

EMS Care in Out-of-Hospital Cardiac Arrest

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INTRODUCTION

Topic Factors effecting EMS care in Out-of-Hospital Cardiac Arrest (OHCA).

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Introduction

- Each year in the United States there are over 360,000 out-of-hospital cardiac arrests¹
- Less than 10% survive
- Combined with Europe, OHCA counts for over 500,000 deaths each year
- The survival rate with favorable neurological outcomes has not increased over the last thirty years

Problem

- In 2018 and 2019, there were roughly 410 OHCA in Tuscarawas County, Ohio²
- 50 of these OHCA were witnessed arrests
- Less than 2% survived
- According to code audits, only 65% of OHCA patients in Tuscarawas County are receiving CPR within 60 seconds of EMS arrival on scene and defibrillation (when appropriate) within two minutes of arrival on scene²

Aim

Determine what factors prevent early initiation of CPR within 60 seconds of arrival.

Objectives

The design of this was to identify factors inhibiting adherence to the guidelines and attempt to identify corrective measures to increase successful implementation of the guideline at least to 90% of the time over the next three months.

1. To identify current beliefs, practices, and knowledge gaps
2. Have EMS providers participate in an evidence-based practice, guideline-specific educational module
3. To monitor provider practice change

REFERENCES

1a. American Heart Association. (2021a). A Race Against the Clock: Out-of-Hospital Cardiac Arrest. <https://www.heart.org/-/media/files/about-us/policy-research/fact-sheets/out-of-hospital-cardiac-arrest.pdf?la=en>

1b. Global Resuscitation Alliance. (2018). Improving Survival from Out-of-Hospital Cardiac Arrest: Acting on the Call. https://www.globalresuscitationalliance.org/wpcontent/pdf/acting_on_thecall.pdf

2a. Miller, K. (2019). 2018 Tuscarawas County EMS Run Report.
2b. Miller, K. (2020). 2019 Tuscarawas County EMS Run Report.

