Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: Continuous compressions vs interrupted compressions in out-of-hospital cardiac arrest.

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Clinical Scenario: You arrive to a scene for a 63y/o male in cardiac arrest, bystander CPR is in progress with continuous compressions. As per your services protocols you start with 30 to 2 compression to ventilation CPR and wonder which form of CPR has better patient outcomes

PICO (Population – Intervention – Comparison – Outcome) Question:
In adult and pediatric OOHCA, which is the better for patient outcome, continuous compressions with ventilations or interrupted compressions with ventilations?

Search Strategy:
Paramedic OR EMS OR Ambulance OR emt AND prehospital OR out of hospital OR ohca OR Cardiac arrest AND Compression rate AND continuous compressions AND interrupted compressions

Search Outcome: 43 total results.

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Gregory M. Thomas MD 2018	58 non traumatic OOHCA patients with a mean age 68 years with a mean age of 68 years. 40 patients received CCC. 18 patients received 30:2.	Retrospective cohort analysis. Level 3 evidence.	Survival to hospital discharge with no neurological deficit.	30:2 0% survival rate after 6 months. CCC 30% survival rate after 6 months.	Sample size of CCC patients vs. 30:2 CPR. Sample size extremely small. Unknown cardiac arrest etiologies aside from traumatic. Some patients received bystander CPR and some did not.
Nichol G. 2015	23,711 adult patients with non-trauma related out-of-hospital cardiac arrest.	Randomized control trial, level 1 evidence.	Survival to hospital discharge, neurological outcomes, measured with rankin scale.	9% survival in the continuous chest compression group 9.7% survival in the interrupted chest compression group (p= 0.07) 7% survived with 3 on rankin scale	Imbalanced numbers between intervention and control groups. Post resuscitation care was not controlled. Oxygenation/ventilation was not controlled.

				7.7% survived with 3 on rankin scale (p=0.09)	
Tom F. Brouwer, MD; Robert G. Walker, BA; Fred W. Chapman, PhD; Rudolph W. Koster, MD, PhD. 2015	319 patients with ventricular tachycardia/fibrillation out-of-hospital cardiac arrest	Randomized control trial, level 1 evidence.	Strategies shortening the longest pauses in CPR may improve outcome.	37.9% did not differ significantly for the group of 98 excluded cases. A total of 93% were discharged with a good neurological outcome	Only assessed association between pauses and survival and cannot establish a casual relationship. Data did not allow identification of the reason for prolonged nonshock or perishock chest compression pauses.

Comments: Keeping in mind that each different EMS system has different protocols outside of the trial, in regards to Airway management, ROSC care, ETC. Each one of these trials varied factors that could affect the outcomes, such as cause of arrest, bystander CPR and quality, time from EMS dispatch to arrival on scene, making any conclusion of the trials to be viewed with some skepticism.

Consider: The evidence is not compelling enough to sway clinical practice. They are very marginal in their differences and either way would still lead to a good outcome for hospital discharge and sufficient neurological outcomes

Clinical Bottom Line: There is no statistical difference in continuous compression versus interrupted compressions.

References:

Nichol, G., Leroux, B., Wang, H., Callaway, C. W., Sopko, G., Weisfeldt, M., Stiell, I., Morrison, L. J., Aufderheide, T. P., Cheskes, S., Christenson, J., Kudenchuk, P., Vaillancourt, C., Rea, T. D., Idris, A. H., Colella, R., Isaacs, M., Straight, R., Stephens, S., Richardson, J., … ROC Investigators (2015). Trial of Continuous or Interrupted Chest Compressions during CPR. *The New England journal of medicine*, *373*(23), 2203–2214. https://doi.org/10.1056/NEJMoa1509139

Gregory M. Thomas, M.D., James T. Prescott, M.D.University of Kansas School of Medicine,Department of Family and Community Medicine. KANSAS JOURNAL of MEDICINE, Comparison of Continuous Versus Interrupted Chest Compressions during CPR in a Rural Community, South Central Medical Education Network Site, McPherson, KS. (2018)

Brouwer, T. F., Walker, R. G., Chapman, F. W., & Koster, R. W. (2015). Association Between Chest Compression Interpretations and Clinical Outcomes of Ventricular Fibrillation Out-of-Hospital Cardiac Arrest. American Heart Association.