

From Ambulance Bay to Emergency Bay: Efforts to Assess and Improve Utilization of STEMI Activation at Vidant Medical Center



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BACKGROUND

- Early recognition of ST-Elevation Myocardial Infarction (STEMI) is integral to improved outcomes in patient care.
- Studies have shown that pre-hospital activation of STEMI is associated with shorter door-to-balloon times in reperfusion therapy¹.
- Currently there remains a divide between emergency prehospital systems and the emergency room itself at Vidant Medical Center (VMC).
- Both diagnostic accuracy and adequate communication mechanisms are necessary to bridge this gap.

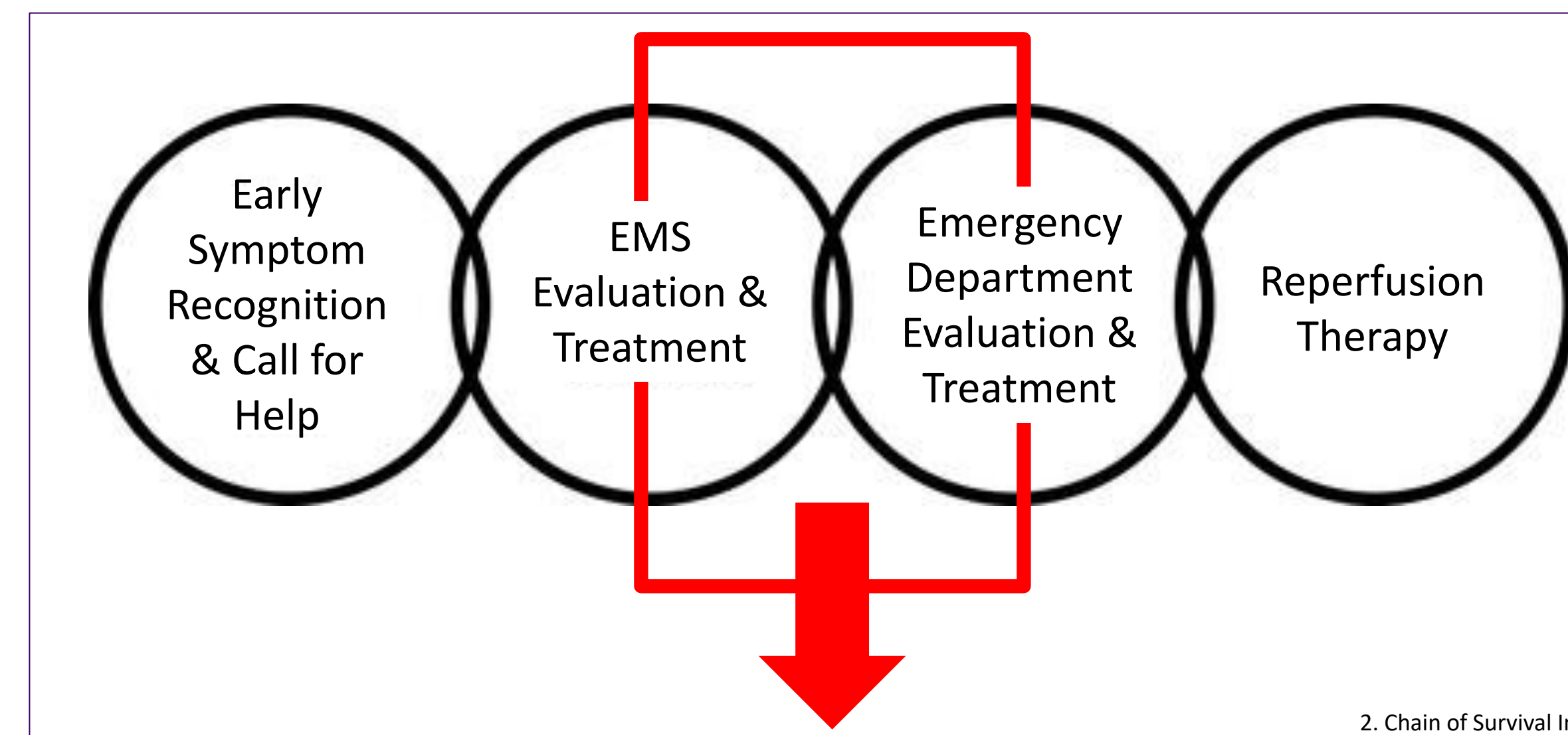
PROJECT AIM

We aim to identify the barriers involved in delayed STEMI activation within VMC and seek to address barriers to activation within the Pitt County EMS System through improving electrocardiogram (EKG) diagnostic accuracy among EMS personnel and identifying challenges within communication between the hospital and incoming ambulances.

