

OUTCOMES AND QUALITY

QUALITY IMPROVEMENT PROJECTS

Reducing STEMI Treatment Delays



A Quality Improvement Project at a Rural Community Hospital

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ABSTRACT

BACKGROUND CommonSpirit Mercy Hospital, a rural mountain hospital, consistently experienced a first medical contact-to-device time of ≥ 90 minutes for patients with ST-segment elevation myocardial infarction (STEMI), which threatened patient safety and outcomes, quality benchmarks, and achievement of Chest Pain Center Accreditation.

PROJECT RATIONALE In 2024, 60% of the FMC-to-device time for STEMI patients was ≥ 90 minutes (average: 111 minutes). In response, the quality improvement team analyzed data from the National Cardiac Data Registry's Chest Pain-MI Registry, identified gaps in prehospital STEMI activation processes, and built a multiagency collaboration.

PROJECT SUMMARY A multidisciplinary team implemented targeted outreach, education, and simulation training across regional emergency medical services agencies and internal emergency department teams. The project introduced standardized field activation protocols and the Pulsara platform for real-time communication, along with case summary follow-up and targeted improvement strategies.

TAKE-HOME MESSAGES Rural hospital settings present unique challenges to achieving guideline-recommended STEMI care. Measurable STEMI care improvement can be achieved by approaching the process with authenticity, enthusiasm, and a focus on stakeholder relationships. (JACC Case Rep. 2025;30:105658) © 2025 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Timely intervention is critical for patients experiencing ST-segment elevation myocardial infarction (STEMI) to preserve heart muscle and improve survival rates. Clinical guidelines recommend a first medical contact (FMC)-to-device time of ≤ 90 minutes to restore blood flow and minimize irreversible myocardial damage.¹ Every minute of delay increases the risk of complications such as heart failure, arrhythmias, and death, making rapid diagnosis, transfer, and reperfusion a top priority.² Evidence consistently shows that shorter treatment times are directly associated with better

TAKE-HOME MESSAGES

- Implementing change across a large network of stakeholders brings both real and perceived challenges.
- By approaching the process with authenticity, enthusiasm, and a focus on relationships alongside data, we achieved meaningful improvements in STEMI treatment times.
- By using holistic strategy to address care process gaps, we improved both outcomes and communication across care teams.

From the Cardiac Catheterization Laboratory, CommonSpirit Mercy Hospital, Durango, Colorado, USA.

The author attests they are in compliance with human studies committees and animal welfare regulations of the author's institution and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).

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**ABBREVIATIONS
AND ACRONYMS**

ED = emergency department
EMS = emergency medical services
FMC = first medical contact
MI = myocardial infarction
STEMI = ST-segment elevation myocardial infarction

patient outcomes, underscoring the urgency for coordinated, efficient care pathways.³

Rural hospital settings present unique challenges to achieving guideline-recommended treatment times. Geographic isolation, long transport distances, and fewer specialized staff often contribute to delays between symptom onset and reperfusion treatment.⁴ These barriers necessitate innovative solutions, such as prehospital

activation of catheterization laboratories and streamlined transfer protocols to regional centers capable of percutaneous coronary intervention. Rural hospitals can improve STEMI care delivery by focusing on system-wide coordination and overcoming logistical constraints, thereby reducing mortality and improving recovery for patients in underserved areas.

PROJECT RATIONALE

CommonSpirit Mercy Hospital in Durango, Colorado, is the largest and most technologically advanced rural mountain hospital serving the diverse population of the Four Corners region of the U.S. (southwestern Colorado, northwestern New Mexico, northeastern Arizona, and southeastern Utah). Geographical constraints, weather, and transfers from more rural hospitals not capable of percutaneous coronary intervention extend STEMI patient transfer and

