

Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: Mechanical CPR Devices

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Clinical Scenario:

An ALS unit is dispatched to a scene for a chest pain call. On arrival the crew finds a male mid 50's VSA. There is no second crew available to provide support. Transport time to hospital is 20min. The crew wonder if this resuscitation could be more successful if they had a mechanical CPR device available.

PICO (Population – Intervention – Comparison – Outcome) Question:

I patients in cardiac arrest, does the use of mechanical CPR vs. manual CPR result in decreased mortality and decrease exhaustion of EMS personnel?

Search Strategy:

((prehospital OR ambulance OR "emergency medical services" OR paramedic))
AND ("mechanical CPR" OR LUCAS OR "CPR device")

Search Outcome:

87

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Satterlee PA 2013	631 cardiac arrests	Retrospective	ROSC	ROSC was documented in 31% of arrests that used the LUCAS device and 41% of those that used manual CPR. P=.31 none significantly different.	+EMS staff did not know that they were in a study.
	6538 subject in trial	Meta-analysis	ROSC	Load	Large

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Westfall M				distributing band had greater odds of ROSC than manual (odds ratio, 1.62 [95% CI, 1.36, 1.92], p < 0.001) Piston driven had similar odds of ROSC as manual (odds ratio, 1.25 [95% CI, 0.92, 1.68]; p = 0.151)	homogeneous data sample

Comments:

All trials were on adults with ROSC as the measured of out comes

Consider: *Why would you NOT change practice, based on this article?*

The studies only looked at ROSC as the outcome. None looked at the safety of EMS staff or if number of EMS staff on scene had a role.

Clinical Bottom Line:

The evidence indicates that mechanical CPR devices can provide high quality chest compressions that give patients an increased chance of ROSC. The load distributing band appears superior to other mechanical methods. There needs to be more research conducted to determine if there is increased safety for the EMS staff.

References:

Westfall M¹, Krantz S, Mullin C, Kaufman C. Mechanical versus manual chest compressions in out-of-hospital cardiac arrest: a meta-analysis. Crit Care Med, 2013; 41(7):1782-9.

Satterlee PA¹, Boland LL, Johnson PJ, Hagstrom SG, Page DI, Lick CJ. Implementation of a mechanical chest compression device as standard equipment in a large metropolitan ambulance service. J Emerg Med, 2013; 45(4):562-9.



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