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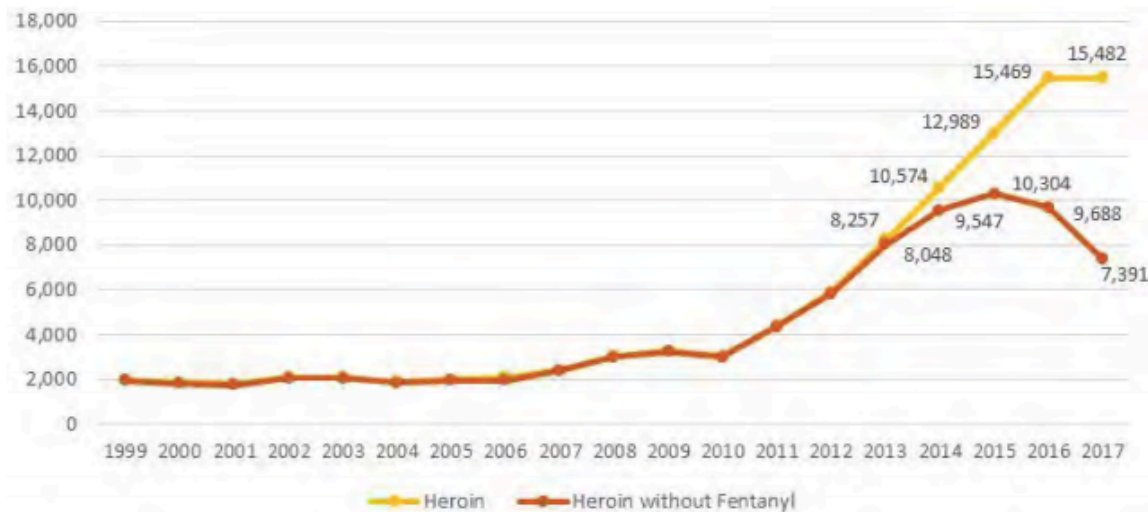
**Sidney Kimmel
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Cardiac Arrest Clinical Outcomes in Patients Presenting with Opioid Overdose

Andrew Toron, Dr. David Gaieski, Dr. Morgan
Hutchinson*

- Opioid overdoses are a risk factor for adverse cardiac events and lengthy hospital visits^{1, 2}
- Impacts anybody who takes opioids, such as patients on treatment regimens involving opioids, including prescriptions

Figure 15. Heroin-Involved Overdose Deaths With and Without Fentanyl, 1999 – 2017



From the Drug Enforcement Administration from 2019⁶



Introduction

- Gaps in data about how opioid treatments affect public health³
- Survival rates, neurological function, and treatment strategies for out-of-hospital cardiac arrest patients are well described, but few studies have specifically examined the association of these cardiac arrests with opioid overdoses^{4, 5}
- This study fills in some gaps about how opioid-induced cardiac arrests compare to ones of other etiologies

Objectives & Hypothesis

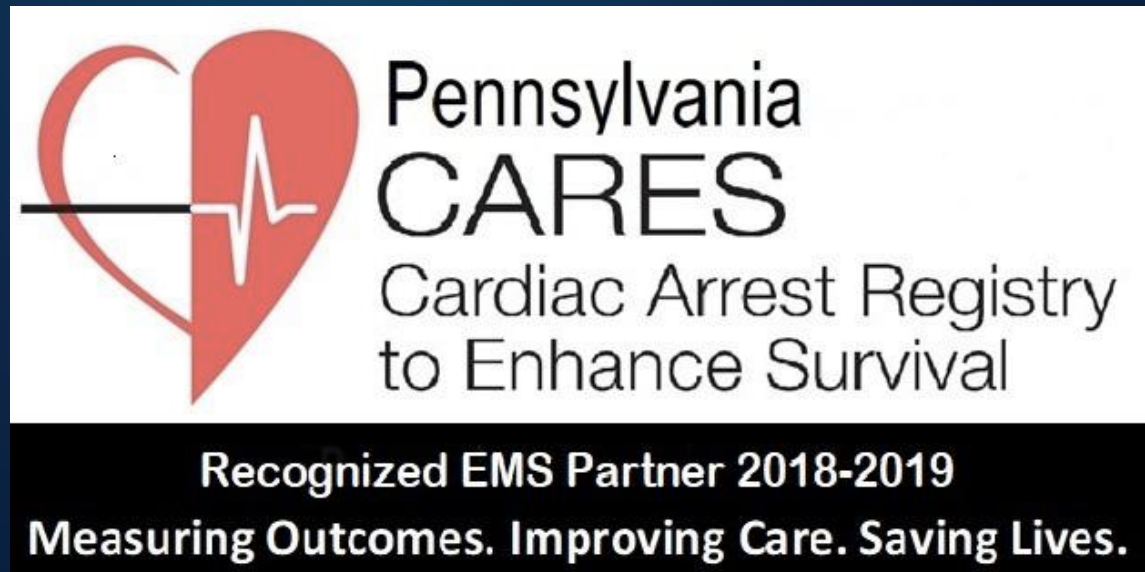
- Research Question
 - How much more severe are out-of-hospital cardiac arrests related to opioid overdose in comparison to ones of cardiac etiology?
Specifically, does opioid overdose correlate to longer hospital stays and worse outcomes for these patients?
- Hypothesis
 - Cardiac arrests caused by opioid overdoses will likely lead to higher mortality rate and longer hospital stays than other cardiac arrests.

