Surviving MI

AN ACC QUALITY INITIATIVE

Monday, April 24, 2017

Quality Improvement for Institutions

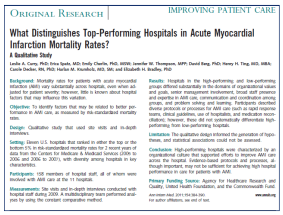
How this webinar is organized

Time	Topic
2:00pm	Welcome and Introductions
2:10pm -2:50pm	Improving AMI Care
	Kingman Regional Medical Center *Kingman, AZ*
	Dartmouth-Hitchcock *Lebanon, NH*
	Billings Clinic *Billings, MT*
2:50pm	Q&A
2:57pm	Wrap-up and Next Steps

Quality Improvement for Institutions

Improving Organizational Culture and AMI Outcomes

1. Established evidence base



ORIGINAL RESEARCH | IMPROVING PATIENT CARE

What Distinguishes Top-Performing Hospitals in Acute Myocardial Infarction Mortality Rates?

A Qualitative Study

2. Disseminated via two approaches

- Surviving MI: American College of Cardiology
- Leadership Saves Lives: Mayo Clinic Care Network

3. Integrate efforts

- Distil and package LSL lessons and tools for broader audiences

Surviving MI: Leadership Saves Lives
Kingman Regional Medical Center

Kingman Regional Medical Center

- 235 Beds
- Independent, not for profit health system
- Member of Mayo Clinic Care Network
- Teaching Hospital – Family Practice & ER

- 8700 admissions
- 53,000 ER visits
- 417,000 outpatient visits
- 1900 employees
- 270 physicians on staff

Service Area

Mohave County, Arizona

KRMC Service Area

Primary Service Area – Approximately 75,000 people

- Disproportionate number of elderly and poor when compared to national demographics
- Some communities are over 60 miles from the hospital

Payer Mix:

- 57% Medicare
- 22% Medicaid
- 18% Commercial
- 3% Self Pay

Mission and Vision

Kingman Regional Medical Center Mission

Serving our community with compassion and commitment.

Our Vision

To provide the region's best clinical care and patient service through an environment that fosters respect for others and pride in performance.

Problem and Objective

- **The problem is AMI mortality is too high**
- **Our objective is:**
  - Reduce in hospital AMI mortality rate, not risk adjusted by 50% of baseline by June 2016.
  - Reduce risk standardized AMI mortality rate by 15% of the National Average by June 2016.

Our Journey

Guiding Coalition Formation August 2014

- Initial group > 20 members
- Initial Objective: Not S.M.A.R.T.

Root Causes Identified:

- Timeliness of EKGs
- Pathways, Protocols and Guidelines
- Discharge Process

Our Journey

Strategies Selected:

1. Partnership with EMS
2. Organizational culture that supports creative problem solving
3. Physician and nurse champion for AMI care
4. Nurses consistently assigned to the Cardiac Catheterization Laboratory

Our Journey

- The team initially looked perfect, but had internal struggles. We were too big and we had silos. We were making individual contributions, but not functioning as a team.
- We were “Transactional” leaders, but were not “Transformational” leaders.

Our Journey

- CEO Visits Guiding Coalition Meeting March 2015

“**Our vision is to provide the regions best clinical care and patient service through an environment that fosters respect for others and pride in performance.”**

- Our results did not match our vision.

Our Journey

With a renewed sense of urgency, we:

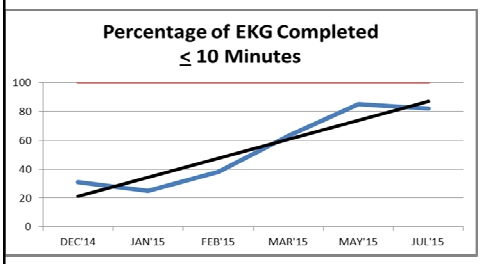
- Reconnected to our vision.
- Our Guiding Coalition was re-defined and downsized.
- Re-defined our objective, making it S.M.A.R.T
- Empowered front line staff to support creative problem solving and process improvement.
- Began making more "transformations" than "transactions".
- Stopped frequent meetings!

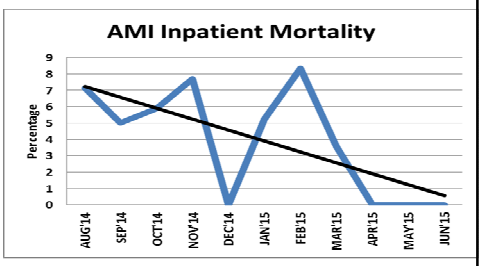
Our Journey: Evidence of Creative Problem Solving

- ✓Implemented "Nurse First"
- ✓Trained ED CNA staff to preform EKGs
- ✓Created space in our ED to obtain EKGs
- ✓Synchronized Clocks
- ✓Created "Stemi Boxes"
- ✓Created AMI order Set
- ✓Improved Pt. Education at Discharge
- ✓Pharmacist rounding on all AMI patients from Cath Lab
- ✓Improved Compliance with PCI in 90 minutes

