

Case Conference

Presenter : R1周光緯
 Supervisor : VS王瑞芳
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Discussion

Post-cardiac Arrest Care

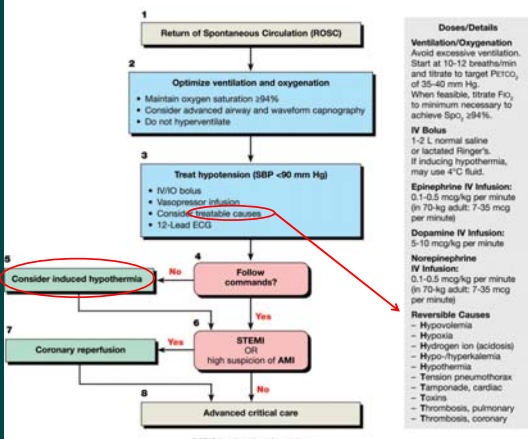
The Fifth Circle...



Initial Objects

- ◆ Optimize cardiopulmonary function and vital organ perfusion
- ◆ Transport to the “right” place
- ◆ Identify and treat the precipitating causes
- ◆ Prevent recurrent arrest

Adult Immediate Post-Cardiac Arrest Care



Induced Hypothermia

- ◆ To protect brain and other organs
- ◆ Improved neurologically intact survival to hospital discharge ?
- ◆ Better in VF or other initial rhythm ?
- ◆ May combined with PCI use

The Timing

- ◆ Animal model: < 1hr → better outcome
- ◆ The timing of hypothermia induction is not associated with neurological outcome after discharge
- ◆ Compare to normothermia, both have better outcome (2 hrs vs. 8 hrs)

Duration

- ◆ At least 12 hrs, may be >24 hrs
- ◆ No adult study now for longer duration
- ◆ Up to 72 hrs for newborns was used safely

- ◆ Cooled to 32 to 34 °C for 12 to 24 hrs (Class I)

Method of Hypothermia

- ◆ Feedback-controlled endovascular catheters
- ◆ Surface cooling devices
- ◆ Cooling blanket
- ◆ Ice bags
- ◆ Iced isotonic fluid

Monitor Core Temperature

- ◆ Esophageal thermometer
- ◆ Bladder catheter (non-trauma)
- ◆ Pulmonary artery catheter

- ◆ Axillary → inadequate
- ◆ Oral → inadequate
- ◆ Tympanic → unreliable

Complications

- ◆ Cooling :
 - ◆ Coagulopathy → control bleeding
 - ◆ Arrhythmias
 - ◆ Hyperglycemia
- ◆ Pneumonia
- ◆ Sepsis
- ◆ Prolonged hypothermia
 - decrease immune function

Hyperthermia

- ◆ Inflammatory cytokines
- ◆ Poor survival outcome if pyrexia ≥ 37.6 °C
- ◆ The late hyperthermia should be identified and treated after ROSC (class I)

Summary

- ◆ To optimize systemic perfusion after ROSC
- ◆ Reduce secondary brain injury
- ◆ Improve survival and neurological recovery

Ventilation	Hemodynamics	Cardiovascular	Neurological
<ul style="list-style-type: none"> • Capnography • Rationale: Confirm secure airway and fibrate ventilation • Endotracheal tube when possible for comatose patients • P_{EtCO_2}—35–40 mm Hg • P_{aO_2}—40–45 mm Hg • Chest X-ray • Rationale: Confirm secure airway and detect causes or complications of arrest: pneumonia, pulmonary edema 	<ul style="list-style-type: none"> • Frequent Blood Pressure Monitoring/Arterial line • Rationale: Maintain perfusion and prevent recurrent hypotension • Mean arterial pressure ≥ 65 mm Hg or systolic blood pressure ≥ 90 mm Hg • Treat Hypotension • Rationale: Maintain perfusion • Fluid bolus if tolerated • Dopamine 5–10 mcg/kg per min • Norepinephrine 0.1–0.5 mcg/kg per min • Epinephrine 0.1–0.5 mcg/kg per min 	<ul style="list-style-type: none"> • Continuous Cardiac Monitoring • Rationale: Detect recurrent arrhythmias • No prophylactic antiarrhythmics • Treat arrhythmias as required • Remove reversible causes • 12-lead ECG/Troponin • Rationale: Detect Acute Coronary Syndrome/ST-Elevation Myocardial Infarction, Assess QT Interval • Treat Acute Coronary Syndrome • Aspirin/heparin • Transfer to acute coronary 	<ul style="list-style-type: none"> • Serial Neurological Exam • Rationale: Serial examinations define coma, brain injury, and prognosis • Response to verbal commands or physical stimulation • Pupillary light and corneal reflex, spontaneous eye movement • Gag, cough, spontaneous breaths • EEG Monitoring if Comatose • Rationale: Exclude seizures • Anticonvulsants if seizing • Core Temperature Measurement if Comatose • Rationale: Minimize brain injury and improve outcome • Prevent hypothermia $> 37.2^\circ\text{C}$
<ul style="list-style-type: none"> • Pulse Oximetry/ABG • Rationale: Maintain adequate oxygenation and minimize FiO_2 • SpO_2 $\geq 94\%$ 	<ul style="list-style-type: none"> • ... • ... 	<ul style="list-style-type: none"> • ... 	<ul style="list-style-type: none"> • ...