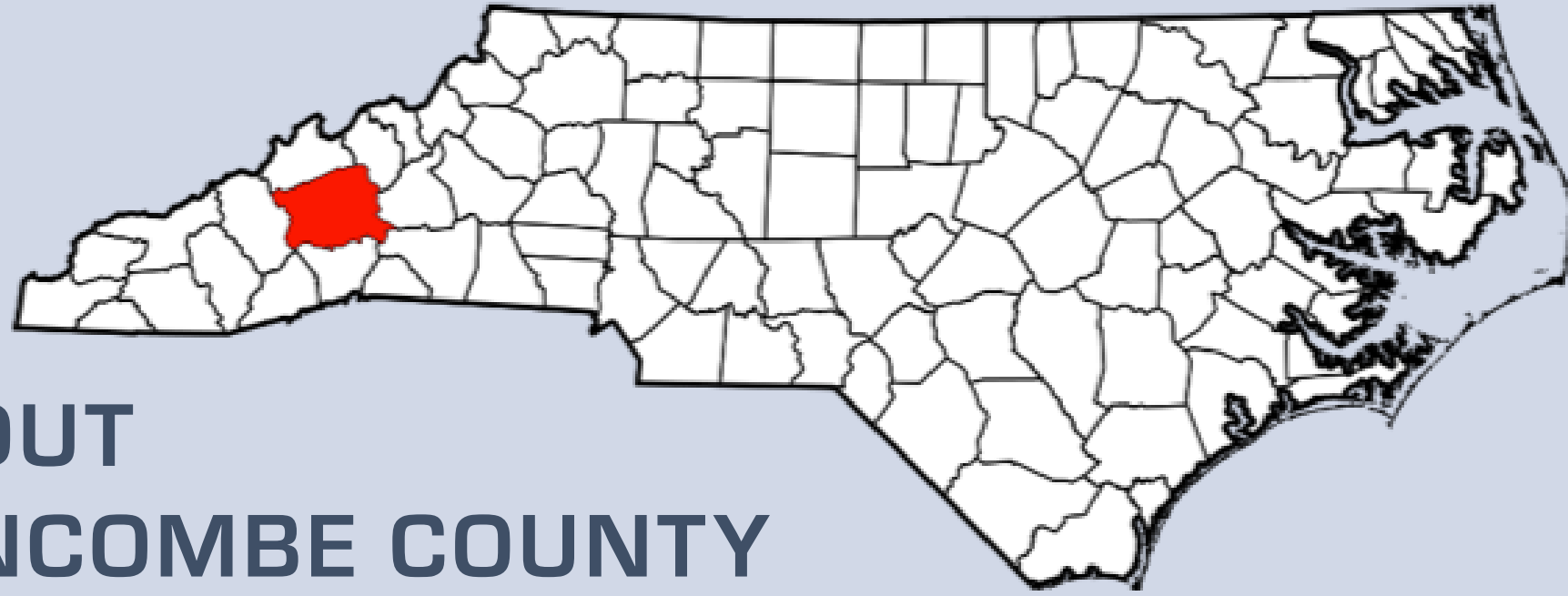




Incorporation of mCPR in an EMS system currently trained in use of High-Performance CPR

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ABOUT BUNCOMBE COUNTY

Buncombe County has a population of more than 250,000 spread over 660 square miles.

- Buncombe County EMS (BCEMS) serves as the primary advanced life support and ambulance transport 911 provider for Buncombe County, North Carolina, operating 10 transport units staffed with paramedics. The agency responds to about 29,000 calls annually.
- Six fire departments, one rescue squad and one private agency also operate ALS transport units that respond to 911 calls in the county.
- Buncombe County EMS responds with several local fire departments but geography and staffing sometimes lead to only 2 to 4 EMTs and paramedics on the scene of a cardiac arrest.

