Statewide Implementation of a Standardized Prearrival Telephone CPR Program Is Associated with Increased Bystander CPR and Survival from Out-of-Hospital Cardiac Arrest

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Background: Bystander CPR (BCPR) increases survival from OHCA yet is provided in a minority of cases. The AHA has promulgated guidelines on the provision of pre-arrival Telephone CPR (TCPR) instructions and measurement to increase the proportion of BCPR; however, the impact of those guidelines on survival is unknown.

Objective: To describe the impact of a comprehensive bundle of 9-1-1 TCPR protocol, training, data collection, and feedback on BCPR and survival from OHCA across the state of Arizona.

Methods: 9-1-1 audio recordings of confirmed OHCAs and suspected OHCAs (10/2010-6/2013) in 7 large 9-1-1 centers were reviewed using a standardized time-stamp methodology linked with EMS and hospital process and outcome data. There were 2343 pre-implementation cases (P1) and 2291 cases post-implementation of a bundle of care (P2) that included staff training and guideline-based protocol changes, data collection and feedback to providers. Univariate and multivariable analyses were used to assess outcomes between P1 and P2.

Results: There were 2532 OHCAs [1232 P1, 1300 P2; 64% male, median age 62 (IQR: 47-74)]. 83% of cases were identified in P1 compared with 89% in P2 (p<0.001). The rate of telephone-assisted BCPR went from 44% in P1 to 62% in P2 (p<0.001). Time to beginning TCPR instructions decreased from a median of 144 sec (P1) to 126 in P2 (p<0.001). Time to first chest compression also decreased (P1: 178; P2: 155; p<0.001). Outcome data are currently available for 64% of confirmed OHCAs (1630 patient outcomes with 1619 neuro outcomes). Survival was significantly higher in P2 (11.2%) compared to P1 (7.9%; p=0.023), as was good neuro outcome (CPC-1 or 2: 7.7% P2 vs. 4.8% P1 p=0.018). After adjusting for witnessed arrest, shockable rhythms, age, and sex, both survival and good neuro outcome were still significantly higher in P2 vs. P1 [adjusted odds ratios: survival = 1.5 (95% 1.1-2.1); good neuro outcome = 1.7 (95% 1.1-2.6)].

Conclusion: The implementation of a comprehensive statewide TCPR bundle was associated with significant improvements in the rates of telephone-assisted BCPR, survival and good neurologic outcome after OHCA.

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