


Section: ALS Protocols
Subject: RETURN OF SPONTANEOUS CIRCULATION (ROSC) IN ADULTS
Section #: 345.20
Issue Date: April 17, 2015
Revision Date: December 1, 2017
Approved By: 

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1. **Clinical intent:** There is increasing recognition that systematic post-cardiac arrest care after return of spontaneous circulation (ROSC) can improve the likelihood of patient survival with good quality of life. This is based in part on the publication of results of randomized controlled clinical trials as well as a description of the post-cardiac arrest syndrome. Post-cardiac arrest care has significant potential to reduce early mortality caused by hemodynamic instability and later morbidity and mortality from multi-organ failure and brain injury.¹
2. General care:
 - a. Confirm return of spontaneous circulation (ROSC).
 - b. Elevate the head of the bed 30 degrees.
 - c. Ensure an adequate airway and support breathing immediately after ROSC
 - i. It may be necessary to replace the supraglottic airway used for initial resuscitation with an endotracheal tube, although the timing may vary depending on how well the supraglottic airway is functioning and the relative security of the location where the ROSC occurred..
 - ii. For patients with assisted ventilations, provide 10 to 12 breaths per minute with a target ETCO₂ of 35-40 mmHg.
 - d. Perform a detailed neurological exam and document it in the ePCR.
 - e. Perform a 12-Lead EKG and initiate STEMI alert if criteria exists per the **HCFR CARDIAC STEMI (ST ELEVATION MI)** protocol.
 - f. **Oxygen**
 - i. Titrate the delivery of **oxygen** to maintain SaO₂ between 94% and 96%^{2 3}
3. Targeted care:
 - a. Hemodynamic instability is common after cardiac arrest and should be treated aggressively. For hypotension (systolic blood pressure (SBP) <120 mmHg):
 - i. Administer **normal saline** 200 mL IV bolus once
 - ii. If no response, start **dopamine** at 5 mcg/kg/min IV/IO and increase by 5 mcg/kg/min q5 min to target a SBP >120 mmHg
 - b. Treat arrhythmia as directed by appropriate HCFR arrhythmia protocol.
 - c. If cardiac arrest re-occurs, refer to the appropriate HCFR protocol based on the presenting rhythm
 - d. If seizures occur, use **HCFR SEIZURES** protocol.
4. Transport:
 - a. All patients with ROSC are to be transported to the nearest PCI (Percutaneous Coronary Intervention) capable hospital

¹ Peberdy MA, Callaway CW, Neumar RW, et al. 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 9: Post-Cardiac Arrest Care. Circulation. 2010; 122: S768-S786

² Liu Y, Rosenthal RE, Haywood Y, Miljkovic-Lolic M, Vanderhoek JY, Fiskum G. Normoxic ventilation after cardiac arrest reduces oxidation of brain lipids and improves neurological outcome. Stroke. 1998;29:1679-1686.

³ Kuisma M, Boyd J, Voipio V, Alaspaa A, Roine RO, Rosenberg P. Comparison of 30 and the 100% inspired oxygen concentrations during early post-resuscitation period: a randomised controlled pilot study. Resuscitation. 2006;69:199-206.

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- b. The Rescue Division maintains a list of Hospital Capabilities and it is updated any time there are changes.
5. QA Points:
- a. Ensure that the airway is secured and maintained.
 - b. Many patients with ROSC suffer from pulmonary edema secondary to a stunned myocardium. If the patient requires PEEP to keep their oxygen saturation at an acceptable level, consider changing over to a cuffed endotracheal tube. If you choose to do so, perform the procedure in a relatively secure location.
 - c. Hyperventilation or "over-bagging" the patient is common after cardiac arrest and should be avoided because of potential adverse hemodynamic effects
 - d. Although 100% oxygen may have been used during initial resuscitation, providers should titrate inspired oxygen to the lowest level required to achieve an arterial oxygen saturation of $\geq 94\%$, so as to avoid potential oxygen toxicity.