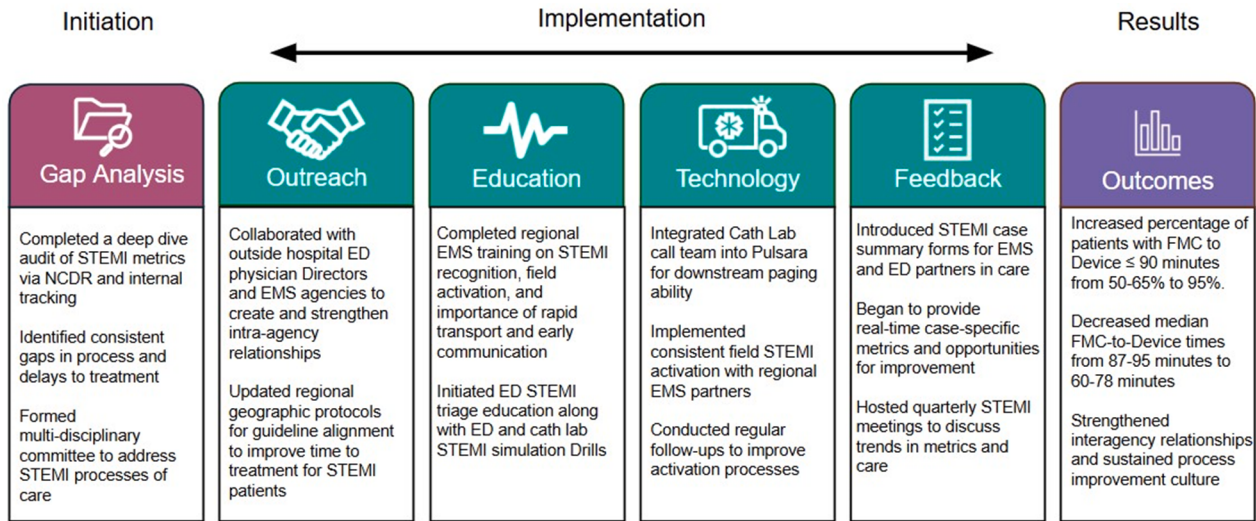
treatment times. In 2024, the FMC-to-device time was ≥ 90 minutes for 60% of STEMI patients on average. In addition, no prehospital STEMI activation process was in place.

The aim of this quality improvement project was to improve patient outcomes and meet requirements for Chest Pain Center Accreditation by thoroughly analyzing the STEMI data in the National Cardiovascular Data Registry's Chest Pain-MI Registry (CPMI) database, identifying gaps in response processes, forming relationships with multiple health care agencies, and shortening FMC-to-device times. The goal was to decrease the time between a patient's first medical contact via emergency medical services (EMS) or emergency department (ED) walk-in to the time of coronary artery reperfusion in the cardiac catheterization laboratory.

PROJECT DESCRIPTION

Analysis of STEMI data in the CPMI database showed that on average, 60% of STEMI patients' FMC-to-device time was ≥ 90 minutes. A multidisciplinary committee was formed to identify process gaps and distinguish nonmodifiable components (geography, weather, availability of flight crews) and modifiable components (time between STEMI recognition and STEMI team activation, triage time, time between STEMI team activation and patient in room). The cardiovascular program manager acted as the project

VISUAL SUMMARY Timeline of Project Initiation, Implementation, and Results



Reducing FMC-to-Device Times in Rural STEMI Care – Project Summary

coordinator. Stakeholder team members were the interventional cardiologists; cardiac catheterization laboratory staff/call team; ED physicians, nurses, and triage staff; ED and EMS physician directors from regional STEMI referral centers; and 5 regional EMS service teams (paramedics and emergency medical technicians). The team developed a multifaceted quality improvement plan to address gaps in processes. Several coordinated interventions were implemented to create sustainable change to improve STEMI treatment in our rural community.

The team partnered with 2 STEMI referral centers to refine treatment protocols. Working collaboratively with referral center ED physician directors, EMS physician directors, and EMS teams, the team revised geographic STEMI treatment and activation protocols to clearly reflect American Heart Association guideline-directed care. Revised protocols now address geographical constraints to transport and use geographical landmarks to guide patient transport to the most appropriate institution.

Outreach visits including education sessions were conducted with regional EMS teams. Educational content included acute coronary syndrome, electrocardiogram interpretation, signs and symptoms of STEMI, early STEMI recognition, STEMI field activation, and rapid transport. EMS-specific STEMI metrics were shared during these visits along with actionable items for improvement. Additionally, collaborative education and simulation was performed with our internal ED team to improve early STEMI recognition and team activation for walk-in patients. Education was provided to registered nurses and triage teams at skills fairs and triage nurse training boot camps. Interprofessional STEMI and cardiogenic shock drills were conducted in the ED for the ED nurses and physicians, the flight team, and the cardiac catheterization laboratory.

