



Post Resuscitation



Return of Spontaneous Circulation

Scene Management

- Remain on scene about 10 minutes following ROSC
- Allow for potential of re-arrest

Transport Destination Decision

Post-resuscitation patient is medically complex.

Consider facility capabilities:

- 24-hour cardiac catheterization laboratory
- Medical ICU service
- Cardiology service
- Neurology service
- Pulmonology service
- Targeted Temperature Management

Arrhythmias are common and usually self limiting after ROSC



If Arrhythmia Persists follow Rhythm Appropriate Protocol

Repeat Primary Assessment

Optimize Ventilation and Oxygenation

- Remove Impedance Threshold Device
- Respiratory Rate 10 / minute
- Maintain SpO2 92 – 98%
- **DO NOT HYPERVENTILATE**

B

- ETCO2 ideally 35 – 45 mm Hg



Airway
Protocol(s) AR 1, 2, 3, 4
as indicated

B

12 Lead ECG Procedure



IV or IO Access Protocol UP 6

P

Cardiac Monitor

Monitor Vital Signs / Reassess

Search for reversible causes

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Chest Pain and STEMI
Protocol AC 4
if indicated



Hypotension / Shock
Protocol AM 5
as indicated

A

Optimize Systolic BP and Mean Arterial BP

- Systolic BP > 90 mmHg
- Mean Arterial BP > 65 mmHg

P



Appropriate Arrhythmia
Protocol(s) AC 2, 6, 7
as indicated





Seizure Protocol UP 13
as indicated



Post Intubation BIAD Management
Protocol AR 8



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 **Notify Destination or Contact Medical Control** 



Post Resuscitation



Remain on scene for 10 minutes prior to transport to allow for possibility of re-arrest.

Immediate concerns following Return of Spontaneous Circulation

1. Optimize oxygenation and ventilation to maintain oxygen saturation at 92 % or greater.
Hyperventilation must be avoided due to induced hypotension, decreased cardiac output and oxygen injury.
2. Optimize cardiopulmonary function and vital organ perfusion.
3. Search for and treat correctable / reversible causes:
*Hypovolemia, Hypoxia, Hydrogen ion (acidosis), Hypo / Hyperkalemia, Hypothermia, Hypoglycemia
Tension Pneumothorax, Tamponade; cardiac, Toxins / Ingestions, Thrombosis; pulmonary, Thrombosis; coronary*
4. Identify and treat STEMI
5. Transport to facility capable of caring for post arrest patients.

Anti-arrhythmic medications:

Continue anti-arrhythmic given during cardiac arrest even if arrhythmia is not present as maintenance therapy.

Sedation/ Paralysis/ Shivering with BIAD / ETT in place:

- In the post-resuscitative phase the patient may require sedation and paralysis.
- The primary focus is to sedate the patient adequately with and opioid or ketamine which addresses pain.
- Pain is the primary cause of agitation in the intubated patient. Midazolam may also be used ONLY after two to three doses of opioid or ketamine.
- The patient should not be paralyzed unless they are sedated first as this causes tremendous psychological and physical stress.

Airway:

- Following ROSC the EMT-Paramedic may elect to exchange a BIAD to ETT.

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Continue to search for potential cause of cardiac arrest during post-resuscitation care.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided. Titrate FiO₂ to maintain SpO₂ of 92 - 98%.**
- **Pain/sedation:**
Patients requiring advanced airways and ventilation commonly experience pain and anxiety.
Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.
Ventilated patients cannot communicate pain / anxiety and providers are poor at recognizing pain / anxiety.
Vital signs such as tachycardia and / or hypertension can provide clues to inadequate sedation, however they both are not always reliable indicators of patient's lack of adequate sedation.
Pain must be addressed first, before anxiety. Opioids are typically the first line agents before benzodiazepines. Ketamine is also a reasonable first choice agent.
- **Ventilator / Ventilation strategies:**
Tailored to individual patient presentations. Medical Control can indicate different strategies above.
In general ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 mL/kg and peak pressures should be < 30 cmH₂O.
Continuous pulse oximetry and capnography should be maintained during transport for monitoring.
Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk.
- **EtCO₂ Monitoring:**
Initial End tidal CO₂ may be elevated immediately post-resuscitation, but will usually normalize.
Goal is 35 – 45 mmHg but avoid hyperventilation to achieve.
- Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 65 – 80 mmHg.
- **STEMI (ST-Elevation Myocardial Infarction)**
Consider placing 2 IV sites in the left arm: Many PCI centers use the right radial artery for intervention.
Consider placing defibrillator pads on patient as a precaution.
Document and time-stamp facility STEMI notification and make notification as soon as possible.
Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).
- Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiology / cardiac catheterization, intensive care service, and neurology services.
- **Targeted Temperature Management (optional):**
Maintain core temperature between 32 - 36°C.
Infusion of cold saline is NOT recommended in the prehospital setting.
No evidence suggests improved survival with prehospital cooling.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with Medical Control.