PROJECT DESIGN/STRATEGY

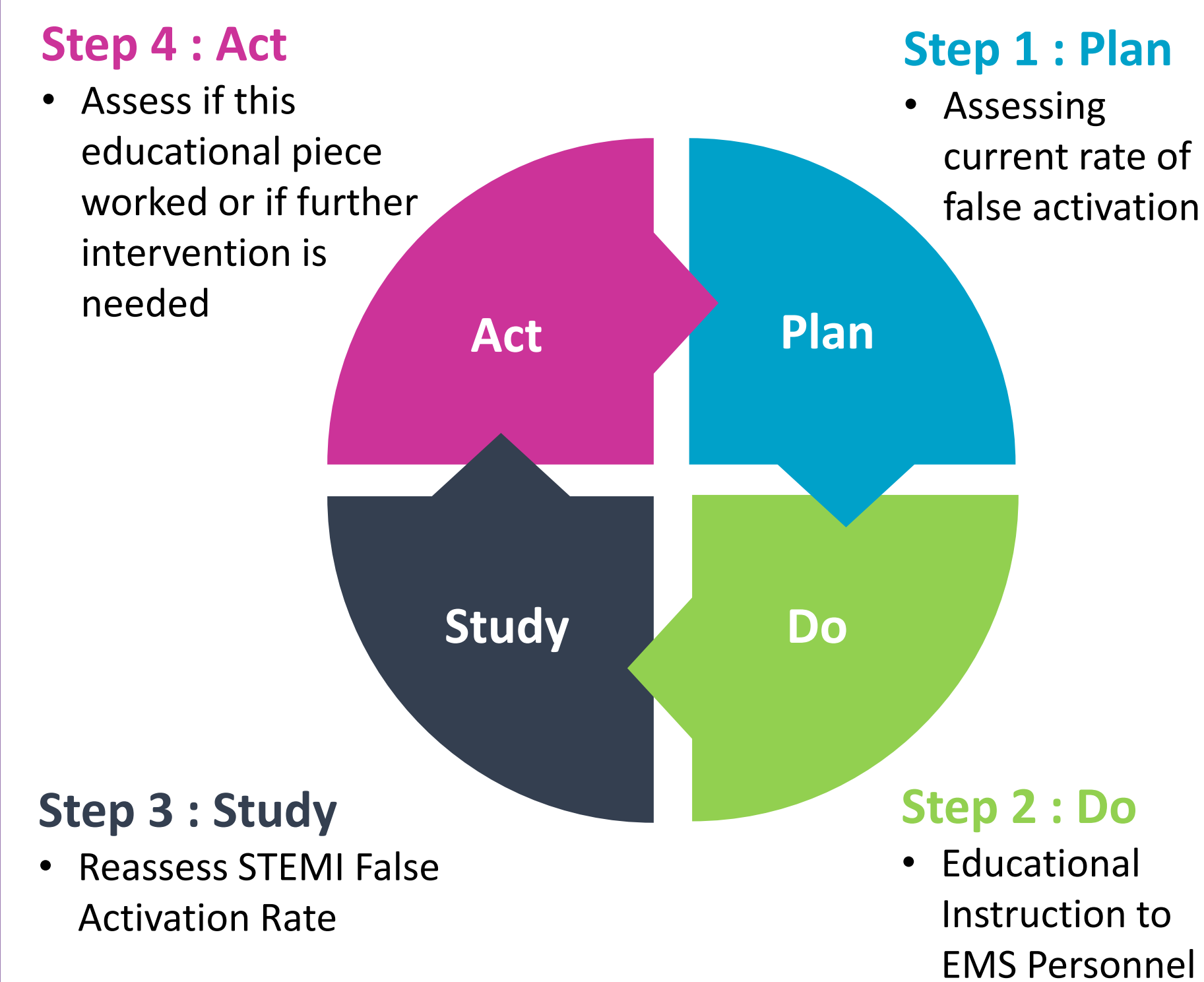
- **Location:** VMC Emergency Department & Pitt County EMS
- **Strategy:** The Plan Do Study Act method of quality improvement consisting of 2 PDSA Cycles
- **Population:** Patients diagnosed as STEMI by Pitt County EMS
- **Outcome Measure:** Reduced Door to Balloon Time
- **Balancing Measure:** Determination of False Activation rate of STEMI by Pitt County EMS
- **Balancing Measure:** Implementation of educational curriculum and false activation reassessment
- **Process Measure:** Modes of communication and mechanisms of EKG transmission between Pitt County EMS and the VMC ED were assessed

CHANGES MADE (PDSA CYCLES)

