PRESS RELEASE

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Data Presented at the AHA Shows Use of an Impedance Threshold Device with High Quality CPR Increased Survival to Hospital Discharge from Out of Hospital Cardiac Arrest

[November 17, 2014, Minneapolis, MN] An analysis of data from the Resuscitation Outcomes Consortium (ROC) Trial presented at the American Heart Association (AHA) Scientific Sessions in Chicago showed that the quality of CPR confounded the results of the trial. The ROC PRIMED Trial, published in the New England Journal of Medicine in 2011, compared conventional manual CPR with an active or sham impedance threshold device (ITD) and initially reported no difference in outcomes. A new analysis of the data from the trial presented by Dr. Demetris Yannopoulos, MD, of the University of Minnesota, showed that there was an interaction between CPR quality and the use of the active ITD, confounding the results of the trial. It also showed that use of an ITD combined with high quality CPR increased survival to hospital discharge from out of hospital cardiac arrest for patients in the study. Lead author Demetris Yannopoulos presented the abstract, titled The Effect of CPR Quality: A Potential Confounder of CPR Clinical Trials, in a podium presentation at the AHA’s Resuscitation Science Symposium on November 15th. The authors expect full results to be published in 2015.

The authors analyzed data from the ROC Trial to see whether the quality of CPR had an interaction with the intervention of an ITD, therefore confounding the results of the study. Their analysis showed that when high quality CPR was performed, neurologically-intact survival in the active ITD group was actually 75% higher than when a sham ITD was used. High quality CPR was defined as a compression rate of 80-120/min, a depth of 4-6 cm, and a compression fraction of >50%, all consistent with AHA guidelines at the time of the study.

The abstract concluded:
Overall, a total of 848 and 827 patients in the active and sham ITD groups had documented “quality CPR” performed. Including all presenting rhythms, use of an active ITD increased survival to hospital discharge with a modified Rankin Scale Score (MRS) ≤3 compared to sham (61/848 [7.2%] versus 34/827 [4.1%], respectively; p=0.006, OR: 1.8, 95% CI: 1.17, 2.78). There was significant interaction between the active and sham ITD and compression rate, depth and fraction.

Lead author, Dr. Demetris Yannopoulos, an internationally renowned researcher in the field of resuscitation and Robert K Eddy Endowed Chair for Cardiovascular Resuscitation at the University of Minnesota, commented, “The ROC PRIMED Trial was a landmark study that is helping us better understand CPR and the ITD. Recently published data showed a strong correlation between compression rates and survival when an active ITD is used. This analysis further explores the relationship between high quality CPR and the ITD, and our findings are consistent with other published data showing that use of an ITD with high quality CPR improves survival from out of hospital cardiac arrest.”

The impedance threshold device (ITD) was developed by a University of Minnesota researcher and is used widely by hospitals and EMS systems to improve perfusion during CPR. An ITD regulates pressure in the chest to reduce intracranial pressure and maximize the blood drawn into and pushed out of the heart with each chest compression if the patient is receiving cardiopulmonary resuscitation (CPR). Use of an ITD in cardiac arrest has been supported by multiple clinical trials and shown to improve survival. The ROC PRIMED Trial was the first large randomized trial of the device to show neutral results. These new
data further validate that Intrathoracic Pressure Regulation (IPR) Therapy provided by the ITD improves hemodynamics and survival when used with high quality CPR.3-10

The University of Minnesota is a leading research center in the field of resuscitation. Researchers like Dr. Yannopoulos are finding unique ways to increase neurologically intact survival from cardiac arrest, which kills thousands of people every day in the United States.

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