovery

**Target Population(s):** The survivor of prehospital cardiac arrest with VF or pulseless VT is the most appropriate candidate for therapeutic hypothermia; other cardiac arrest rhythms, including PEA, asystole, and survivors of inpatient (clinic) cardiac arrest, can be considered for therapeutic hypothermia.

#### **Inclusion Criteria– Those patients who MAY benefit from this treatment:**

1. Cardiac arrest with return of spontaneous circulation (ROSC).
  - Cardiac arrest is defined as absence of pulses requiring chest compressions.
2. Initial arrest rhythm involving VF or pulseless VT; PEA and asystole can be considered.
3. Patients aged >18 years. Women of childbearing age (18-50 years) should not be pregnant.
4. Unresponsive after ROSC
  - Unresponsive is defined as total GCS < 10 or motor score < 4 if intubated. Does not follow verbal commands.
5. Endotracheal intubation with mechanical ventilation and **ETCO<sub>2</sub> reading > 20 mmHg**
6. SBP ≥ 90 either spontaneously or with fluid and/or infused vasopressors.
7. Known time of cardiac arrest (excludes “found down” and / or arrest of unknown duration). Importantly, no limit on duration of resuscitation for pulseless state is suggested; an arrest time, however, of less than 30 minutes is most desirable.
8. Core temperature > 34 °C at time of initiating protocol

## **Exclusion Criteria – Those patients who should NOT receive this treatment:**

1. Any other reason for coma (e.g., drug overdose, sepsis, head trauma, stroke, overt status epilepticus).
2. Pregnancy
3. Temperature of <30 C after cardiac arrest
4. Unstable blood pressure or rhythm unresponsive to therapy
5. Known, pre-existing coagulopathy or active bleeding
6. A known terminal illness preceding the arrest
7. Do not resuscitate (DNR) code status and patient not intubated as part of resuscitation efforts
8. Known primary respiratory arrest event
9. Pulmonary edema

## **PROTOCOL**

1. **Document Post-resuscitation Neurologic Status** prior to the initiation of patient cooling
2. **Assess Patient for Comfort:** Consider the administration of a narcotic analgesic. (**Call Medical Command**)
3. **Assess Patient for Agitation:** Consider the administration of a sedative agent (**Call Medical Command**)
4. **Consider Chemical Paralysis:** Once sedation has been achieved, consider the administration of a paralytic agent. The administration of a paralytic agent is not necessary in all instances of therapeutic hypothermia and is considered for the patient with excessive movement and / or shivering. (**Call Medical Command**) **Vecuronium 0.1mg/kg to max of 10 mg**
5. **Cooling Method:** Choose and apply the most clinically appropriate method(s) depending upon the patient scenario (ice packs, cooling blankets, chilled IV fluid therapy).  
  
-- To expedite the cooling process, **infuse 30cc/kg of cold 0.9% normal saline up to 2 liters** rapidly through either IV or IO route -- Place ice packs to the axilla, neck, torso, groin, and limbs.
6. Maintain MAP > 90-100mmHg: **Dopamine 10-20 mcg/kg/min for MAP 90-100**
7. **Cessation of Hypothermia:** Patients with suspected sepsis or other significant infectious event, or who develop hemodynamic or cardiac electrical instability should be withdrawn from the cooling protocol. Other clinical events can warrant cessation of therapeutic hypothermia.

# San Juan County EMS Field Guide

## 1. Select Patient

### INDUCED HYPOTHERMIA SCREENING CRITERIA

- 1. Return of Pulse
- 2. Age > 16
- 3. Not obviously pregnant
- 4. Temperature > 34° C
- 5. No purposeful pain response
- 6. Intubated with ETCO2 >20

### Preparation for Induction

- 1. Conduct NEURO assessment: 
  - a. Pupils (size, reactivity, equality)
  - b. Motor Response to Pain
- 2. Remove clothing, protect modesty
- 3. Apply cold packs
- 4. Goal ETCO2 = 40. No hyperventilation
- 5. Attempt second IV, if not in place

## 2. Induction of Paralysis

Administer **Vecuronium**

For Vecuronium (1mg/mL only) 0.1 mg/kg to max 10 ml

Weight (kg)	Dose (mg)	Volume* (cc)
30	3	3
35	3.5	3.5
40	4	4
45	4.5	4.5
50	5	5
55	5.5	5.5
60	6	6
65	6.5	6.5
70	7	7
75	7.5	7.5
80	8	8
85	8.5	8.5
90	9	9
95	9.5	9.5
100	10	10

## 3. Initiate Cooling

<b>COLD SALINE FLUID BOLUS</b>	
<b>0.9% NS at 4° Celsius</b>	
Weight (kg)	Volume Max (mL)
30	900
35	1050
40	1200
45	1350
50	1500
55	1650
60	1800
> or = 65	2000

## 4. Maintain MAP

**Target Mean Arterial Pressure (MAP): 90-100**

**Cold saline is a strong vasoconstrictor. Watch MAP closely!  
If chilled saline does not maintain MAP start Dopamine**

Monitor MAP on LP 12

Systolic	Diastolic	MAP
110	80	90
120	75-90	90-100
130	70-85	90-100
140	65-80	90-100

### Dopamine infusion guide for 400 mg in 250 mL D5W only

The values in this chart are drips per minute on a 60  
drop per minute drip set

Weight (kg)	5 mcg/kg/min	10mcg/kg/min
30	6	12
35	7	13
40	8	15
45	8	17
50	9	19
55	10	21
60	11	23
65	12	24
70	13	26
75	14	28
80	15	30
85	16	32
90	17	34
95	18	36
100	19	38
105	20	39
110	21	41