BACKGROUND

- Chest compression depth and rate have been linked to survival from cardiac arrest.
- The American Heart Association guidelines recommends maintaining a rate of at least 100 compressions per minute during resuscitation of an adult cardiac arrest victim.¹
- The Lifeline ARM was shown to provide more consistent chest compressions than manual CPR in a simulated manikin study.²

METHODS

- Buncombe County EMS began using the Defibtech Lifeline ARM automated chest compression device in 2017. The devices were provided by Defibtech LLC free of charge for an eight-month trial period.
- From March through October 2017, accelerometer data measuring chest compression rate was captured from the monitor/defibrillator.
- Accelerometer data was reviewed by BCEMS staff for all cardiac arrest cases when it was available. (Accelerometer data was captured for 64 of the 115 cardiac arrest patients during the study period).

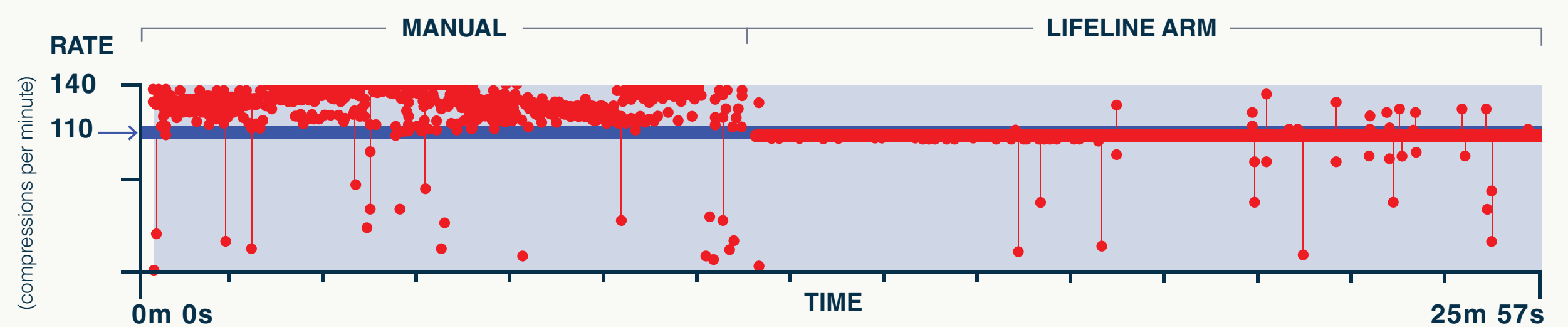


Figure 1. An accelerometer graph from one of the study patients showing manual chest compression rates and rates after application of the mCPR device.

RESULTS

- Qualitative reviews of the accelerometer graphs found that in 100% of the 64 cases where data was captured, manual CPR appeared to be faster than the target rate range of 100-120.
- Once the automated chest compression device was applied, it maintained a consistent rate within the AHA recommendations with minimal interruptions (See Figure 1).
- According to the county's CARES report, the Utstein survival rate for witnessed Vfib cardiac arrests across Buncombe County was 40% in 2017, compared to 32% in 2016.

CONCLUSIONS

- Even in EMS systems that recently implemented and trained on "pit-crew" high-performance CPR and utilize real-time chest compression feedback devices, EMTs and paramedics perform manual chest compression at inconsistent rates, often faster than recommended.
- Mechanical CPR can quickly be implemented in an EMS system.
- Mechanical CPR with the Lifeline ARM can provide chest compressions at the AHA-recommended target rate more consistently than paramedics and EMTs performing manual CPR.

REFERENCES

- American Heart Association. Web-based Integrated Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care – Part 5: Adult Basic Life Support and Cardiopulmonary Resuscitation Quality. ECCguidelines.heart.org.
- Szarpak L, Truszewski Z, Czyzewski L, Frass M, Robak O. CPR using the Lifeline ARM mechanical chest compression device: a randomized, crossover, manikin trial. The American journal of Emergency Medicine. 2017 Jan 1;35(1):96-100.