Our Journey

Evidence that we were moving in the right direction





Our Journey

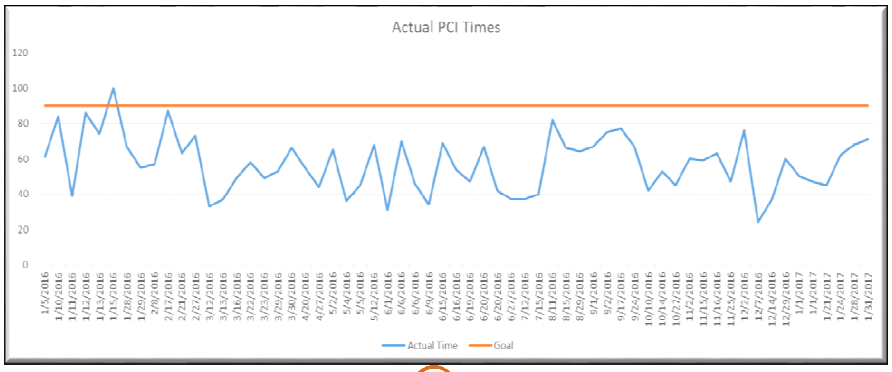
Inspired by our progress, our Guiding Coalition began:

- Regular "drill down" on all AMI mortalities as well as PCI in 90 minute fallouts.
- Checked patient status:
  - Admission vs. Observation
  - Post Procedure in a bed
- Checked/Validated Coding
- Problems were noted, but with the collective efforts of the team issues were identified and addressed.

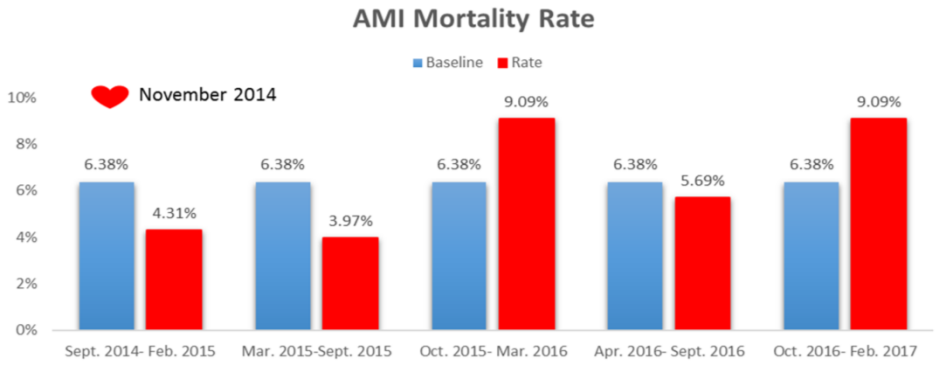
Percutaneous Coronary Intervention (PCI)
Door to Balloon Time

Percent of Patients with
Door to Balloon time of ≤90 minutes

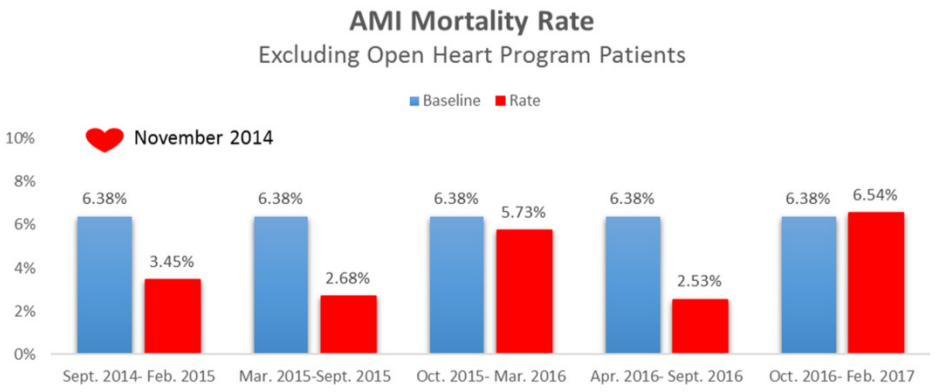
FY 2016 Target:	**95%**
FY2015	**84.6%**
FY2016	**93.4%**
FY2017 (through January)	**100%**



