Virginia
OFFICE OF EMERGENCY MEDICAL SERVICES
Virginia Department of Health

Position Paper: Post Return of Spontaneous Circulation Care

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Post Return of Spontaneous Circulation Care

Definitions:

With the recent scientific advances in resuscitation, most of which are performed in the receiving hospital, efforts should be made to incorporate these advances into our EMS systems. The following position paper Post Return of Spontaneous Circulation Care has been approved to provide guidance in resuscitation.

Background:

Virginia EMS providers responded to an average of over 7,700 cardiac arrests annually in 2004 to 2008[1]. Nationally, 250,000 persons suffer out of hospital sudden cardiac arrest and the incidence is approximately 55 per 100,000 population[2]. Over 90% of these persons will not be resuscitated. Some areas of the country have experienced better outcomes than others. The differences in outcomes may not be related to variations in patient care rather than patient demographics[3]. The past few decades has seen concentration of efforts on CPR, early defibrillation/public access defibrillation, and improvements in ACLS.

With the recent scientific advances in resuscitation, most of which are performed in the receiving hospital, efforts should be made to incorporate these advances into our EMS systems. There are multiple interventions which contribute to improved outcomes. These interventions should be available 24 hours per day, 7 days a week. This may represent a significant financial and clinical commitment of all stakeholders, especially hospitals.

Hospital initiated induced mild hypothermia (33° C to 34°C) has been shown to be have improved survival and improved neurological outcomes for comatose patients with return of spontaneous circulation (ROSC)[4]. Some studies have demonstrated the feasibility of prehospital agencies to begin induction of mild hypothermia[5]. Animal models suggest that early induction correlates with improved outcomes[6]. The National Association of EMS Physicians advocates the use of prehospital induced mild hypothermia post arrest but acknowledges limitations in its application[7]. Additional research is needed to determine the efficacy of prehospital initiated mild hypothermia in the differing presenting rhythms of cardiac arrest patients. In another animal study, intra-arrest induced hypothermia demonstrated added benefit[8]. Many methods to initiate induced mild hypothermia have been examined [9] [10] [11] [12]. Prehospital agencies should evaluate the method for initiating induced mild hypothermia that suits the logistical needs of the agency.

In patients with ROSC, 97% may have coronary artery disease and up to 50% have an acute coronary occlusion[13]. The benefits of primary PCI in post ROSC patients have been demonstrated. An ECG should be obtained on patients with ROSC as soon as possible, preferably by EMS at the scene. Patients with evidence of ST elevation myocardial infarction (STEMI) should be transported to facilities which can offer

percutaneous coronary intervention (PCI) as soon as possible. In some patients who survive an out of hospital cardiac arrest, an implantable cardioverter-defibrillator (ICD) may prevent another episode[14]. There is wide variation in the rates of ICD placement. Patients who survive to hospital discharge should be evaluated for ICD placement before discharge.

Seven to eight percent of unresponsive patients with ROSC have clinical seizures[15]. If the patients are sedated and paralyzed to reduce shivering from hypothermia, there may be little clinical indications of the seizure. The metabolic effects of seizures may be detrimental to patient outcomes.

Facilities which offer comprehensive post ROSC care should evaluate their prognostic criteria for predicting outcome. Recent literature has demonstrated that neurological assessment of patients 72 hours post ROSC is unreliable[16]. The literature should be periodically reviewed to update criteria.

Regionalization of care is already in existence for trauma, stroke, and a variety of other disease entities. EMS systems should coordinate with area hospitals, preferably through regional council systems, to develop a seamless plan of care for unresponsive ROSC patients. Regional systems should include academic and/or community hospitals with multidisciplinary teams, including emergency medicine, cardiology, neurology, and critical care[17]. The system should be developed to triage the low volume of unresponsive ROSC patients to a limited number of institutions in order to allow facilities to gain (and maintain) the proficiency needed in post ROSC care[18]. Hospitals which do not offer comprehensive post ROSC care should develop transfer plans and agreements with centers which can provide the services[19]. Stakeholders should share their data to further improve post ROSC care and outcomes in their regions.

The Virginia Office of EMS Medical Direction Committee endorses the following:

1. Development of a regional system which can offer a comprehensive program to patients with ROSC from out of hospital cardiac arrest.
2. Ideally, the system will triage patients in a manner to allow facilities to gain and maintain proficiency in caring for these complex critical patients.
3. Stakeholders should collaborate with their data as a system to improve regional out of hospital cardiac arrest outcomes.

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