Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Prehospital administration of Naloxone during cardiac arrest due to suspected opioid overdose*

Report By: *Chantal Samson*

2nd Party Appraiser: *Jen Greene*

Clinical Scenario:
Paramedics arrive on scene, at 3 am, for a 30-year-old male in cardiac arrest. There are no signs of trauma. The tiny apartment is filled by paramedics, fire fighters and family. The patient is in a seating position, on the couch, directed towards a television that has the volume turned up. The first thing to be noticed is the cyanosis around his lips and fingers. The family last scene him an hour ago when they went to bed. The patient is warm to touch but, pulseless. The patient is immediately moved to the ground and resuscitation attempts have begun. The family states that the patient is relatively healthy, other than his previous drug addiction to opioids, for which he has currently been 6 months sober. Patient has a take home steel box of methadone, that his family help him with daily. They state there's an excess amount that has been taken from the bottle. During resuscitation attempts, patient is administered Naloxone. The purpose of this medication is to counter act the opioid overdose by blocking its effects.

PICO (Population – Intervention – Comparison – Outcome) Question:
In patients during cardiac arrest, in prehospital settings, who are administered Naloxone over those who were not given the medication, was the outcome more favorable?

Search Strategy:
(prehospital OR out-of-hospital) AND (cardiac arrest OR ca OR resuscitation OR cpr) AND (opioid overdose OR overdose OR od) AND (Naloxone OR Narcan)

Search Outcome:
17 results

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Matthew D. Saybolt, 2009	*36 adult EMS patients in cardiac arrest due to suspected opioid overdose.* *!5/36 received Naloxone 21/36 did not receive Naloxone.*	*Retrospective study without randomized patients.* *Level of evidence noticed: Level III* *Direction of Evidence: Yellow*	- *Change in ECG post tx in cardiac arrest.* - *Immediate change in ECG.* - *Delayed change in ECG.* - *Improved perfusion rhythm.* - *Survival to admin at hospital.* - *Survival to discharge.*	*47% ECG changes immediately with tx.* - *20% had perfusing rhythms.* - *53% delayed change.* - *27% survived to admin* - *1% survived discharge.*	- *While this article seemed to have many great ideas, for the time the study was done (5 years), the sample size was extremely small.* - *It did stay true to EMS setting with specific opioid overdoses.* - *Too many variables were thrown in and they continued to decrease the sample size by becoming increasingly specific to ECG changes.* - *In the end there was concise data to prove or disprove theory.* - *Study was hard to follow due to*

					weakening sample size.
Steven Allen Sumner, 2015	124 adult EMS patients confirmed cardiac arrest with opioids. 82 patients received Naloxone. 42 did not receive Naloxone.	Retrospective study Level of Evidence: Level III Direction of Evidence : Yellow	- Received Naloxone - Did not received Naloxone - Below the age of 30. - Between ages 30 – 50. - Above the age of 50. - Evidence of opioid paraphernalia. - - Without evidence of paraphernalia. - Female vs Male	- 66.1% received Naloxone. - 33.9% did not receive Naloxone. - 75% with confirmed opioids in their system that received Naloxone. - 86.7% under the age of 30 received Naloxone. - 65.4% between ages of 30-50 received. - 52.4% over the age of 50 received. - 46.9% females received. - 74.2% males received. - 55.6% without signs of drug abuse received. - 86.1% with signs of drug abuse received.	- While this article was also very interest, it remained quite misleading and hard to follow. - The article immediately presumed the Naloxone would increase odds of survival, without evidence or knowledge shown. - The case study was done on deceased pts and not live ones for proven outcome. - Started out with decent sample size, but then continuously regrouped multiple times. - Statistics were listed but no defined questions answered.

Comments:

- Both articles stayed true the EMS patients solely brought in in cardiac arrest with opioid influences.
- Both articles broke down their sample sizes into much smaller groups that did not remain true to the fact of the article.
- Each had their own approach to the subject. One chose to consider survival rates and ECG changes. While the other chose to denote biases when treating these specified patients, based on age, sex and evidence of drug abuse.
- Neither article came to a defined conclusion.

Consider: *Why would you NOT change practice, based on these articles?*
For this purpose, that does seem like the loaded question that has ended each article. While it seems like a very hot topic, due to the increasing rise in opioid overdoses, there does not seem to be many studies done on the subject.
I have personally been in these situations where Naloxone was administered in cardiac arrest, and in those that have not. I have not been able to remark a difference with the medication or without. Although, I am just an individual who does not have the statistics or population size to create a proper case study. I personally am not entirely sure that it would have an effect in a body where proper blood flow and metabolism wasn't in effect. Again, I have yet to find a study that reinforces or negates my beliefs.
In the end, if you can identify an arrest due to opioid overdose, there isn't a reason not to administer Naloxone. If the situation arose where I either had to capability to administer the drug or preform another task that is of greater necessity with the proper evidence to back it up, I would choose the latter.

Clinical Bottom Line:
It turned out that there were no definite results available. While both article were very intriguing and took on each a different perspective of their study, neither could give confident results. In the end, there turned out to not be enough data to say whether the administration of the drug made a difference. In most cases it was seen more as a question; Why not administer the medication? It bodes no harm either way and it may have favorable outcomes, it just has not yet been proven.

References:

Steven Allan Sumner, Melissa C. Mercado-Crespo, M. Bridget Spelke, Leonard Paulozzi, David E. Sugerman, Susan D. Hillis & Christina Stanley (2016) Use of Naloxone by Emergency Medical Services during Opioid Drug Overdose Resuscitation Efforts, Prehospital Emergency Care, 20:2, 220-225, DOI: 10.3109/10903127.2015.1076096

*Matthew D. Saybolt, Scoot M. Alter, Frank Dos Santos, Diane P. Calello, Kevin O. Rynn, Daniel A. Nelson, Mark A Merlin (2009) Naloxone in cardiac arrest with suspected opioid overdoses**