

# Paramedic - Evidence Based Medicine (P-EBP) Program

## Paramedic CAT (Critically Appraised Topic) Worksheet

**Title:** Does routine application of defibrillation pads in STEMI patients that suffer OHCA result in reduced time to defibrillation and improved outcomes.

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**Clinical Scenario:** You respond to a 60-year-old male patient who is complaining of 9/10 crushing chest pain. He is alert and oriented but pale, diaphoretic, and dyspneic. A 12-Lead ECG is obtained, and it reveals an anterolateral STEMI. You administer ASA, sublingual nitroglycerin, and initiate transport. Your transport time to the nearest PCI facility is 20 minutes.

Would you apply defibrillation pads to this patient once STEMI is diagnosed?

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

In patients that are diagnosed with STEMI by paramedics in the prehospital setting (P), does routine application of defibrillation pads (I), result in reduced time to defibrillation, higher rates of ROSC, and improved survival to discharge? (O)

### **Search Strategy:**

In PubMed:

"stemi" AND "ohca" AND "defibrillation" AND "pads" = 1 hit

"PADS ON PROTOCOL" and "STEMI" and ARREST\* = 2 hits

### **Search Outcome:**

Initially 1 hit... 2<sup>nd</sup> article found through “similar articles”



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## Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
<b>Felder, 2020</b>	446 patients diagnosed with prehospital STEMI.  11 suffered OHCA.	Retrospective case control review to evaluate effects of "pads-on protocol".  LOE II	Decrease in time to initial defibrillation in patients suffering OHCA	In 4 patients treated with "pads-on protocol", the mean time to defibrillation was 17.7, compared to 72.7 seconds in patients who had pads applied following arrest.  {95% CI 22.7-88.2 s}	<p><b><u>Strengths</u></b> Specific to paramedic practice.</p> <p>Large paramedic service over 4 years (London).</p> <p>Statistically and clinically significant findings</p> <p><b><u>Weaknesses</u></b> Small sample size</p> <p>Study not designed to show survival benefit.</p> <p>Not powered to control for variables such as transport time, type of crew, patient age, and comorbidities.</p> <p>Reliant on documented times by paramedics.</p>



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<p><b>Osei-Ampofo, 2016</b></p>	<p>Case report – Two cases of prehospital STEMI complicated by VF.</p>	<p>Case series of two cases – one <i>before</i> pads-on protocol was initiated, and one <i>after</i> the protocol was applied.</p> <p>LOE III</p>	<p>Cases presented with time to first shock and time to return of spontaneous circulation as the focus.</p>	<p>The cases demonstrate that application of pads immediately following diagnosis of STEMI has potential to decrease time to shock.</p>	<p><b>Strengths</b> Thorough analysis of two prehospital cases</p> <p>Is corroborated by the Felder (2020) study.</p> <p><b>Weakness</b> Small sample size.</p> <p>Unable to determine effects on patient outcomes</p>
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**Comments:**

No other studies specifically focusing on this topic were found. Both studies acknowledge that a stronger, prospective, randomized trial would be beneficial to further validate the results.

**Consider:**

The protocol is simple and easy to implement. Considerations for changes to practice include cost-benefit analysis and paramedic/patient safety. Increased application of defibrillation pads that may not be used could result in increased costs, although it is noted many pads expire and are not used anyway. Earlier delivery of shock may avoid safety concerns associated with CPR during transport by decreasing the time that CPR must be performed.

**Clinical Bottom Line:**

This intervention is able to reduce time to defibrillation by 55 seconds. Each minute delay correlates with a 7-10% decrease in patient survival to hospital discharge. It would be reasonable for ambulance services to implement a “pads-on-protocol” for patients diagnosed with STEMI, in an attempt to reduce time to initial defibrillation and ROSC.



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## **References:**

Felder, S., VanAarsen, K., & Davis, M. (2020). Decreasing time to first shock: Routine application of defibrillation pads in prehospital STEMI. *CJEM*, 22(1), 82-85. doi:10.1017/cem.2019.408

Maxwell Osei-Ampofo, Sheldon Cheskes, Adam Byers, Ian R. Drennan, Jason E. Buick & P. Richard Verbeek (2016) A Novel Approach to Improve Time to First Shock in Prehospital STEMI Complicated by Ventricular Fibrillation, *Prehospital Emergency Care*, 20:2, 278-282, DOI: [10.3109/10903127.2015.1076100](https://doi.org/10.3109/10903127.2015.1076100)

