

**Circulation 2006;114(18):II-1209****[108] Use of an Impedance Threshold Device Improves Survival in a Suburban EMS System*****Levon Vartanian, Gregory Wolf, Allen Sims, Kevin Traynor, Cypress Creek EMS, Spring, TX***

**Introduction:** The 2005 AHA guidelines recently recommended (Class IIa) the use of an impedance threshold device (ITD) to increase circulation and return of spontaneous circulation (ROSC) rates in patients in cardiac arrest.

**Hypothesis:** We assessed the hypothesis that adding an ITD to standard BLS and ALS resuscitation efforts would improve short-term survival in patients with out-of-hospital cardiac arrest from all causes when compared to historical controls.

**Methods:** Cypress Creek EMS (population 400K) covers a suburban area North of Houston (TX) in Harris County. From 8/05-4/06, 104 patients in cardiac arrest were prospectively treated with an ITD (ResQPOD®) and survival results were compared to historical controls (n=143) from 8/04-7/05 when an ITD was not in use. The primary endpoint was ROSC. A Chi square test was used for statistical analysis. Age, gender and EMS response time (~ 8 min) were evenly matched between groups. The ITD was used on all patients in cardiac arrest (all etiologies) who were >1 year of age. It was applied ~ 10 minutes after the 911 call, typically first on a facemask and then moved to an endotracheal tube if the patient was intubated.

**Results:** ROSC rates were 45% in the historical control group vs. 59% in ITD patients (P=0.03). Neurologically intact hospital discharge rates improved from ~ 10% (control) to 17% in the ITD group (p=ns). The benefit was observed regardless of presenting rhythm, including 4 ITD-treated patients with intact neurological status at discharge who presented with asystole vs. none in the control group. There were no adverse events associated with ITD use.

**Conclusion:** In conclusion, following ITD implementation, ROSC rates increased by 29% and neurologically intact discharge rates improved by >50%. Use of the ITD was easily and rapidly implemented, resulting in a significant improvement in survival - the highest overall resuscitation rates observed in the 30-year history of the Cypress Creek EMS system.