Our Results



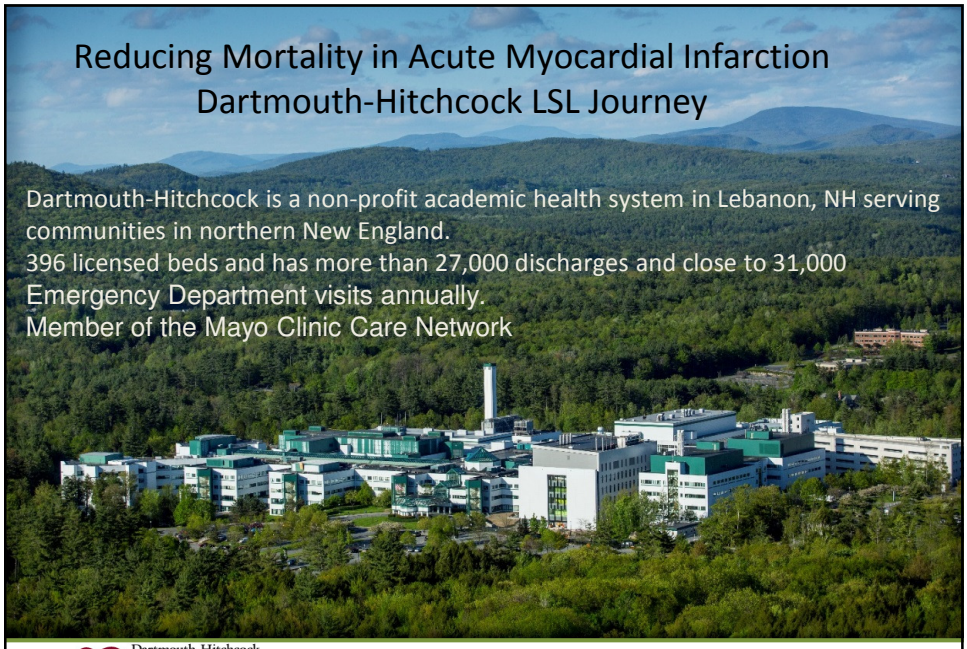
Our Results



Our Change Process

1. Pull together a team to drive the change
2. Define a S.M.A.R.T. goal
3. Create the Vision
4. Instill a sense of urgency
5. Empower staff to preform / utilize creative problem solving
6. Engage direct care staff – “Our Staff Save Lives”
7. Link efforts to outcomes
8. Reward short term wins
9. Communicate. Don’t fall back, and never let up!

Reducing Mortality in Acute Myocardial Infarction
Dartmouth-Hitchcock LSL Journey



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Nathaniel W. Niles, MD
Sheila M. Conley, BSN, RN

Dartmouth-Hitchcock

Quality Improvement for Institutions

Surviving MI

AN ACC QUALITY INITIATIVE

Yale Global Health Leadership Institute

LEADERSHIP SAVES LIVES

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Initial Action Steps

- Recruit a multi-disciplinary "Guiding Coalition" at DHMC
- Learned about what AMI mortality (STEMI vs NSTEMI) looks like here at DHMC

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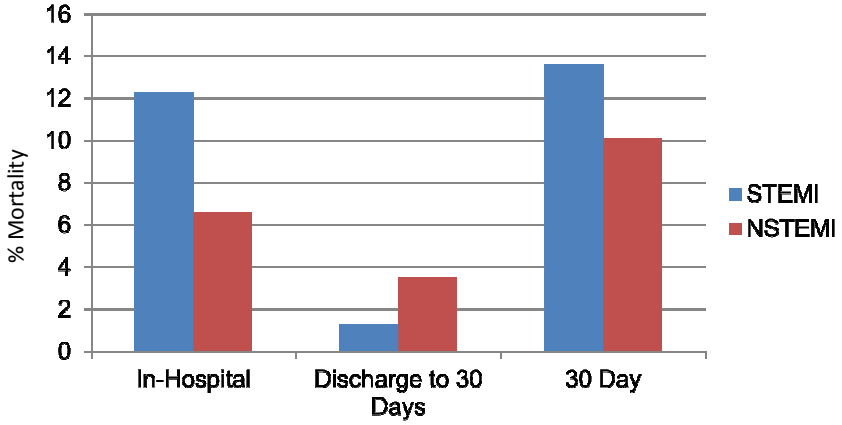
Best Estimates for DHMC STEMI/NSTEMI Mix

Based on DHMC STEMI registry and 2009-2012 CMS data
Age Group ≥ 65 years
N=781



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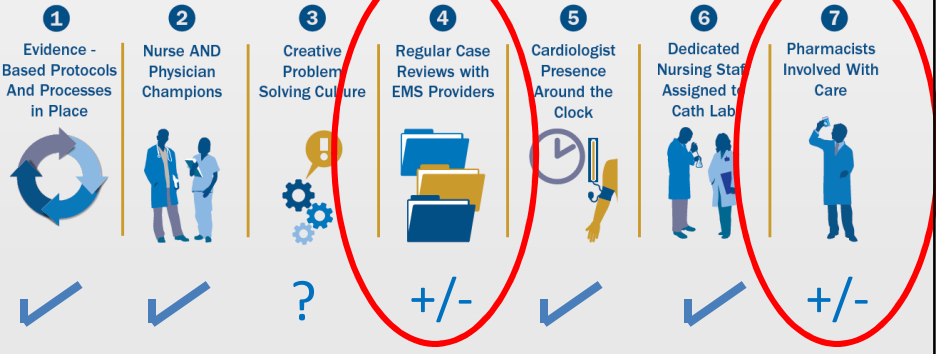
Key Strategies:



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Finding More Strategies

Root Cause Analysis = Mortality Chart Review

- Researched and designed Chart Review tool
  - Modeled after Mayo Clinic tool
    - Focuses reviewer on judging Preventable, Possibly Preventable and Not Preventable in hospital mortality
    - 11 domains of contributory issues
  - Tool placed on line (REDCap) for easy access

- Forty-three deaths in the ≥ 65 years age group reviewed (2 years period ending Dec 2014)
  - 43 reviewed by MD and RN
  - 43 reviewed by 2nd MD to de-conflict ratings/opinions

