

Paramedic - Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Early IV epinephrine in OCHA presenting in VF/VT*

Report By: *Alexander Hurst*

2nd Party Appraiser: *Jen Greene*

Clinical Scenario: *You are dispatched to a 58 year old male in cardiac arrest and on arrival you find a PCP crew who has been performing CPR for 2 minutes and has established IV access. The initial rhythm is VF. You contemplate when to administer epinephrine.*

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

P-*Adult OHCA presenting with VF/VT*

I-*Early administration of IV epinephrine*

C-*Delayed administration of IV epinephrine*

O-*Survival to hospital discharge*

Search Strategy:

1=*PUBMED "early epinephrine in shockable rhythms"*

2=*AHA circulation journals "timing of epinephrine"*

3=*JIBC Online Library "Early epinephrine and OHCA"*

Search Outcome:

PUBMED=20

AHA Circulation Journals=8

JIBC library=111



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Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
<p>Early administration of epinephrine (adrenaline) in patients with cardiac arrest with initial shockable rhythm in hospital: propensity score matched analysis</p> <p>Anderson, L., Kurth, T., Chase, M., Berg, K., Cocchi, M., Callaway, C., & Donnino, M. 2016</p>	<p>2978 in hospital patients who suffered a VF/VT cardiac arrest</p>	<p>-Prospective observational cohort study</p> <p>-Level 2-Green</p>	<p>Primary outcomes were survival to hospital discharge</p> <p>Secondary outcomes were ROSC, and survival to hospital discharge with a good neurologic outcome</p>	<p>EPI within 2 minutes:</p> <p>-31% survival rate, OR of 0.45, 95% CI 0.41 to 0.56; P<0.001</p> <p>-67% of pts achieved ROSC, OR of 0.55, 0.46 to 0.65; P<0.001</p> <p>-25% of patients had a good neurological outcome, OR of 0.48, 0.41 to 0.56; P<0.001</p> <p>EPI after 2 minutes:</p> <p>-48% survival rate, OR of 0.45, 95% CI 0.41 to 0.56; P<0.001</p> <p>-79% of pts achieved ROSC, OR of 0.55, 0.46 to 0.65; P<0.001</p> <p>-41% of patients had a good neurological outcome, OR of 0.48, 0.41 to 0.56; P<0.001</p>	<p>Strengths:</p> <p>-Large patient population</p> <p>-300 different hospitals involved</p> <p>Weaknesses:</p> <p>-Slight variances in some patient medical conditions</p> <p>-Not a RCT</p>



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<p>Effects of adrenaline on rhythm transitions in out-of-hospital cardiac arrest</p> <p>Neset, A., Nordseth, T., Kramer-Johnsen, J., Wik, L., and Olasveengen, T. 2013</p>	<p>849 adult non-traumatic OHCA</p>	<p>Post hoc analysis performed on data from a prospective, randomised trial</p>	<p>The primary outcome was to compare ECG rhythm changes during cardiac arrest in relation to IV epinephrine administration</p>	<p>Epinephrine Group: -24% of these patients had one or more fibrillations after ROSC, P=0.03 -90% had fibrillations after asystole/PEA, P=0.001 -The average number of rhythm transitions was 8</p> <p>Non-Epinephrine Group: -12% of these patients had one or more fibrillations after ROSC, P=0.03 -69% had fibrillations from asystole/PEA, P= 0.001 -The average number of rhythm transitions was 5</p>	<p>Strengths: -Patients were randomized -Was done prehospital</p> <p>Weaknesses: -Small patient population -The initial trial was IV vs. no IV so the paramedics were not blinded -The non-epinephrine group received no medications as there as no IV access.</p>
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Comments: There is limited data on this particular subject, but there is enough evidence regarding epinephrine's potential complications to warrant further research.

Consider: I would consider a practice change based on these studies and the current AHA guideline recommendations that note it is reasonable to withhold epinephrine until the initial defibrillation attempts have been unsuccessful. More specific research would help clarify this scenario.

Clinical Bottom Line: I would on a case by case basis, consider delayed administration of IV epinephrine based on the current research available.



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References:

Andersen, L.W., Kurth, T., Chase, M., Berg, K.M., Cocchi, M.N., Callaway, C., Donnino, M.W., & American Heart Association's GetWith The Guidelines-Resuscitation Investigators. (2016). Early administration of epinephrine (adrenaline) in patients with cardiac arrest with initial shockable rhythm in hospital: Propensity score matched analysis. *BMJ (Clinical Research ed.)*, 353, i1577. <https://doi.org/10.1136/bmj.i1577>

Neset, A., Nordseth, T., Kramer-Johansen, J., Wik, L., & Olasveengen, T.M. (2013). Effects of adrenaline on rhythm transitions in out-of-hospital cardiac arrest. *Acta Anaesthesiologica Scandinavica*, 57(10), 1260-1267. <https://doi-org.libproxy.jibc.ca/10.1111/aas.12184>

Panchal, A.R., Berg, K.M., Hirsch, K.G., Kudenchuck, P.J., Del Rios, M., Cabanas, J.G., Link, M.S., Kurz, M.C., Chan, P.S.,

Morely, P.T., Hazinski, M.F., & Donnino, M.W. (2019). 2019 American Heart Association focused update on advanced cardiovascular life support: Use of advanced airways, vasopressors, and extracorporeal cardiopulmonary resuscitation during cardiac arrest: An update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*, 140(24), 881-894. <https://doi.org/10.1161/CIR.0000000000000732>

