POSTER 021.
Comparison of Two-Person CPR with Bag-Valve-Mask Device to One-Person CPR Using the Kendall Cardio Vent® Device in an Intubated CPR Mannequin.

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Objectives: Cardiopulmonary resuscitation in the prehospital setting requires at least two rescuers, often necessitating dispatch of additional rescue units. The KCV,® which permits simultaneous compression and ventilation by one rescuer, was compared with two-person CPR with BVM.
Methods: A single-blinded, double crossover study with six CPR instructors each performing one-person CPR with KCV® and two-person CPR with BVM on an intubated recording CPR mannequin (Recording Resusci-Anne®). Tidal volume, obtained by spirometry, and compression depth were recorded continuously during each 12-minute CPR session. Mean tidal volume (MTV), minute volume (MV), compression rate (CR), ventilation rate (VR) and errors in compression depth (ECD) were compared for CPR sessions performed by one person with KCV® and two persons with BVM. Student's *t*-test and regression analysis were used in statistical calculations (with Statview II® software).
Results: A total of 1,894 ventilations and 10,532 compressions were performed in three separate 12-minute sessions. Mean tidal volume and CR for KCV® were significantly different than BVM: 1242.3 ml. versus 1,065.0 ml. (p = 0.0018) and 63.2/min. versus 81.3/min. (p = 0.0076) respectively. However, both KCV® MV and VR were not statistically different than BVM: 14,760.0 ml. versus 16,058.7 ml. (p = 0.5649) and 11.9/min. versus 14.9/min. (p = 0.1226) respectively. Errors in compression depth rate of 9.78% was observed with KCV® compared to 8.49% with two-person CPR (p = 0.1815). ECD rate increased as a function of time equally for both KCV® (1.8 %/min.) and two-person CPR (1.4 %/min.) (r = 0.952; p = 0.0001).
Conclusions: One-person CPR with KCV® was equivalent to two-person CPR with BVM in all measured parameters except for the CR. Use of KCV® will effect better manpower allocation on the prehospital patient requiring CPR. Further work is needed to determine whether the lower CR associated with KCV® is clinically significant.

POSTER 032.
Population Density and Outcome from Automated External Defibrillation by Basic EMTs (EMT-AED) in Rural BLS Ambulance Services

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Purpose: To determine if population density is an independent predictor of survival from out-of-hospital cardiac arrest treated by EMT-AED in rural BLS ambulance services.
Methods: *Design:* observational; *Setting:* rural southeastern state; *Participants:* Thirty-three rural BLS ambulance services covering 21 counties that instituted EMT-AED practice during the years 1992 through 1994; *Data analysis:* Student's *t*-test for continuous variables, Mantel-Haenszel chi-square statistic or Fisher's exact test for dichotomous variables.
Results: A total of 254 patients with out-of-hospital cardiac arrest, 86 (34%) patients defibrillated, 31 (12%) resuscitated to hospital admission, and 12 (4.7%) patients survived to hospital discharge. Predictors for survival to hospital discharge were EMS response time (from call receipt to ambulance arrival) less than 8 minutes, defibrillation, and population density >200 per square mile for the county (p <0.001).

Pop Density	Total Patients	Call-Arrival Time (min)*	# Defib	# VF	# Admit	# Disch*
<100/sqmi	129	9.4 ±6.0	37	31	11	1
>200/sqmi	125	5.7 ±3.3	49	35	20	11
	* p <0.001					

Population density remained a predictor independent of EMS response time, initial rhythm, defibrillation, availability of 9-1-1, witnessed arrest, or bystander CPR.
Conclusions: Rural areas with population densities less than 100 per square miles appear to have little benefit from EMT-AED treatment for out-of-hospital cardiac arrest.

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