

# Reducing Door-to-EKG time in the Emergency Department

Reality

## Background

### The practice disparity

A significant proportion of ACS patients do not receive an EKG within the ACC/AHA 10 minute benchmark, a life threatening and preventable gap in emergency care.

### Setting

Rural northern California ED, geographically isolated  $\geq 2$  hours from higher-level care. County median income  $\sim$ \$66,780; population includes 19.6% Hispanic, 6.2% American Indian/Alaska Native, and non-English-speaking residents (DataUSA, 2023).

### Why it matters

Every 10 min of EKG delay=irreversible myocardial tissue loss. STEMI mortality doubles without timely acquisition (Yiadam et al., 2024).

## Importance of Issue

37.9%

of STEMI patients missed 10-min EKG window (Yiadam et al., 2022)

10.2% vs 5.0%

1-week mortality: delayed vs. timely EKG (Yiadam et al., 2024)

### Populations disproportionately harmed

Women • Black patients • Non-english speakers • Diabetic patients • Atypical presenters

ED delay time is an independent predictor of 1 year all cause mortality in STEMI patients (Söner et al., 2025).

## Framework

### Iowa model of Evidenced based practice

- Identify triggering issue**  
Problem-focused trigger: 37.9% of STEMI patients miss the 10-min EKG window (Yiadam et al., 2022); mortality doubles with delayed EKG.
- Form a team and state the question**  
Team: triage RN, ED physician, nurse manager, QI specialist. PICOT: Does a standardized triage EKG protocol reduce D2E times vs. current practice?
- Assemble and appraise evidence**  
Synthesized 8 peer-reviewed sources (Level II–III). Bundled protocols (Davenport et al., 2025; Nfor et al., 2019), atypical presentation education (Scully et al., 2024), and ACC/AHA guidelines (Rao et al., 2025).
- Design and pilot the practice change**  
Three-level intervention: culturally tailored patient education, nurse-driven triage EKG protocol with dedicated equipment, and formal institutional D2E quality metric.

Theoretical

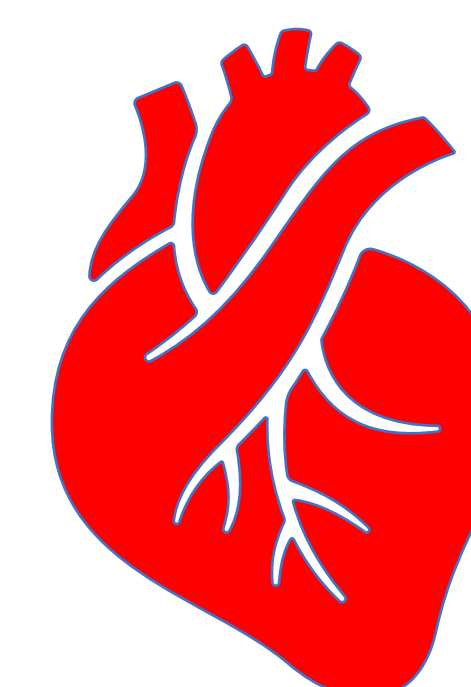
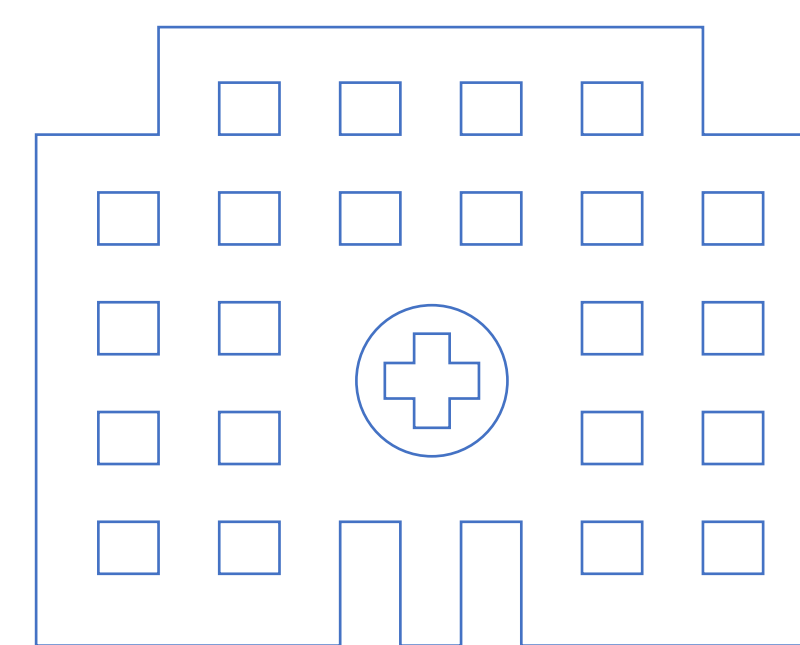
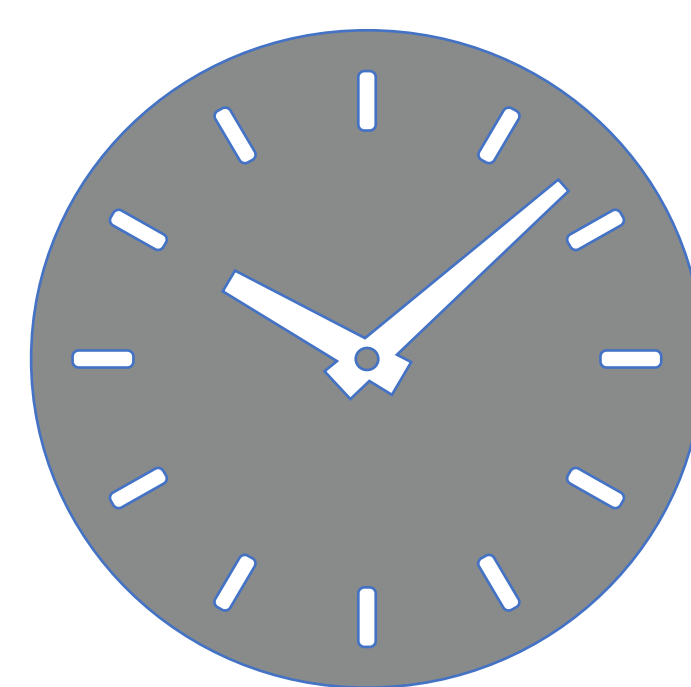
## Key Concepts & Outcomes

