

# ***Reduction of Door-to-Balloon Time to 90 Minutes or Fewer for STEMI Patients at Rapid City Regional Hospital (RCRH)***



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# About Rapid City Regional Hospital

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- Located in Rapid City, South Dakota.
- Nonprofit acute care hospital with 326 beds.
- Serves a geographically widespread area (radius of 250 miles).
- Has a cancer care facility and an inpatient rehab facility.
- Provides medical training for family practice medicine.



# The Project Team

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- Clinical Quality Coordinator (Leader)
- Physicians
- Department Directors (including Emergency Department)
- Hospital Vice President
- Director, Helicopter Transport Service

# The Problem

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- Rapid City Regional Hospital was not meeting the national standard (reduced from 120 to 90 minutes in 2006) for timely intervention and reperfusion for patients with **ST Segment Elevation Myocardial Infarction (STEMI)**.
- Evidence shows a patient experiencing a STEMI needs balloon angioplasty within 90 minutes of arrival to the emergency department or administration of TnKase, a clot-dissolving drug, within 30 minutes of arrival to open the artery and decrease mortality and morbidity. The prompt actions may be the difference between life and death for the patient.
- Direct percutaneous intervention (PCI) within 90 minutes is the preferred method of reperfusion.

# Project Goals

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- Key metric for STEMI patients: “door-to-balloon time.”
  - Average door-to-balloon time at RCRH for the first six months of 2006: 132 minutes.
- Goal: Decrease door-to-balloon time for STEMI patients to 90 minutes (national standard) or fewer.

# Root Cause Analysis

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- Initial data collection and analysis indicated time from arrival at the emergency department door to restoration of cardiac arterial blood flow with balloon angioplasty was considerably longer than desired and recommended for good patient outcomes.
- A number of elements were identified as root causes of delays for this door-to-balloon process, including:
  - Inconsistent application of protocols for STEMI.
  - Lack of order sets and group-page alerts for STEMI.
  - Capability for EKG field transmission (allows calling the STEMI alert from the field).
  - Perceived lack of need for improvement/change.



# Addressing Root Causes

ISSUE	TOOLS USED	"SOLUTION"	PERSONNEL	TIME REQUIRED	COST	OBSTACLES
Lack of formal mechanism for establishing STEMI alert	Brainstorming Literature search	Developed and implemented order sets for STEMI Established Group Page Alerts for STEMI	Personnel representing ED, cardiology, cath lab, quality and communications department	4 months	Minimal (printing of order sets)	Process of introducing new order sets – resistance to change
Inconsistent application of protocols for STEMI	Brainstorming Literature search Use of experts	ED and cardiology physician champions involved in educating facilities and personnel Transparent individual physician peer review process Reward and recognition program Placement of synchronized atomic clocks	Personnel representing ED, cardiology, cath lab, quality	Clocks - 1 month Transparent review process – 5 months	Clocks – approx \$1,000 Reward and recognition = approx \$1,500	Resistance to change Inability to accurately and consistently track STEMI times (atomic clocks needed)
Inconsistent capability for transmission of field data to ED	Brainstorming Literature search	Emplacement of transmission equipment with the ambulance crews	Personnel representing ED, cardiology, cath lab, quality, EMTs	7 months	Equipment = nominal cost for printer (approx \$300) (transmissions are done via Bluetooth and broadband access)	Cost Resistance to change ID specific educational needs
Lack of perceived need for improvement	Brainstorming Literature search Use of experts	Transparent physician peer review process Reward and recognition program ED and cardiology physician champions involved in educating facilities and personnel	Personnel representing ED, cardiology, cath lab, quality	5 months	Reward and recognition (see above)	Resistance to change ID specific educational needs

# Return on Investment

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- Total cost of equipment and supplies  $\approx$  \$3,000
- RCRH's average "door-to-balloon" time fell from 132 minutes in 2006 to 63 minutes for the first four months of 2009, a **52 percent decrease**. This put RCRH's average door-to-balloon time **30 percent below the national standard of 90 minutes**.
- Data from July 2005 through June 2008 indicated that RCRH showed a readmission rate for heart attack patients that was **20 percent lower than the national benchmark** (source: [www.hospitalcompare.hhs.gov](http://www.hospitalcompare.hhs.gov)).