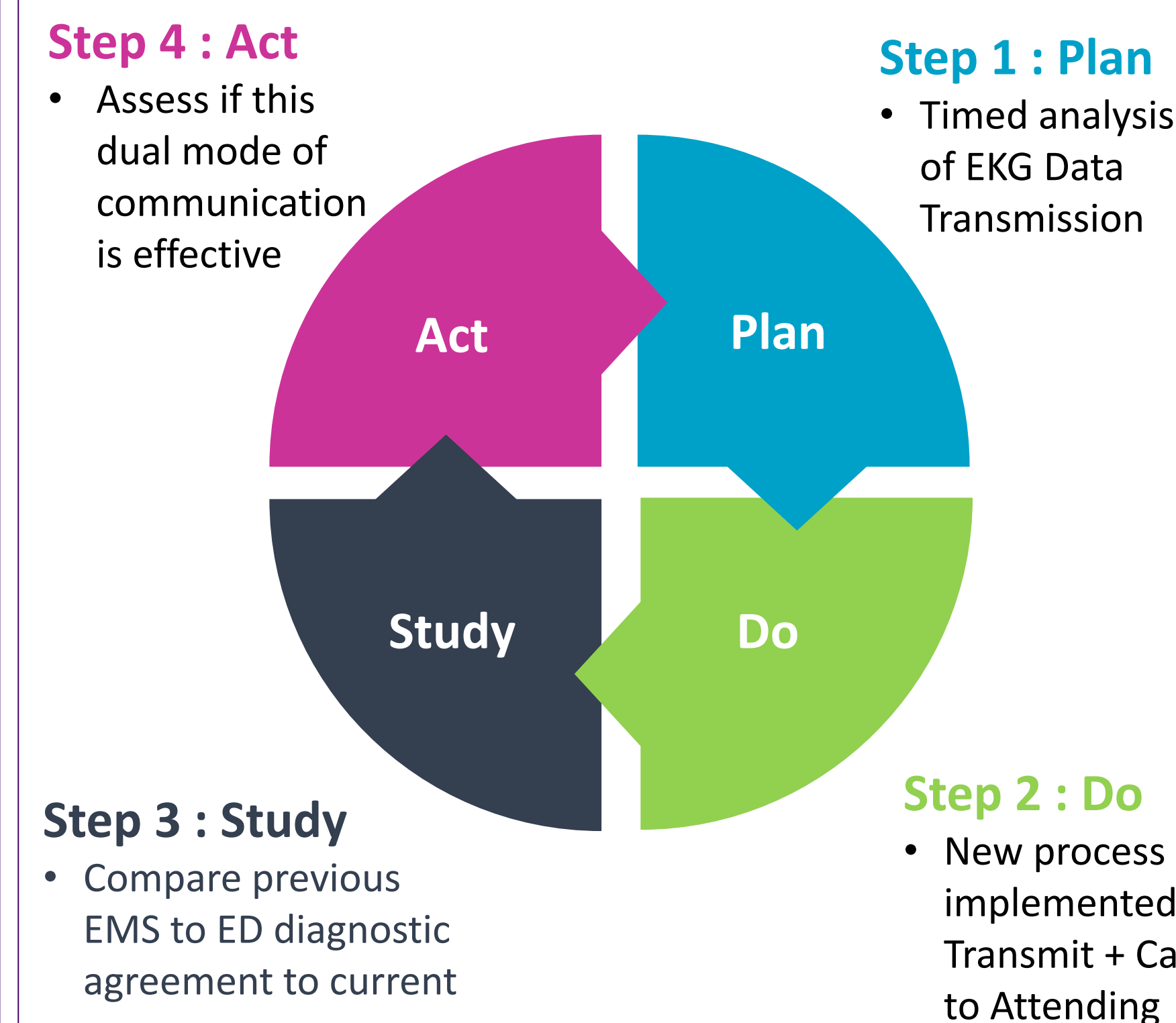


2. Chain of Survival Image

PDSA 1: STEMI False-Activation



PDSA 2: EMS to ED Communication



3. PDSA Image

RESULTS/OUTCOMES

- STEMI False Activation Analysis, December 2019 through October 2020:
 - 35 Cases Labeled as STEMI, 30 Correctly Diagnosed, 5 Falsely Activated.
 - **False Activation Rate: 14.29%**
- STEMI False Activation Analysis, June 2021 through November 2021:
 - 42 Cases Labeled as STEMI, 25 Correctly Diagnosed, 17 Falsely Activated.
 - **False Activation Rate: 40.47%**

Common Mistakes Identified:

- EKG unchanged compared to prior
- Inferior STEMI vs NSTEMI
- STEMI vs Left (and Right) Bundle Branch Block

Continuing Education:

Results for our next steps are pending. This educational piece will contain pre-and post-test evaluation for EMS personnel.

Communication Review:

Initial review of EMS to ED communication revealed a 3-minute delay between EKG submission and print-out at centralized ED printer.

LESSONS LEARNED

- Results are limited by the size of its sample; however, represent the need for further assessment of EMS and its role within the larger health system
- Initial reviews suggests mixed results regarding diagnostic accuracy for STEMI using EKGs among EMS personnel
- Pitt County EMS personnel may require reinforcing education to maintain adequate diagnostic accuracy
- Communication between EMS and ED may be a limiting factor

NEXT STEPS

Future plans for this project include:

- Implementing our educational objectives within Pitt County EMS Continuing Education courses
- Re-evaluation of false-activations following our initial educational session
- Further analyze ways to ensure streamlined communication between EMS and the ED
- Evaluate for other modes of integrated activation services, e.g., Code Stroke

ACKNOWLEDGEMENTS

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REFERENCES

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2. Image: Ornato JP. The ST-segment-elevation myocardial infarction chain of survival. *Circulation.* 2007;116(1):6-9. doi:10.1161/CIRCULATIONAHA.107.710970
3. Image: <https://www.sussexcommunity.nhs.uk/our-community-way/downloads/resources/improve/pdsa-template.pptx>

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