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AMI Mortality Chart Review

	"Discharge" Diagnosis	
	STEMI	NSTEMI
Number (%)	17 (40%)	26 (60%)
Age	78.8	79.4
Female Gender	25%	37%
Admitted to Cardiology	94%	85%
Mean TIMI risk score	7.9 (max 14)	5.1 (max 7)
Mean Risk	26% 30 day mortality	26% death, re-MI, recurrent ischemia, urgent revasc.
Initial code status DNR	50%	11%
Cath performed	70%	65%
PCI attempted	55%	22%
Cardiogenic shock	62.5 %	55.5%
Death within 48 hours	62.5%	33.3%

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Root Cause Analysis (n=43)

Scenario	Patients #	Ongoing effort to address
Not Preventable	**25**	
Aggressive care – Death not preventable	18	NA
Patient/Family did not wish aggressive care	7	√
Definitely Preventable	**0**	
Possibly Preventable	**16**	
STEMI with Cath lab Complication	1	√
STEMI with Iatrogenic infection	1	√
STEMI with poor communication with referring hospital	2	√
NSTEMI with Cath lab Complication	1	√
NSTEMI → Missed STEMI/Delay in revascularization	**2**	**Opportunity?**
NSTEMI with delay in initial evaluation, timely re-evaluation	**2**	**Opportunity?**
NSTEMI with Suboptimal Hospitalist/Cardiology fellow supervision/communication	**2**	**Opportunity?**
NSTEMI with Delay in Catheterization	**1**	**Opportunity?**
NSTEMI with Delay in ECHO	**2**	**Opportunity?**
NSTEMI with delay in CT surgery evaluation	1	√
NSTEMI with CABG Complication (failure to wean from pump	1	√
Coding Error (not AMI)	**2**	**Opportunity?**

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Timing of Development of Critical Illness

	Setting of cardiac arrest, respiratory failure or hypotension/shock				
Admit Dx	Pre hospital	ED	ICCU/CVCC (pre cath)	Cath Lab	Post Cath
STEMI (n=17)	4	4	1	5	3
NSTEMI (n=26)	3	5	**12**	2	4

Can we shorten or eliminate the time NSTEMI patients spend in ICCU/CVCC waiting for cath?

Can we detect clinical deterioration in ICCU/CVCC at an earlier point in time and intervene before an irreversible deterioration occurs?

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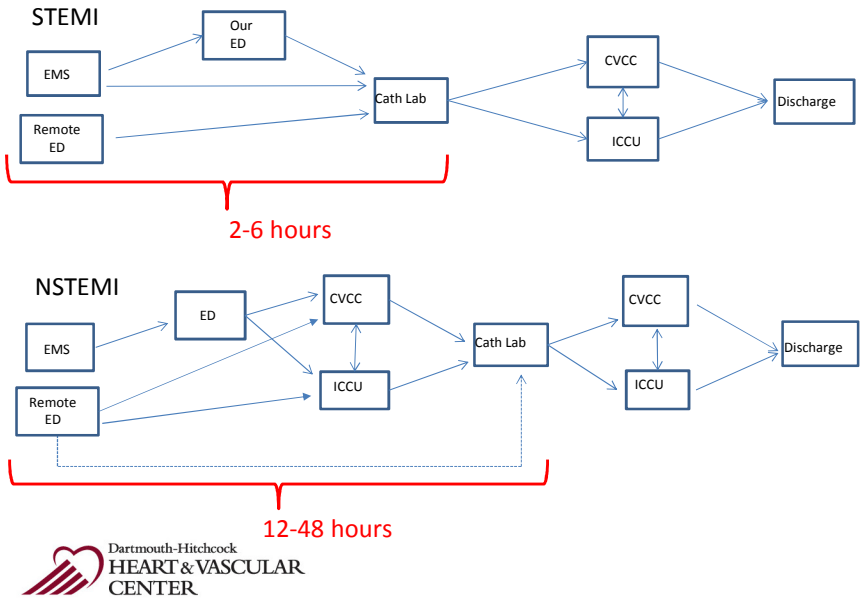
Process Maps



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Strategies (Focus on NSTEMI)

- Improve pre-transfer triage of NSTEMI patients coming from referral Emergency Departments
- Push NSTEMI process of care toward earlier treatment decision
- Lower the threshold for decision for early invasive evaluation in NSTEMI patients - Recent RIDDLE-NSTEMI randomized trial supports this approach
- Lower the threshold to initiate formal re-evaluation of an admitted patient with an ACS diagnosis **and new, recurrent or worsening symptoms**

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Selected Strategy #1
NSTEMI Process of Care Proposal

- All NSTEMI transfers have ECGs screened by cardiology attending at the time of the transfer request
- Define "At Risk" NSTEMI Patients
  - Refractory angina or resting/low threshold angina despite medical management
  - Grace Score >140
  - New or presumed new ST depressions on ECG
  - Significantly increasing temporal troponin pattern (>20%)
  - Signs or symptoms of Heart Failure
  - Hemodynamic instability
  - VT or VF
- All "At Risk" NSTEMI transfers verbally presented to attending as part of initial evaluation
- All "At Risk" NSTEMIs have echo evaluation for LV function assessment as part of the initial evaluation