The Pulsara paging platform—a real-time communication and alerting platform that streamlines care coordination by connecting health care teams through secure, time-stamped notifications and messaging—was implemented in collaboration with community EMS partners to encourage field activation of STEMI protocols. Implementation of the paging system was conducted in conjunction with EMS outreach and education, with emphasis placed on early STEMI recognition and field activation. STEMI patients created within Pulsara alert the hospital's ED physician on duty as well as the interventional cardiologist on call. The HIPAA (Health Insurance Portability and Accountability Act)-compliant electrocardiogram and accompanying clinical information are reviewed by the physicians,

and a determination of plan of care is made within 2 minutes. The cardiac catheterization laboratory on-call team is activated directly within the Pulsara application, and the team can view patient information in real time to inform procedural preparation and care.

The catheterization laboratory medical director and cardiovascular program manager implemented a standardized STEMI case summary follow-up form highlighting case timing metrics (see [Figure 1](#)) for ED and EMS partners. When a case does not meet the FMC-to-device time of ≤ 90 minutes, objective, actionable feedback suggestions are provided to mitigate issues or obstacles for future cases. Forms are emailed to affiliated physicians and agencies within 2 business days, providing data-driven feedback for each case and thanking community partners for their work and dedication to improving STEMI care in the community.

PROJECT DELIVERABLES

Project deliverables included a standardized field STEMI activation protocol for EMS agencies, STEMI education for regional EMS providers, STEMI activation drills, and the ongoing use of the STEMI case summary feedback form ([Figure 1](#)) to share case outcomes and metrics with EMS and ED partners.

PROJECT OUTCOME, IMPACT, AND FUTURE DIRECTIONS/NEXT STEPS

The percentage of patients with an FMC-to-device time of ≤ 90 minutes (CPMI metric 7652) increased, and the median FMC-to-device time (CPMI metric: 13443) decreased after implementation of a multifaceted, interagency process improvement project that included standardized field activation processes for STEMI patients.

The percentage of patients with an FMC-to-device time of ≤ 90 minutes ranged from 50% to 66.7% in calendar year 2024 ([Figure 2](#)). After project implementation in February 2025, 95% of patients experienced an FMC-to-device time of ≤ 90 minutes. The median FMC-to-device time ranged from 87 to 95 minutes in calendar year 2024. The median time had decreased by February 2025 and ranged from 60 to 78 minutes ([Figure 3](#)).

DISCUSSION

The success of this quality improvement initiative illustrates that meaningful reductions in STEMI treatment times can be achieved even in rural, geographically challenging settings when a

FIGURE 1 STEMI Case Summary Form

CommonSpirit

Mercy Hospital

STEMI Case Summary

Date:

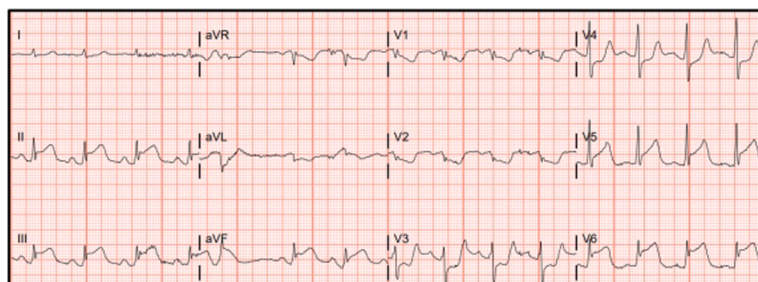
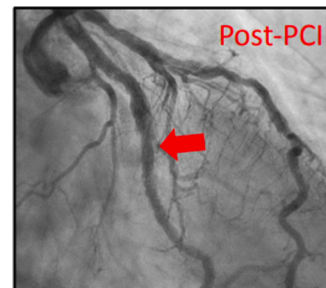
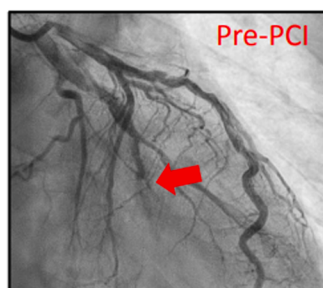
70 y/o male

Chief complaint: Chest Pain

Interval	Time	Notes
First Medical Contact	08:38	UP
STEMI EKG	08:45	
STEMI Activation	08:48	
ED Arrival Time	08:58	
Patient Arrival to CCL	09:11	
Arterial Access	09:20	Radial
First Balloon/Device Time	09:26	Balloon

FMC-to-Device	48 min
EKG to Cath Lab Activation	3 min
ED Duration	12 min
Cath Lab Door to Device	15 min

Please contact us with follow up questions



Summary of Events: 70 y/o male patient with 55 year history of smoking presents to EMS with 3 hours of chest pain associated with left side numbness and emesis. EMS EKG positive for inferolateral STEMI and activation was completed from the field. Patient received 324mg ASA en route and 180mg brilinta and 4000 units IV heparin in ED before being transferred to cath lab for emergent PCI.