# Monitoring and Evaluating Over Time

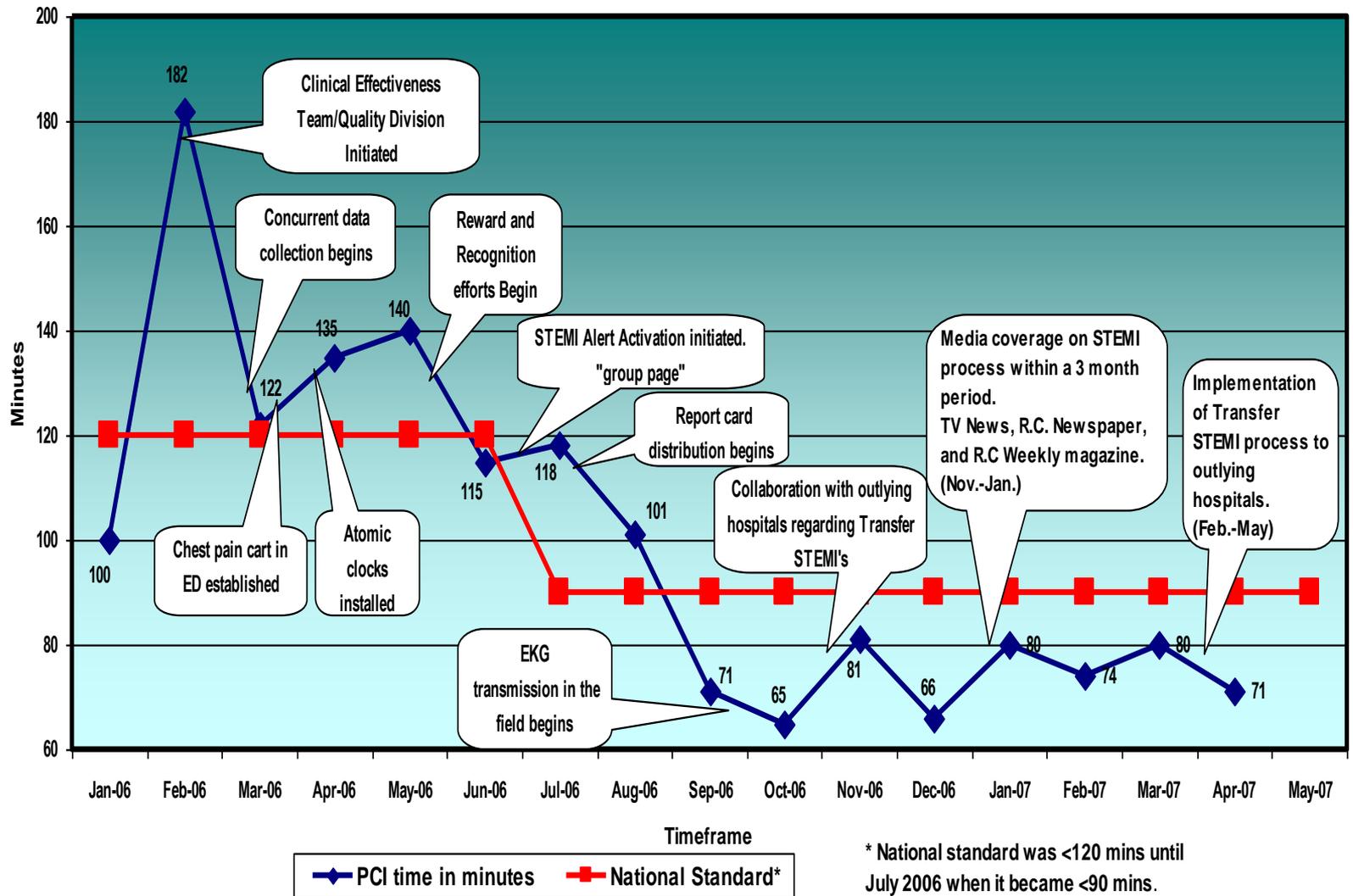
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- Data are reported for each patient and compiled into monthly summaries.
- A report is sent to all key project participants, keeping them informed of the current status, and is reviewed in the monthly cardiology/emergency physicians staff meetings.
- As indicated previously, the project has been very successful, resulting in a 52 percent reduction in door-to-balloon time for STEMI patients presenting themselves to the emergency department at RCRH.
- RCRH's current average door-to-balloon time of 63 minutes is 30 percent below the national standard of 90 minutes.



# Efforts to Improve Door-to-Balloon Time for STEMI Patients

## Efforts to Improve Time to Percutaneous Coronary Intervention (PCI) for ST Elevated Myocardial Infarction (STEMI)



# For More Information

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- Learn more about Rapid City Regional Hospital:  
[www.regionalhealth.com](http://www.regionalhealth.com).
- More case study presentations are available from the ASQ Healthcare Division:  
[www.asq.org/health/quality-information/library](http://www.asq.org/health/quality-information/library).
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