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NSTEMI Process of Care Proposal

Implementation Experience

- Cardiology attending physician push back
  - Change = bad
  - Evidence is anecdotal
  - Perceived negative impact on 'work-life' balance
- Routine early echo 'not feasible'
- With support of section leadership and some compromise → successful implementation
- Focused education on: house staff:
  - hospitalist night coverage
  - associate providers
  - cardiology fellows
  - cardiology triage nurse (accepting transfers)
- Gradual acceptance of "at risk" status as criteria for acceptance for immediate transfer from referring hospitals

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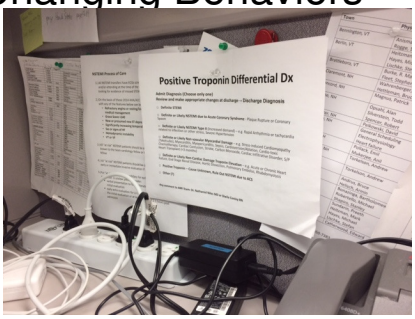
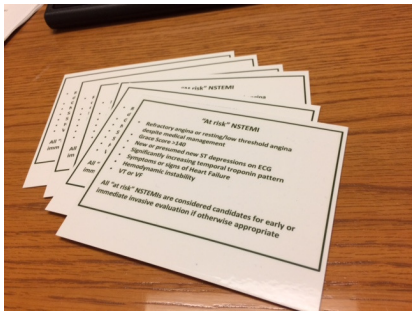
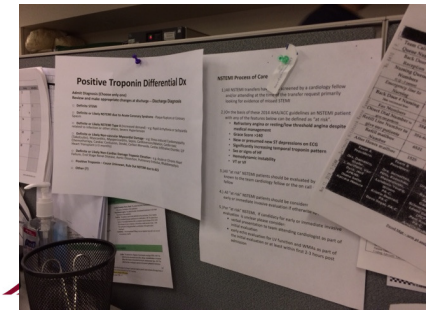
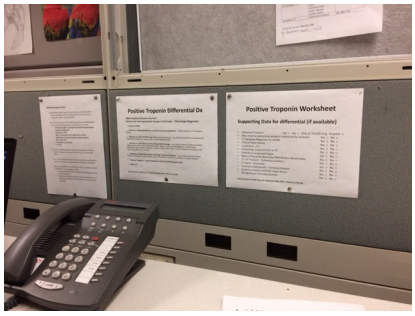
Changing Behaviors









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Selected Strategy #2
"ACS Patient in Distress Protocol"

- Goal: To identify clinical deterioration of admitted, non-ICU ACS patient and speed up the provider response and evaluation
- Completed best practices process mapping for patient admitted with ACS patient with suspected recurrent or ongoing ischemia
- Redo the "*Chest Pain* Protocol" to encompass more varied and atypical symptoms and signs of ischemia (SOB, nausea, general malaise, dizziness with hypotension, palpitations/tachycardia)
  - all nurses on floor trained to perform ECGs
  - nurse driven protocol

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Strategy #2
Implementation Experience

- Pre-work was comprehensive with nursing leadership
- Protocol/proposals were well thought out and well designed
- Senior nursing leadership support was strong
- User group chosen carefully
  - Enthusiastic reception by cardiac nurses
  - Empowerment to initiate protocol
  - New skill training (ECG)

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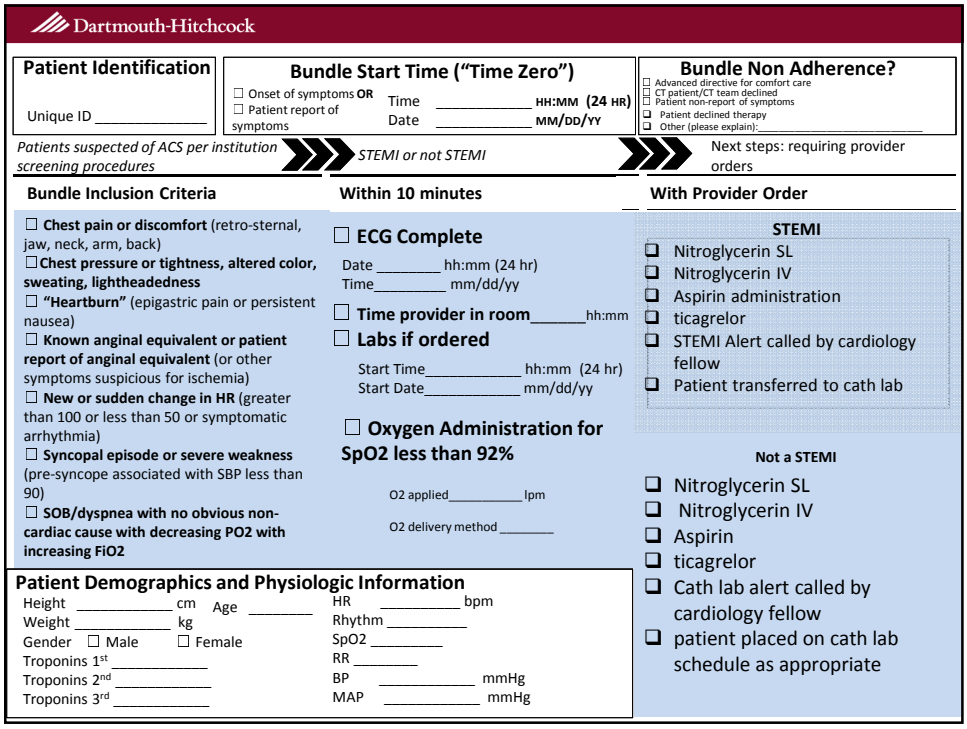