Cath Lab Findings: 100% occlusion to mid circumflex treated with mechanical thrombectomy assisted PCI and overlapping stents. The patient experienced a variety of reperfusion arrhythmias requiring amiodarone and transient blood pressure support. Admitted to the ICU in stable condition.

Feedback:

- Goal time of ≤ 90 minutes for First Medical Contact to device was met. Great job Upper Pine for the fast STEMI activation and to our ED for rapid assessment and patient prep!

Thank you to everyone involved in the care of this patient!

A case summary form for all STEMI patients was created that covered prehospital and preprocedure efficiency metrics as well as catheterization laboratory findings. This is emailed to involved physicians and agencies within 2 business days to provide timely, objective patient follow-up and feedback on STEMI processes. STEMI = ST-segment elevation myocardial infarction.

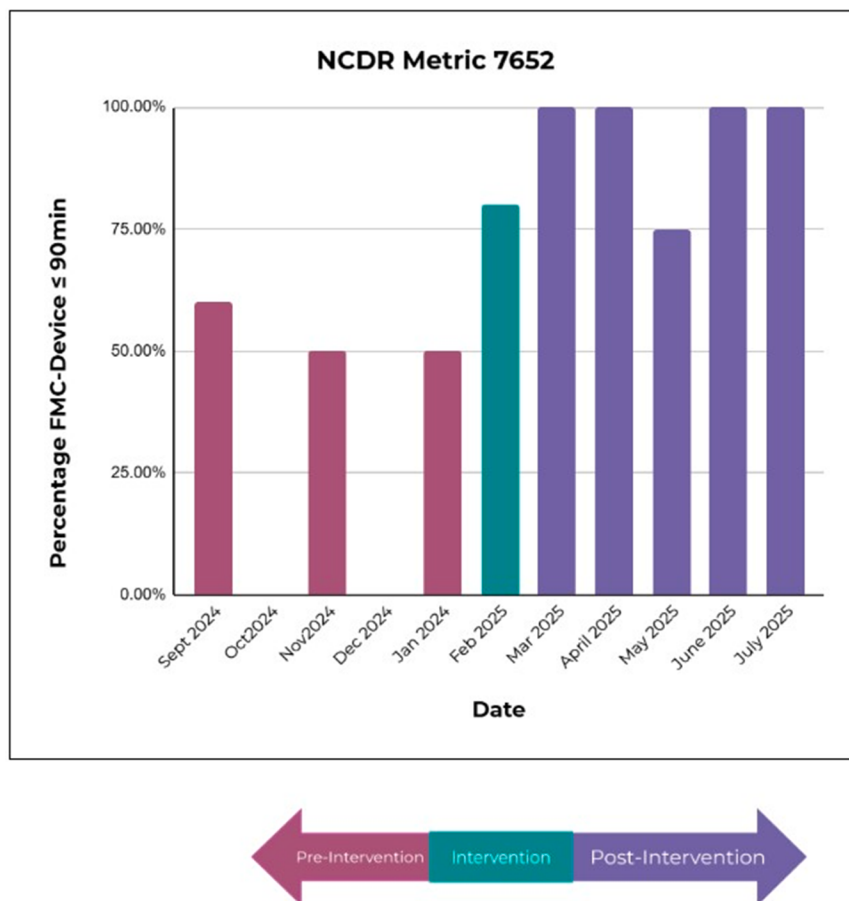
deliberate, relationship-centered, and multidisciplinary approach is taken. Rural facilities face unique obstacles to achieving guideline-directed FMC-to-device times of ≤ 90 minutes. Obstacles include long transport distances, variable weather conditions, limited local resources, and dependence on outside hospital systems for transfers. These barriers can create a sense of inevitability around delays; however, our project demonstrates that focused collaboration, standardized processes, and targeted outreach can overcome many modifiable delays and improve patient care processes.