SURVEY QUESTION & CONCEPT ALIGNMENT

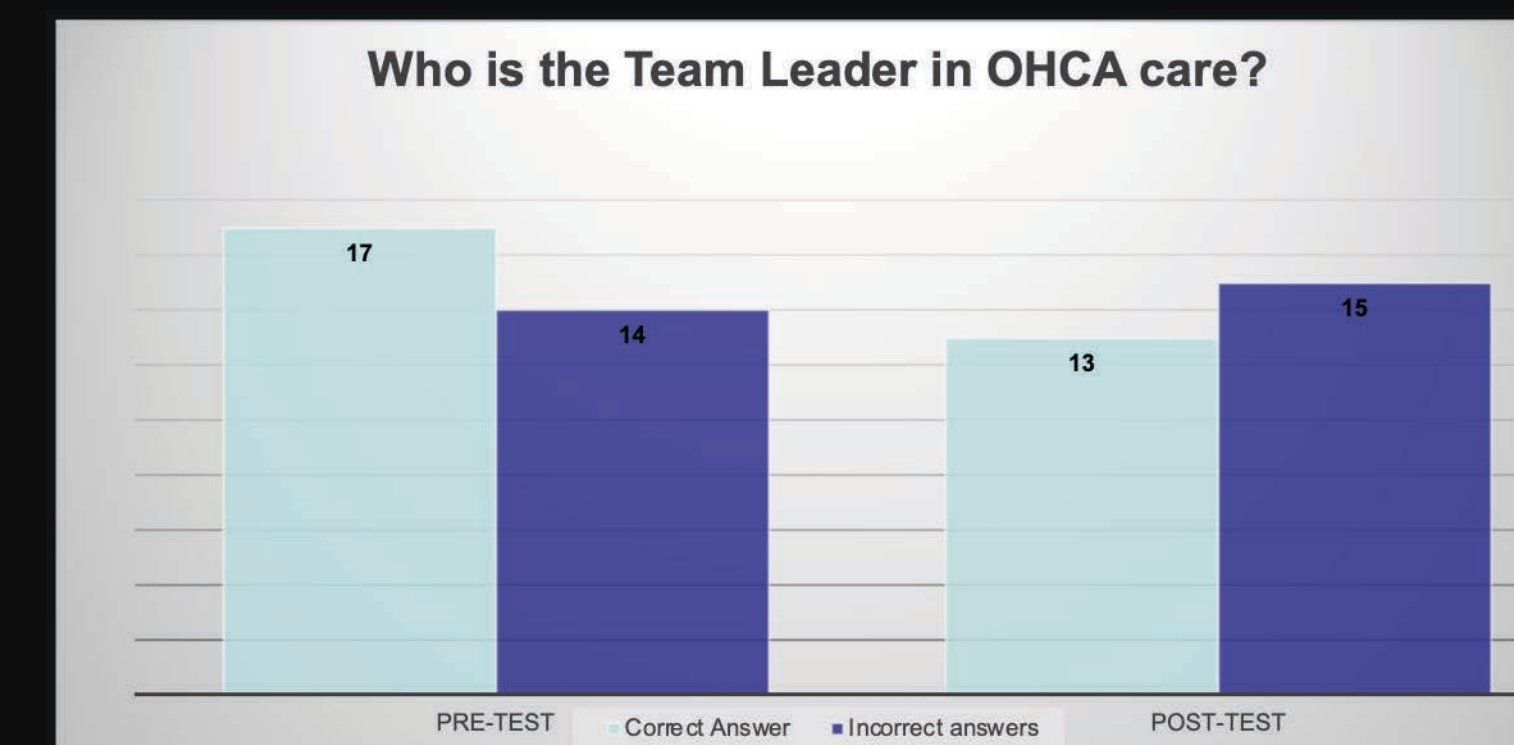
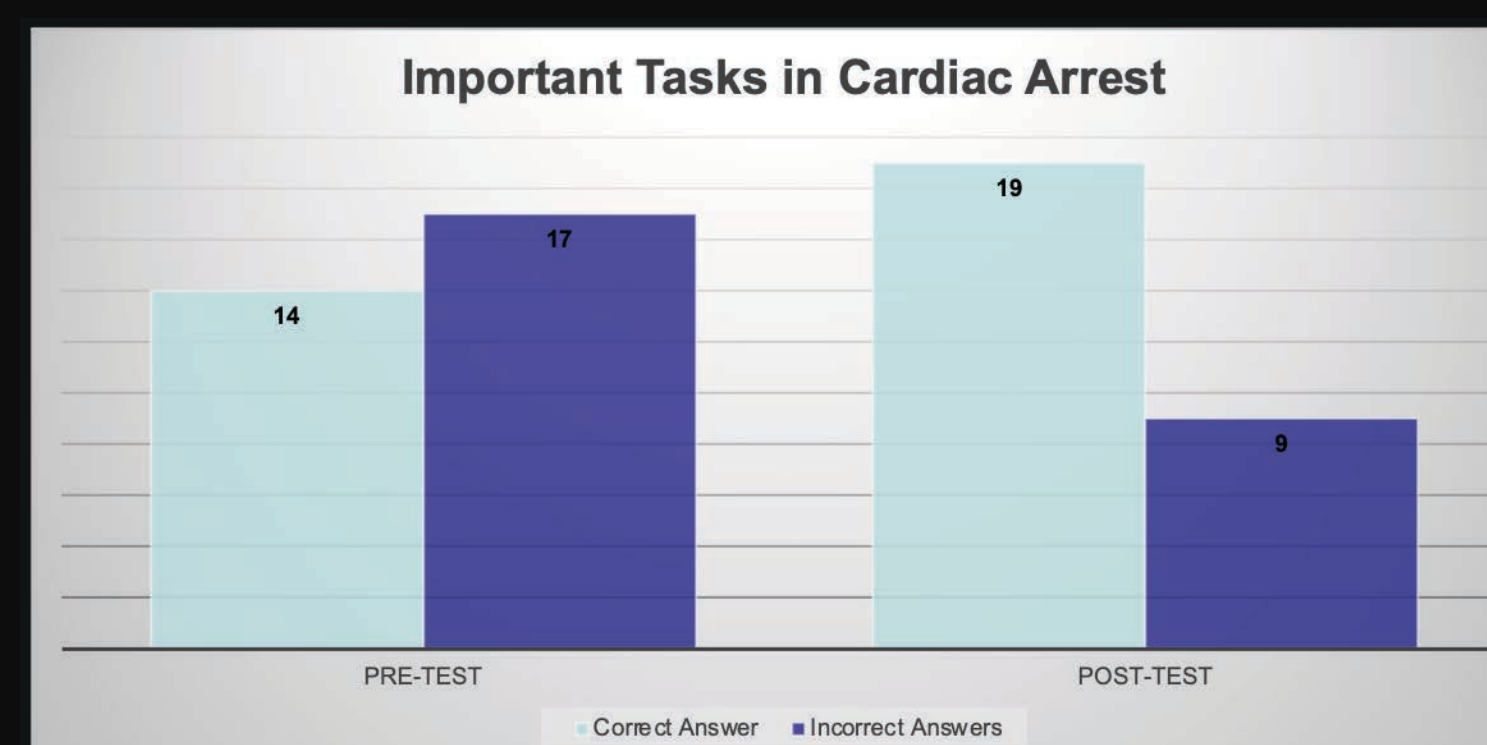
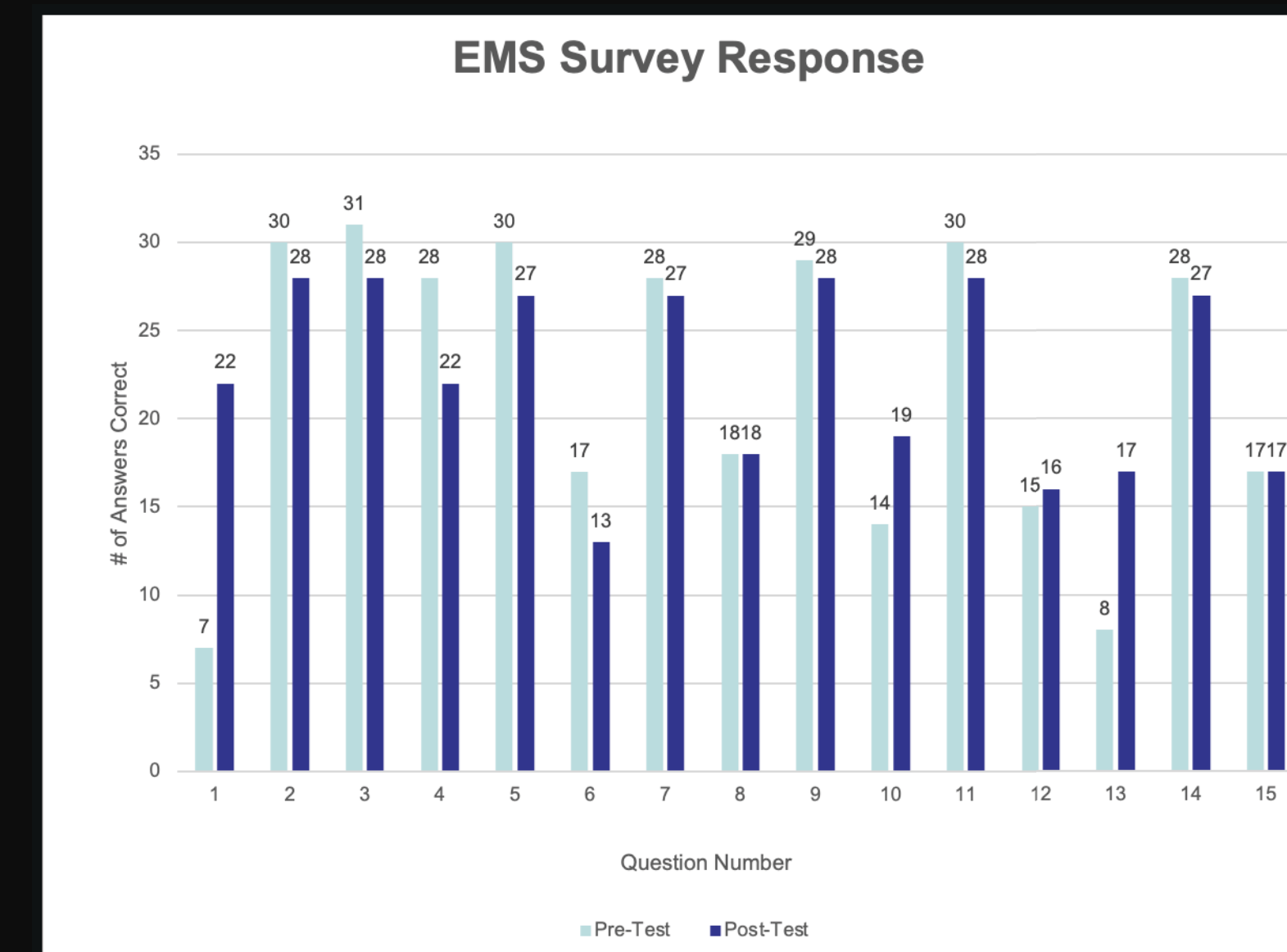
- 15 question survey was given prior to the EMS education power point presentation.
- The same survey was given a second time after the presentation to evaluate if anyone's answers had changed.
- Questions 1, 7, 9, 10, 11, 12, and 13 all align with the concept of Utstein guidelines.
- Questions 2, 9, 10, align with the concept of CPR.
- Questions 4, 5, 6, 12, 14, and 15 align with team-focused high quality CPR care.
- Question two aligns with mechanical CPR.
- Questions seven and eight align with the concept of ROSC.
- Questions 3, 9, and 10 align with the concept of defibrillation.
- All 15 questions align with the concepts of EMS and cardiac arrest.