Approach & Results

- Study design: secondary data analysis
- Population/study sample: patients presenting to Jefferson/Methodist hospitals with an out-of-hospital cardiac arrest due to opioid overdose since 2017
- Intervention: not applicable
- Comparison group: patients presenting to the same hospitals with an out-of-hospital cardiac arrest due to cardiac etiologies since 2017
- Outcome: mortality rate and length of hospital stay

Approach & Results

- Data source: Cardiac Arrest Registry to Enhance Survival (CARES)
- Collection: gathered patient data from this registry and separated the patients based on etiology



Approach & Results

- Rationale for approach:
 - CARES has data on cardiac arrest patients, including clinical outcomes
 - Indicates drug/opioid overdose when relevant
 - Has TJUH data, Pennsylvania data, and national data → potential for future comparisons
 - This study only included TJUH/Methodist data so we could verify and expand upon the data in CARES if needed

- Chi-square used for mortality outcome
- Unpaired t-test used for length of hospital stay

- The mortality rate of the patients in the opioid overdose group (94.29%) was not significantly different than that of patients in the cardiac etiology group (93.02%) ($p=0.820886$).
- The length of hospital stay for the opioid group (mean = 1.71 days) was likewise not significantly different than that of the cardiac etiology group (mean = 2.74 days) ($p = 0.2556$).

Findings – Mortality

	Died in ED/Hospital	Discharged Alive	Marginal Row Totals
Opioid Etiology	33 (32.76) [0]	2 (2.24) [0.03]	35
Cardiac etiology	40 (40.24) [0]	3 (2.76) [0.02]	43
Marginal Column Totals	73	5	78 (Grand Total)

The chi-square statistic is 0.0513. The p-value 0.820886. Not significant at $p < 0.05$.

The chi-square statistic with Yates correction is 0.0568. The p-value is 0.811632. Not significant at $p < 0.05$.



Findings – Hospital Stay

Group	Opioid Etiology	Cardiac Etiology
Mean	1.71	2.74
SD	2.41	4.85
SEM	0.41	0.74
N	35	43

SD = standard deviation, SEM = standard error of the mean

The mean of opioid etiology minus cardiac etiology was -1.03 days. 95% confidence interval of this difference is -2.82 to 0.76.

T = 1.1455, and the two-tailed p-value was 0.2556. These results are not statistically significant.



Conclusions

- Opioid-induced cardiac arrests have similar outcomes when compared to other cardiac arrests
- This study compared outcomes of cardiac arrests of different etiologies, which may have implications on prognosis for these patients.
- This will help to fill in gaps in data about how the opioid epidemic affects public health.

Conclusions

- The results do not support the hypothesis.
- This does not discount the severity of the opioid crisis, but instead suggests that opioid-induced cardiac arrests are not necessarily more severe than other cardiac arrests.

Future Directions

- Larger sample size
- A next step may be to expand the data to other hospitals, or perhaps to all of Pennsylvania

Acknowledgements

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