

APPENDIX: C-9

TITLE: INDUCED HYPOTHERMIA

REVISED: April 29, 2011

GENERAL COMMENTS:

BLS SPECIFIC CARE: See Adult General Cardiac Care/ACS Protocol C-3

ILS SPECIFIC CARE: See Adult General Cardiac Care/ACS Protocol C-3

ALS SPECIFIC CARE: See Adult General Cardiac Care/ACS Protocol C-3

INCLUSION CRITERIA:

ROSC	Neuro exam 5 minutes after ROSC
Age >16 (Adult)	shows NO purposeful pain response
Temp > 34 C/ F	Intubated (Intubate if indicated)
SBP > 90mmHg	

EXCLUSION CRITERIA:

DNR/POST, or other Advanced Directive	Obvious Pregnancy
Obvious Terminal Illness	Obvious Traumatic Arrest

PROCEDURE:

<u>Assess and Documents:</u>	<u>Airway Control:</u>
Pupil Response	Intubate as indicated
Neuro assessment	Ventilate to a ETCO ₂ of 35. Do not hyperventilate.

Sedation and Paralytics:

- Midazolam (Versed) – may be used to prevent shivering
 - IV, IO, IM: 0.5-5 mg, Max of 10mg
- Vecuronium (Norcuron): Use only when patient shivering is witnessed (to prevent heat production) **ADMINISTER ONLY AFTER ENDOTRACHEAL TUBE** type airway is **SECURED** and placement confirmed with **SPO₂** and **CONTINUOUS ETCO₂**
 - IV/IO: 0.1mg/kg, repeated PRN.

Induced Hypothermia

- Establish a second IV if possible.
- Expose the patient while protecting modesty.
- Cold Packs to Groin, Axilla, and Neck (if accessible).
- Saline/Water soaked Sheet applied to trunk
- Chilled Crystalloid
 - IV: 30 cc/kg fluid bolus to max of 2 liters

INDUCED HYPOTHERMIA

Target Systolic Blood Pressure : 90

Vasopressors: titrate to a blood pressure of 90 systolic if chilled saline does not maintain

Cold saline is a strong vasoconstrictor. Watch blood pressures closely!

- Dopamine infusion
 - IV: 2-20 mcg/kg/min.
- Epinephrine infusion
 - IV: 2-10 mcg/min

Ensure early notification to receiving facility for expeditious coordination of care.

PHYSICIAN PEARLS:

If vecuronium is administered, ensure versed is provided for patient sedation.

To clarify: SBP >90 needed before initiation of cooling. Patients may require vasopressors to meet this inclusion criteria.

Dopamine Infusion Matrix

Recommended Infusion Rates for Dopamine														
Mix 400 mg / 250 cc for a 1600mcg/1 cc concentration.														
Dose	Patient Weight (KG)													
	40	50	60	70	80	90	100	110	120	130	140	150	160	170
5	8	9	11	13	15	17	19	21	23	24	26	28	30	32
7	11	13	16	18	21	24	26	29	32	34	37	39	42	45
10	15	19	23	26	30	34	38	41	45	49	53	56	60	64
15	23	28	34	39	45	51	56	62	68	73	79	84	90	96
20	30	38	45	53	60	68	75	83	90	98	105	113	120	128

Epinephrine Infusion Matrix

Recommended Infusion Rate for Epinephrine		
Dose Mcg/min	1 mg/250 cc with microdrip 4 mcg/ml concentration	1 mg/100 cc buritrol 10 mcg/ml concentration
2	15 gtt/min (ml/hr)	12 gtt/min (ml/hr)
3	30 gtt/min (ml/hr)	18 gtt/min (ml/hr)
4	45 gtt/min (ml/hr)	24 gtt/min (ml/hr)
5	60 gtt/min (ml/hr)	30 gtt/min (ml/hr)
6	75 gtt/min (ml/hr)	36 gtt/min (ml/hr)
7	90 gtt/min (ml/hr)	42 gtt/min (ml/hr)
8	105 gtt/min (ml/hr)	48 gtt/min (ml/hr)
9	120 gtt/min (ml/hr)	54 gtt/min (ml/hr)
10	135 gtt/min (ml/hr)	60 gtt/min (ml/hr)

Saline Infusion & Maintenance of Mean Arterial Pressure

<input type="checkbox"/> Initiate cold saline bolus through up to (2) IV or I/O access points.		
<input type="checkbox"/> Infuse cold saline at 30ML/kg to max 2 liters		
0.9 Normal Saline at near freezing	WEIGHT (kg)	Volume Max (mL)
	30	900
	35	1050
	40	1200
	45	1350
	50	1500
	55	1650
	60	1800
> or = 65	2000	

<input type="checkbox"/> Target Mean Arterial Pressure (MAP: 90-100)		
<input type="checkbox"/> Check MAP on the LP-12 but manually monitor		
Systolic	Diastolic	Map
110	80	90
120	75-90	90-100
130	70-85	90-100
140	65-80	90-100

Glasgow Coma Scale	
Eye Opening	
Spontaneous	4
To verbal command	3
To pain	2
No response	1
Verbal response	
Oriented and converses	5
Disoriented and converses	4
Inappropriate words	3
Incomprehensible sounds	2
No response	1
Motor Response	
Obeys verbal commands	6
Localizes pain	5
Withdraws from pain (flexion)	4
Abnormal flexion in response to pain (decerebrate rigidity)	3
Extension in response to pain	2
No response	1

INDUCED HYPOTHERMIA

Pediatric Glasgow Coma Scale				
		> 1 Year		< 1 Year
<i>Eye Opening</i>	4	Spontaneous		Spontaneous
	3	To verbal command		To Shout
	2	To pain		To pain
	1	No response		No response
		> 1 Year		< 1 Year
<i>Best Motor Response</i>	6	Obeys		
	5	Localizes pain		Localizes pain
	4	Flexion-withdrawal		Flexion-withdrawal
	3	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)
	2	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)
	1	No response		No response
		> 5 Year	2-5 Year	0-23 months
<i>Best Verbal Response</i>	5	Oriented & converses	Appropriate words & phrases	Smile, coos, cries appropriately
	4	Disoriented & converses	Inappropriate words	Cries
	3	Inappropriate words	Cries and/or screams	Inappropriate crying and/or screaming