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ACS Patient in Distress Pilot

- 12 week period in Intermediate Coronary Care Unit (ICCU)
- ~750 Discharges in that period
- Protocol initiated in 69 patients (~9.2%)
- **Results**
  - Median time to ECG = 5 min (79% obtained within 10 min of symptom onset)
  - Median time to Provider at bedside = 9 min.
  - Troponin triggered in 39 of 69 (57%)
  - Troponin (converted to positive or increased by 20%) in 14 of 39 (36%)
  - Emergent cath triggered 7/69 (10.1%)
  - Acute STEMI 1/69 (1.4%)

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Ongoing Work – Maintain the Gain

- The coalition continues to meet monthly to assure focus on AMI mortality
- Concurrent mortality review with verbal feedback to care team to identify potentially preventable events
- "Dashboard" Creation = using the EMR to track strategy implementation and outcomes

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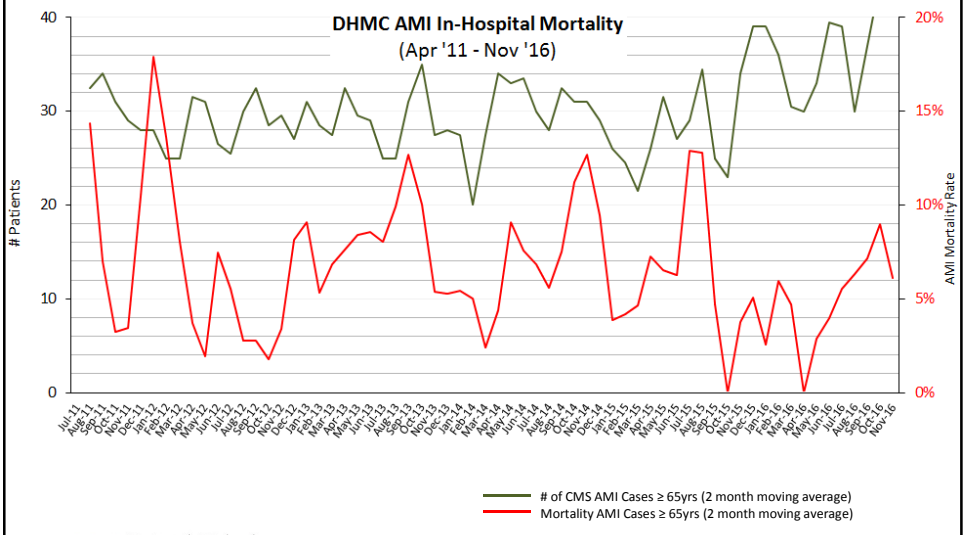

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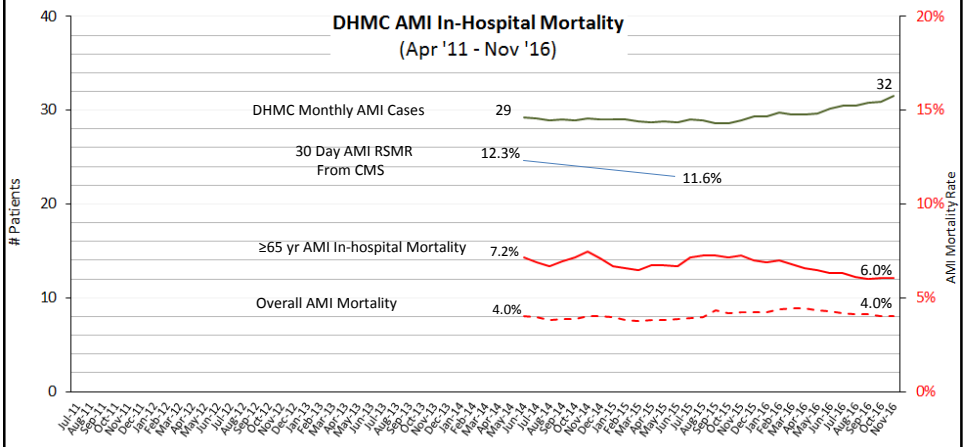

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Thank you!
Questions?

