

**Paramedic CAT (Critically Appraised Topic)**

**Title:** Use of Double Sequential Defibrillation in Prehospital Cardiac Arrest

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**Clinical Scenario:**

Paramedics are called for an out of hospital cardiac arrest of a 68 year old male patient currently in V-Fib. The paramedics start resuscitation efforts, using all available resources at their disposal. The patient remains in V-Fib. They apply a second defibrillator and attempt to convert the patient’s V-fib using a double sequential defibrillation (DSD). The patient is converted into a perfusing rhythm, and ROSC is achieved.

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

- In patients in OOHCA with refractory V-Fib does the use of double sequential defibrillation compared to no use of double sequential defibrillation improve mortality?

**Search Strategy:** (prehospital OR out-of-hospital) and (cardiac arrest OR refractory Ventricular Fibrillation) and (double sequential defibrillation)

**Search Outcome:** 9 results

**Relevant Papers:**

<b>AUTHOR, DATE</b>	<b>POPULATION: SAMPLE CHARACTERISTICS</b>	<b>DESIGN (LOE)</b>	<b>OUTCOMES</b>	<b>RESULTS</b>	<b>STRENGTHS/WEAKNESSES</b>
Eric Cortez, 2016	12 Adults resuscitated in OOHCA with refractory V-Fib using DSD	Retrospective look at patients greater than the age of 17, that had a ROSC, conversion from VF, survival to out of hospital discharge, and Cerebral Performance	ROSC in patient with refractory V-Fib  Converted out of Refractory V-Fib  Survival to hospital discharge	3 pts had a ROSC  9 pts converted out of refractory V-Fib  3 survived to out of hospital discharge	-Could Have used a bigger sample size  +good data looking out outcomes of each patient  -variation in care between each patient  -pts not randomized  -no comparison group

		Category Score (LOE3)	Cerebral Performance Category Score at discharge	2 pts had a CPC score of 1 1 patient had a CPC of 3	
Mark A. Merlin, 2016	7 Adults in OOHCA experiencing three episodes of refractory V-Fib shocked with DSD	Retrospective look, using a control group but no randomization (LOE 3)	Conversion from V-Fib Survival to admission to hospital Neurological disability on discharge CPC score in all pts	5 had a conversion from V-Fib after DSD 4 survived to admission to hospital 3 had little to no disability on discharge 1 had very good CPC score 5 had brain death	-Small sample size +Good data collection and examination of results -no randomization of pts +all pts had DSD used during resuscitation -no comparison group -different treatment leading up to use of DSD

**Comments:**

- most patients converted out of refractory ventricular fibrillation after the use of DSD
- The earlier DSD was used the better the outcome for the patient
- Age did not seem to be a factor in patient outcome or conversion from V-Fib
- High quality CPR increased chances of conversion and survival outcomes

**Consider:**

There was a little bit of drift from the original question. All of the studies examined looked at discharged from the hospital, as well as cerebral performance category score. Looking at the results based on these findings, it would appear that, the earlier the use of DSD was implemented, the better the patient outcome was found. I can support the addition of the use of DSD in refractory V-Fib OOHCA, however more research is needed. A larger sample size is needed as 19 patients is a very low number to do a comparison with. Also randomizing the patients would help further prove whether the use of DSD would improve outcomes in OOHCA with refractory V-Fib. A standing protocol to follow as well would help improve the data collecting since every patient in both studies had a varying number of single defibrillator shocks delivered as well as a, varying amount of ACLS drugs used on each patient. More control over the study needs to be done before I feel this can or will be implemented as a protocol in the future.

**Clinical Bottom Line:**

While promise is shown that patient outcome from OOHCA with refractory V-Fib can be improved with the use of DSD, more research is needed to see if there is any real benefit to the use of DSD.

**References:**

Mark A. Merlin, Ammundeep Tagore, Robert Bauter & Faizan H. Arshad (2016) A Case Series of Double Sequence Defibrillation, *Prehospital Emergency Care*, 20:4, 550-553  
DOI:10.3109/10903127.2015.1128026

Eric Cortez, William Krebs, James Davis, David P. Keseg, Ashish R. Panchal (2016) Use of double sequential external defibrillation for refractory ventricular fibrillation during out-of-hospital cardiac arrest, *resuscitation* 108(2016) 82-86  
<http://dx.doi.org/10.1016/j.resuscitation.2016.08.002>