EMS EDUCATION PRESENTATION

- National statistics
- Tuscarawas County statistics
- OHCA AHA updates
- NFPA 1710: EMS Response Standards
- OHCA factors that could affect care
- OHCA risk factors
- Tuscarawas County Population statistics
- OHCA care basics
- Dispatcher information for OHCA
- CPR and compression quality
- Three-phase model for resuscitation
- Defibrillation basics
- Primary and secondary interventions
- Airways
- Medications
- H's & T's
- Narcan in OHCA
- Mechanical CPR
- Scene care vs. intra-transport care of OHCA

RESULTS

- Due to the small volume of participants, it was difficult to see a significant change between pre and post survey responses.
- The EMS survey response graph notes how many EMS members answered each question correctly. The light blue is on the pre-survey and the purple is on the post-survey.
- One of the important questions examined the most important tasks in cardiac arrest. In this graph on bottom left, the number of correct answers (compressions and defibrillation) increased after the education.
- A very important component of team-focused care is knowing who to look for as the leader. In the graph to the bottom right, EMS responses were torn between the correct answer (lieutenant/captain of the day) and the incorrect answer (the most seasoned crew member) despite education.



METHODS

PDSA Model

P:

- Training dates and times set up with Smith Ambulance and New Philadelphia Fire Department.
- Over a month span, five 2-hour trainings were completed.
- Three trainings completed with New Philadelphia and two trainings completed with Smith Ambulance.

D:

- At each training session, a pre-presentation survey was completed by each EMS provider.
- A 30-minute power point presentation was delivered addressing factors that affect the EMS care on OHCA patients in Tuscarawas county.
- Six Hands on Scenarios were completed with the EMS providers.
- The Survey was completed again by EMS provider at the end of the training to assess if answers changed after education.

S:

- Survey answers were then organized by pre and post for each training in an excel sheet along with the most common incorrect answers to each question.
- All training sessions were then organized into one master excel sheet.

A:

- It was identified via the survey answers from EMS the factors that inhibit appropriate completion of AHA & Utstein Guidelines of CPR initiation and defibrillation within two minutes of EMS arrival on scene.
- Interventions were identified how we can improve this.
- This has created future QI projects to be implemented.

IMPLICATIONS FOR PRACTICE

- It was concluded from the QI project that there are multiple factors affecting OHCA care including modifiable and non-modifiable factors. This project helped to show that knowledge is not the only factor effecting OHCA care, but also factors such as scene time arrival, patient location, and early recognition of cardiac arrest. There were multiple factors that may result in patient death that cannot be controlled such as unknown down time, patient comorbidities, and initial cardiac rhythm.
- This project has collected information that will be utilized to help alter EMS protocols along with continuing education to help modify those factors that can be changed. Education for EMS will be offered more frequently, more hands on and real-life scenarios will be incorporated, and more live speakers to add input on the topic. New Philadelphia Fire Department will also be using the statistics found from this project to assist in negotiations for better coverage and staffing in their Union negotiations this spring.