Contact info: sheila.m.conley@hitchcock.org

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Billings Clinic

Improving AMI Mortality Through Cultural Change

Our Champions Led the Charge

Date: April 24, 2017

Health Care, Education and Research

Billings Clinic

MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

U.S.News #1 Hospital in Montana 4 years in a row

ACCREDITED CPC CHEST PAIN CENTER PCI

The only accredited chest pain center in Montana

HIGH PERFORMING HOSPITALS U.S.News 2015-16 HEART FAILURE

MAYO CLINIC CareNetwork Member

Health Care, Education and Research

Regional work raised awareness of AMI care

Leadership Saves Lives

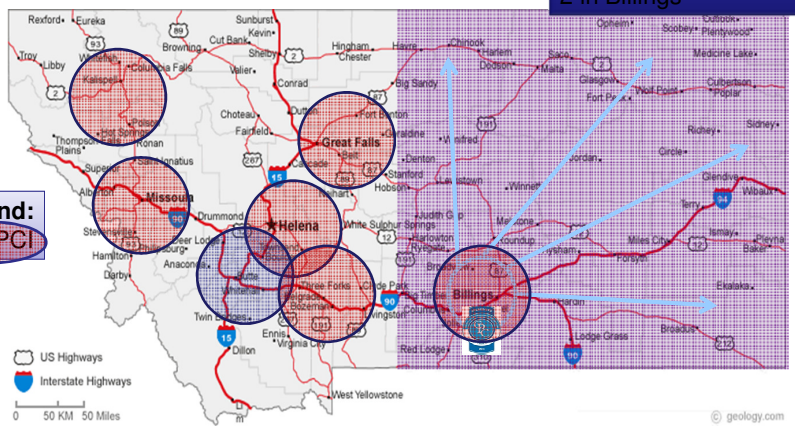
Yale project aims to improve heart attack care at Billings hospital through organizational culture

Awarded Innovation in Health Care for our regional work with LSL September 2015

Health Care, Education and Research

Montana PCI Centers

9 Total PCI Centers
8 Provide 24/7 Coverage
2 in Missoula
2 in Billings



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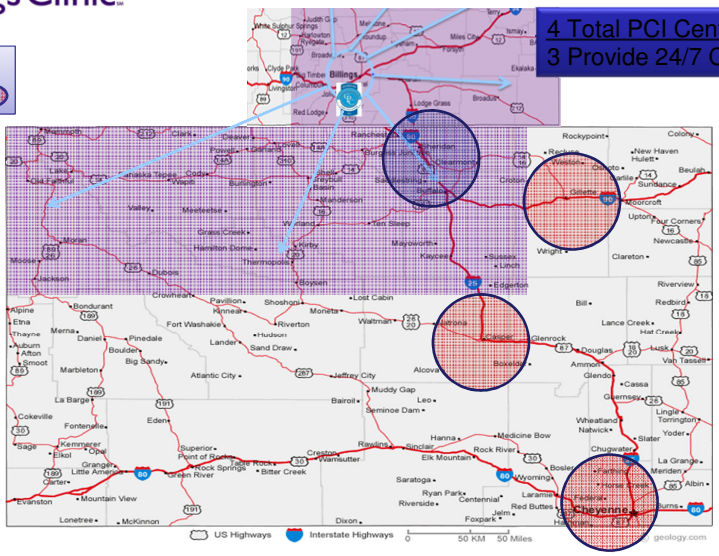
Wyoming

Billings Clinic

Legend:
24/7 PCI

4 Total PCI Centers
3 Provide 24/7 Coverage

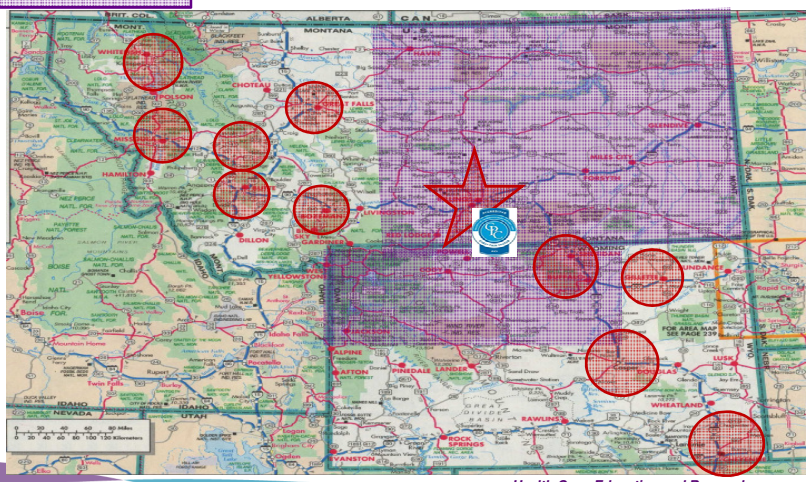


Health Care, Education and Research

Billings Clinic provides AMI coverage for ~ 105,000 square miles in our region

Billings Clinic

**Area in Purple is our ~ referral area



Health Care, Education and Research

Billings Clinic

AMI STEMIs and Transfers

Calendar Year	Total AMI's	Total STEMI	Total NSTEMI	Transfers	
2014	329	126	203	174	60% transfers
2015	364	87	277	199	55% transfers
2016	359	109	250	214	60% transfers

Health Care, Education and Research

Billings Clinic

Easy to follow order sets to initiate on all STEMI's without the need of approval from the receiving physician

Mission: Lifeline MT STEMI (ST-Segment Elevation Myocardial Infarction)
PHYSICIAN ORDERS- THROMBOLYTIC OPTION

Diagnostic Criteria for STEMI

- ST elevation at the J point in at least 2 contiguous leads of ≥2 mm (0.2 mV) in men or ≥1.5 mm (0.15 mV) in women in leads V2–V3 and/or of ≥ 1 mm (0.1mV) in other contiguous chest leads or the limb leads.
- New or presumably new LBBB at presentation occurs infrequently, may interfere with ST-elevation analysis, and should not be considered diagnostic of acute myocardial infarction (MI) in isolation. If doubt persists, immediate referral for invasive angiography may be necessary. Consult with PCI receiving center.
- ECG demonstrates evidence of ST depression suspicious for a Posterior MI consult with PCI receiving center.