### Overall Outcome Goal

Achieve equitable, timely EKG acquisition ( $\leq 10$  minutes) for all ACS patients in this rural ED, reducing preventable mortality and eliminating demographic disparities in door-to-EKG (D2E) performance.

### SMART Objectives

- Individual:** By Dec 2026,  $\geq 75\%$  of education participants will correctly identify 3+ atypical ACS symptoms on post-test.
- Department:** By Jun 2026,  $\geq 90\%$  of ACS patients achieve D2E  $\leq 10$  minutes per EHR timestamps.
- Policy:** By Sep 2026, formal D2E quality metric adopted with monthly stratified reports to leadership and documented QI response plan.



## Interventions & Solutions

### Individual: Culturally Tailored ACS Education

Develop multilingual, culturally grounded education materials covering full ACS symptom spectrum (dyspnea, jaw pain, nausea, diaphoresis, epigastric pain, fatigue). Partner with tribal health programs and Spanish-speaking liaisons for co-creation and distribution at clinics, waiting rooms, and community events. Reduces prehospital delays from atypical presentation bias (Scully et al., 2024; Rao et al., 2025).

### Department: Standardized Triage EKG Protocol

Written protocol mandating EKG  $\leq 10$  min for any ACS symptom. Dedicated EKG machine at triage. Role clarity: triage nurse owns EKG acquisition. Brief nursing education on atypical presentations and time-stamping. Bundled interventions reduced median D2E time by 32% and EKG interpretation time by 74% over 12 months (Davenport et al., 2025; Nfor et al., 2019).

### Policy: Formal D2E Quality Metric & Accountability

Institutionalize D2E as a tracked patient safety metric: real-time EHR capture, monthly reports stratified by sex, race, ethnicity, language, and chief complaint. QI response plan activated when  $< 90\%$  compliance. Bi-weekly quality reports enable leadership to identify and address delay patterns before entrenchment (Davenport et al., 2025; Rao et al., 2025).

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## Key Players

### Patient Population

Rural northern CA ED patients with ACS symptoms — disproportionately including women, older adults, Hispanic, American Indian/Alaska Native, non-English speakers, and diabetic patients.

### Clinical Team

Triage RN (primary driver) • Emergency physician • ED nurse manager • Quality improvement specialist

### Community Partners

Community health workers • Tribal health programs • Spanish-speaking liaisons • Primary care clinics

## Evaluation

### Process Evaluations

- Track # of community education sessions ( $\geq 4$ /month), attendance, and materials distributed
- Monitor protocol adherence rate: % of eligible patients receiving triage EKG per protocol (target  $\geq 95\%$ )
- Audit EHR timestamp completion (target: 100%) and confirm dedicated EKG machine availability  $\geq 95\%$  of shifts
- Confirm formal policy document adopted; monthly D2E reports generated and presented (target: 100% of months)

### Impact Evaluations

- Pre/post ACS symptom knowledge test, target  $\geq 75\%$  correct post-test (Scully et al., 2024)
- D2E time (EHR timestamps), criterion standard measure per Yiadam et al. (2022) and Davenport et al. (2025); target  $\geq 90\% \leq 10$  min
- Stratified D2E data by sex, race/ethnicity, language, chief complaint, target: elimination of statistically significant disparity
- 12-month STEMI mortality audit comparing in-hospital and 30-day mortality rates pre- vs. post-implementation (Söner et al., 2025)

### Outcome Measures

Longitudinal D2E monitoring (monthly, 12 months) • Demographic disparity analysis (quarterly) • STEMI mortality reduction

## References

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