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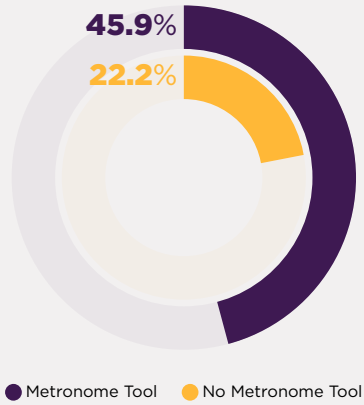
EMERGENCY DISPATCH RESEARCH AT WORK

RESEARCH BRIEF

AN IAED STUDY SHOWED THAT AN AUTOMATED SOFTWARE METRONOME TOOL IS HIGHLY EFFECTIVE IN GETTING LAYPERSON-CALLERS TO ACHIEVE HIGH-PERFORMANCE COMPRESSION RATES, IMPROVING THE QUALITY OF THE CPR GIVEN.

The metronome difference

PERCENTAGE OF CALLERS ACHIEVING HIGH PERFORMANCE COMPRESSION RATE
(100-120 CPM)



DOES USE OF THE COMPRESSIONS MONITOR DIAGNOSTIC TOOL BY EMDs ENHANCE THE ABILITY OF CALLERS TO PERFORM CPR?

Yes! When used with Pre-Arrival Instructions, the Tool significantly improves callers' ability to achieve high-performance CPR compression rates.

The earlier, the better. Out-of-hospital cardiac arrest (OHCA) is both pervasive and deadly. The American Heart Association (AHA) estimates more than 356,000 OHCAs occur in the United States per year. Of these cases, about 90% are fatal.[1] Bystander CPR can save the life of an OHCA patient—however, time is of the essence.

It has been said that the fastest ambulance in the world cannot reach the scene more quickly than an emergency dispatcher. Indeed, emergency medical dispatchers (EMDs) can intervene in these time-critical OHCA cases with Dispatcher-Directed CPR (DD-CPR).[2]

The ability of a trained EMD to guide a layperson caller through bystander CPR is an extremely important development. With DD-CPR, an OHCA patient can receive effective, early treatment even before an ambulance arrives, and this early treatment could make all the difference with respect to the patient's survival.

Don't forget about quality. But good care is not all about minimizing delays. Research demonstrates that good care is also about quality (i.e., how well the CPR is performed). In fact, CPR quality and chance of patient survival are tied together—the performance of high-quality CPR is a major factor influencing survival from cardiac arrest.[3]

There are a few useful measures of quality CPR, but one of the most important is the compression rate: How many compressions per minute (cpm) is the rescuer giving the OHCA patient? Currently, the AHA recommends that patients receive 100–120 cpm.[4] If a rescuer does not give their compressions within this window, then typically they are not performing CPR that is as effective as it needs to be.

> **THE PERCENTAGE OF CALLERS THAT ACHIEVED A TARGET COMPRESSION RATE MORE THAN DOUBLED WHEN THESE PERSONS WERE HELPED BY THE TOOL.**

High-quality study, high-quality CPR. Research generally begins with a good question. For the IAED™ research team, that question was: Can a tool in a medical dispatch protocol system help layperson-callers better administer CPR?

To answer this, the team studied the Compressions Monitor Diagnostic Tool, which is available to EMDs using the software version of the Medical Priority Dispatch System™ (MPDS®). The Tool aids EMDs who are instructing callers to provide compressions during CPR: In short, a software metronome provides the right pace or beat (100 cpm) to the EMD, which is then relayed to the caller to improve their CPR performance. Also, the Tool is used to monitor DD-CPR compression rates.

The Tool works! The IAED research team used the highest quality method in medical research, the randomized controlled trial (RCT), to examine the impact of the Diagnostic Tool on the compression rate and depth. RCTs are considered high-quality evidence because they reduce bias through randomly assigning participants into either a control (no metronome tool is used) or experimental group (metronome tool is used).

Study results indicated the Tool convincingly improved layperson-caller CPR performance.[5] Most importantly, the team found that laypersons demonstrated significant improvement in meeting the target compression rate for high-quality CPR (*see infographic*). In fact, the percentage of callers that achieved a target compression rate more than doubled when these persons were helped by the Tool. Additionally, it was found that the Tool did not adversely impact compression depth.

How far have we come? Not too long ago, many considered it too risky for emergency dispatchers to instruct callers to perform CPR. But things have changed—now the standard view is that DD-CPR can and should be done by EMDs with the right training (EMD certified) and the appropriate tools (ProQA® MPDS) and instructions (scripted PAIs). Guidelines put out by major health organizations like the AHA and European Resuscitation Council (ERC), which emphasize the role of dispatching in improving OHCA survival, support this idea that emergency dispatchers are more than an early access point in the chain of survival. They also significantly shape the prehospital care these critical patients receive.

FOR MORE INFORMATION:

1. American Heart Association. Heart disease and stroke statistics—2018 update. *Circulation*. 2018;137:e67-e492.
2. Heward A, Damiani M, Hartley-Sharpe C. Does the use of the Advanced Medical Priority Dispatch System affect cardiac arrest detection? *Emerg Med J*. 2004 Jan;21(1):115-8.
3. Wallace SK, Abella BS, Becker LB. Quantifying the effect of cardiopulmonary resuscitation quality on cardiac arrest outcome. *Circ Cardiovasc Qual Outcomes*. 2013;6:148-156.
4. American Heart Association. CPR and ECC guidelines Part 5: Adult Basic Life Support (BLS) and Cardiopulmonary Resuscitation (CPR) quality. American Heart Association website. 2019. Accessed October 2, 2020. eccguidelines.heart.org/circulation/cpr-ecc-guidelines/part-5-adult-basic-life-support-and-cardiopulmonary-resuscitation-quality
5. Scott G, Barron T, Gardett I, et al. Can a software-based metronome tool enhance compression rate in a realistic 911 call scenario without adversely impacting compression depth for dispatcher-assisted CPR? *Prehosp Disaster Med*. 2018;33(4):399-405.

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THREE QUESTION INTERVIEW

Greg Scott, MBA, EMD-QI, and Chris Olola, PhD, are two authors of the research study on the Compressions Monitor Diagnostic Tool, which this brief summarizes.

1. What was an important thing you learned from conducting the study?

Chris Olola: This study enabled us to see things that callers actually do on the other end of the call that we would never have thought of in a non-visual environment! For example, the EMD and caller being out of sync—on some occasions when the EMD stopped counting 1-2-3-4, the caller also stopped compressions.

Greg Scott: There were a number of qualitative observations made during the simulations that allowed us to review and enhance specific instruction panels—like replacing the word "pillow" with a more generic wording that instructed the caller to remove anything from under/behind the patient's head when positioning the patient for CPR.

2. What impact did the study have on the MPDS?

Chris Olola: The study resulted in many internal proofs and some external Proposals for Change.

Greg Scott: Instructionally, it will mean teaching metronome use as a mandatory part of the CPR PAIs. We also created a list of a few other observations (e.g., speaker-phone instruction use where possible) that may lead to other improvements in the CPR PAIs.

3. Finally, why should EMDs care about the results of this study?

Greg Scott: In addition to the importance of using the metronome to achieve the proper compression rate and potentially save more lives with CPR, I think it gives IAED EMDs confidence in the system when they know that researchers are looking at better ways to use the protocols.

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