Ultrasound in Pre-hospital Cardiac Resuscitation

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Pre-hospital U/S

• *IS THIS TECH USEFUL?*

• *WHERE / SHOULD WE USE IT IN EMS?*
Pre-hospital U/S

- *Where are we in ground-based EMS?*


Price DD, Wilson SR, Murphy TG.


Melson SW, McCarthy J, Stromski CJ, Kostenbader J, Heller M.


Heegaard W, Plummer D, Dries D, Frascone RJ, Pippert G, Steele D, Clinton J.

Early Adopters

EMS Profile: Odessa Fire Department

- TX: Early 2000’s adopted pre-hospital U/S, recognized at 1st World Congress of U/S in Milan in ‘05 for 1st PM U/S program in world

- Then what happened??
Why cardiac arrest?

• One pre-hospital disease process where entirety of initial resuscitation occurs outside of ED!!

• WORK ‘EM WHERE YOU FIND ‘EM!!
Can we train to do it right?

- 9-1-1 Medics trained in FAST & AA U/S
- 6hr course, all scans in “back of the bus” enroute to ED
- 104 scans, 20 AA & 84 FAST- 8/104 PM no image
- 100% agreement b/n MD and Medic
Do EMS systems see it useful?

- Cross section survey of NAEMSP EMS directors
- 30% response 225 of 755
- 22% of respondents considering U/S!
- Most common indicators for use- FAST & PEA
Is there science for it?

Outcome in cardiac arrest patients found to have cardiac standstill on the bedside emergency department echocardiogram.

Blaivas M, Fox JC.

- 169 pts enrolled, subxiphoid or parasternal view
- 136 echo confirmed cardiac standstill/ 52% had rhythm
- NO pt w/ cardiac standstill survived regardless of initial presenting ED rhythm
- PPV w/ standstill for death ➔ 100%
Is there science for it?


Does the presence or absence of sonographically identified cardiac activity predict resuscitation outcomes of cardiac arrest patients?

Salen P1, Melniker L, Chooljian C, Rose JS, Alteveer J, Reed J, Heller M.

- Only looked at PEA & Asystole pts
- 70 pts → 36 Asys/34 PEA
- No cardiac activity = OMI regardless of rhythm
- Time interval for efforts by EMS or ED no predictors of ROSC
Is there science for it?

Cardiac movement identified on prehospital echocardiography predicts outcome in cardiac arrest patients.

Aichinger G¹, Zechner PM, Prause G, Sacherer F, Wildner G, Anderson CL, Pocivalnik M, Wiesspeiner U, Fox JC.

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- U/S inexperienced European EMS MDs, 2 hr EE course
- 1 subxyph view, +motion=anything Fib→organized rate
- 42 pts, all w/ adequate cardiac views
- + positive cardiac motion associated w/ survival
- Cardiac standstill, AT ANY TIME, PPV 97.1% for death
Subxyphoid View
Parasternal Long
Pre-hospital U/S

• IS THIS TECH USEFUL?
• WHERE SHOULD WE USE IT IN EMS?
IN CLOSING

• U/S in EMS should START w/ CARDIAC ARREST
• TOR is difficult w/ some cases. This tech can help!
• We can learn this skill in EMS
• Cost, size, durability
• Usefulness can be applied to many conditions
• REASON 1 trial www.clinicaltrials.gov caveat
• Stay tuned for ABQ experience- prospective pilot.
Thank You

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• QUESTIONS?