Central to the success of this initiative was the intentional alignment of diverse stakeholders—regional EMS teams, ED staff, interventional cardiologists, catheterization laboratory team members,

and leadership from both referring and receiving hospitals—around a shared goal. Early recognition of STEMI, particularly in the prehospital setting, was identified as a critical lever for change. Standardized field activation protocols and the introduction of the Pulsara paging system facilitated rapid, clear, and consistent communication between teams. Education and simulation-based training, tailored to the realities of both prehospital and ED settings, reinforced best practices while building confidence among providers. These steps not only streamlined processes but also fostered trust, mutual respect, and a shared sense of accountability across agencies.

An equally important aspect of the project was the feedback loop created through the STEMI case summary form. Providing timely, case-specific

FIGURE 2 NCDR Chest Pain-MI Registry Metric 7652: Percentage of Patients With FMC-to-Device Time ≤ 90 Minutes



Visual representation by month of the percentage of STEMI patients who achieved an FMC-to-device time of ≤ 90 minutes before and after project implementation. FMC = first medical contact; MI = myocardial infarction; NCDR = National Cardiac Data Registry; STEMI = ST-segment elevation myocardial infarction.

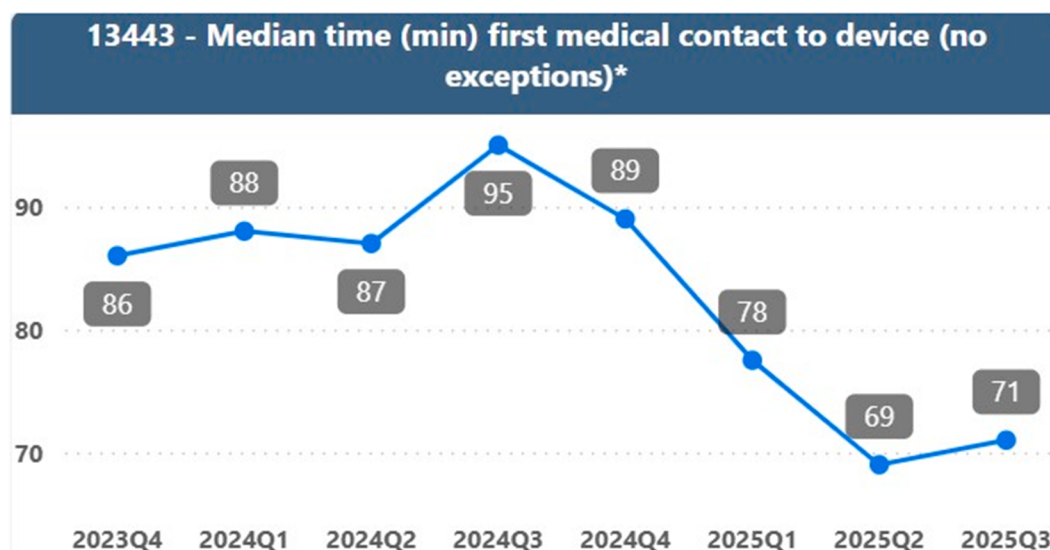
performance data and recognition for successes helped sustain engagement and motivated ongoing improvement. This relational, transparent approach strengthened interagency partnerships and broke down longstanding silos, ultimately allowing all involved to function as a unified care team.

The outcomes of this quality improvement project demonstrate that strategic, collaborative change can yield measurable benefits. The project's influence goes beyond metrics, demonstrably establishing a culture of cooperation, accountability, and continuous improvement. The lessons learned reinforce that in complex systems, particularly in rural

health care, achieving success depends not only on protocols and data but also on relationships, communication, and shared commitment to patient-centered care.

CONCLUSIONS

This quality improvement project not only improved treatment times for STEMI patients but also bridged longstanding gaps in collaboration with regional EMS services and referral hospitals, helping the organization meet the requirements for Chest Pain Center Accreditation. A diverse, multidepartmental,

FIGURE 3 NCDR Chest Pain-MI Registry Metric 13443: Median FMC-to-Device Time

Visual representation by quarter of median FMC-to-device times. Abbreviations as in Figure 2.

multidisciplinary, and interagency network of stakeholders was united into a single, cohesive care team through outreach, education, process improvements, and consistent feedback. The intentional alignment of diverse stakeholders overcame historical barriers and delivered measurable, sustainable benefits for the unique community we serve. The team remains committed to strengthening stakeholder partnerships around the shared goal of improving cardiovascular emergency care in our rural community.

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KEY WORDS activation, collaboration, leadership, Pulsara