

## Resuscitation in Puerto Rico: Where are the Survivors?

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Resuscitation from death is not an every day event; however, it is no longer a rarity. Cardiopulmonary resuscitation (CPR) has, therefore, become a common tool in our management of these critically ill patients. Despite an improved understanding and management of cardiac arrest, and the widespread application of do-not resuscitate (DNR) orders in an attempt to prevent the inappropriate use of CPR, the success rate following in-hospital cardiac arrest has remained unchanged over the last three decades, with return of spontaneous circulation (ROSC) in about 30% with approximately 15% of patients being discharged neurologically intact [1-5].

In this issue of *Critical Care and Shock*, Santos-Llanos and co-workers, in a retrospective one-year record review of CPR requiring advanced cardiac life support (ACLS) at the Veterans Administration Caribbean Health Care System, report a dismal 7.38% survival to hospital discharge [6]. These investigators documented 128 arrests in Puerto Rico during the study period. Most of their cohort patients were male, which can be explained by the large number of male veterans that are cared for in this particular health care system.

It is interesting to note that in this study many of the patients were categorized as older adults. The authors believe that the lower and dismal survival rate of their sample was a consequence of being older and having comorbid conditions. This is in contrast to other studies

that have shown that the elderly have similar chances of success at CPR as do younger patients [7]. We have previously suggested that age alone should not be considered as the only determinant in DNR orders and when discussing survival rates among critically ill elderly patients [8].

The basic question remains why such a poor outcome in these patients? Is this based on regional variability? Caribbean resuscitation rates data is lacking and this article provides first-hand insight into the Puerto Rico resuscitation rates at the Veterans Administration Health Care System. This system utilizes standard ACLS and CPR techniques are utilized following international guidelines.

We could hypothesize that comorbidities among the veterans in this cohort, other than age alone, could be the primary reason for the small percentage of patients that were discharged alive. Many of these patients had a primary respiratory arrest as the precipitating event requiring CPR, in part indicating the high prevalence of chronic pulmonary illness among these patients. Moreover, it is well recognized that patients in the Veterans Affairs Health Care System tend to have other significant comorbidities and high mortality rates from cardiovascular conditions [9].

In the future, studies of CPR outcome at the Veterans Affairs Health Care System both in the mainland as well as the American territories may provide some answers as to the dismal survival rates found on this study. We applaud Santos-Llanos and collaborators for presenting challenging and very intriguing data.

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## References

1. Bedell SE, Delbanco TL, Cook EF, Epstein FH (1983) Survival after cardiopulmonary resuscitation in the hospital. *N Engl J Med* 309:569-576
2. Roberts D, Landolfo K, Light RB, Dobson K (1990) Early predictors of mortality for hospitalized patients suffering cardiopulmonary arrest. *Chest* 97:413-419
3. Rozenbaum EA, Shenkman L (1988) Predicting outcome of inhospital cardiopulmonary resuscitation. *Crit Care Med* 16:583-586
4. Schneider AP 2nd, Nelson DJ, Brown DD (1993) In-hospital cardiopulmonary resuscitation: a 30-year review. *J Am Board Fam Pract* 6:91-101
5. McGrath RB (1987) In-house cardiopulmonary resuscitation-after a quarter of a century. *Ann Emerg Med* 16:1365-368
6. Santos-Llanos G, Galera-Santiago A, Torres-Palacios A, Rodriguez-Cintron W (2008) Predictors of Survival in Resuscitation. *Crit Care & Shock* 11:54-60
7. Varon J, Fromm RE Jr (1996) In-hospital resuscitation among the elderly: substantial survival to hospital discharge. *Am J Emerg Med* 14:130-132
8. Varon J, Marik P (1997) Cardiac arrest in the elderly: CPR or no CPR, that is the question! *Chest* 112:1147-1148
9. Maynard C, Lowy E, Rumsfeld J, Sales AE, Sun H, Kopjar B, Fleming B, Jesse RL, Rusch R, Fihn SD (2006) The prevalence and outcomes of in-hospital acute myocardial infarction in the Department of Veterans Affairs Health System. *Arch Intern Med* 166:1410-1416