***If initial ECG is not diagnostic but suspicion is high for STEMI consider serial ECG's at 5-10 minute intervals

ACTIVATE TRANSPORT and Determine transport mode

Contact PCI Center/Consult Cardiologist: DO NOT DELAY MEDICATIONS BELOW

☐ _____Hospital
☐ Call: _____-_____-_____
☐ Send records with patient upon transfer

Patient Name:
Allergies:

STANDARD ORDERS & LABS

- Apply Continuous Cardiac Monitor
- Vitals q 5 min x3, then q 10 min (with automatic BP and pulse oximetry)
- Insert (2) peripheral large bore IVs (0.9% NaCl @100mL/hr or Saline lock)
- Portable CXR STAT
- Labs: BMP, CBC, Troponin, Lipid profile, PT/INR, PTT, all labs STAT, do not delay transfer for results – Fax when available

Administer Oxygen as needed to keep SpO2 > 94%

Optional Medications

Nitroglycerin IV or 0.4 mg SL
Morphine Sulfate 1 - 5 mg IV
Ondansetron (Zofran) 4 mg PO or IV
Metoprolol 25 mg PO
CONTRAINDICATIONS FOR METOPROLOL:
Do not give if any of the following: Signs of heart failure or shock, heart rate less than 60 or more than110, systolic blood pressure less than 100, second or third degree heart block, severe asthma or reactive airway disease

***ALL PATIENTS* must receive:**
1. Aspirin 324 mg chewed
2. Heparin or Lovenox

☐ Heparin IV Bolus (60 Units/kg, max 4,000 Units) *AND*
Heparin IV Drip (12 Units/kg/hr, max 1,000 Units/h)
OR
☐ Enoxaparin (Lovenox): Age < 75 yrs, 30 mg IV Push then 1 mg/kg SubQ 15 min later and then q 12 hours. SubQ Max Dose=100 mg *OR*
☐ Enoxaparin (Lovenox): Age> 75 yrs, 0.75mg/kg SubQ and then q 12 hours SubQ Max Dose= 75 mg

FIBRINOLYSIS CONSIDERATIONS

ABSOLUTE CONTRAINDICATIONS FOR FIBRINOLYSIS (TNK) IN STEMI
1. Any prior intracranial hemorrhage
2. Known structural cerebral vascular lesion (e.g., arteriovenous malformation)
3. Known malignant intracranial neoplasm (primary or metastatic)
4. Ischemic stroke within 3 mo except acute ischemic stroke within 4.5 hrs
5. Suspected aortic dissection
6. Active bleeding or bleeding diathesis (excluding menses)
7. Significant closed-head or facial trauma within 3 months
8. Intracranial or intraspinal surgery within 2 months
9. Severe uncontrolled hypertension (unresponsive to emergency therapy)

RELATIVE CONTRAINDICATIONS FOR FIBRINOLYSIS: (TNK) IN STEMI
1. History of chronic, severe, poorly controlled hypertension
2. Significant hypertension on presentation (SBP > 180 or DBP > 110 mmHg)
3. History of prior ischemic stroke more than 3 months, dementia, or known intracranial pathology not covered in contraindications
4. Traumatic or prolonged CPR (> 10 minutes)
5. Major surgery (within last 3 weeks)

If first medical contact to balloon expected > 120 minutes
1. **FIBRINOLYSIS: Tenecteplase IV (TNKase)** or available thrombolytic

****Door to Lytic administration goal < 30 Minutes****

Less than 60 kg	30 mg	6 mL
60 or more but less than 70	35 mg	7 mL
70 or more but less than 80	40 mg	8 mL
80 or more but less than 90	45 mg	9 mL
90 or more kg	50 mg	10 mL

Health Care, Education and Research

Billings Clinic

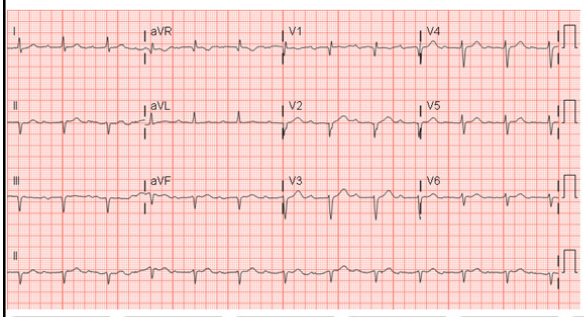
MISSION: LIFELINE

Date: 9/21-9/23/15 **Gender:** 75 y/o Male

Chief Complaint/Diagnosis: Acute onset chest/back pain, diaphoresis and indigestion 1 ½ hours prior to ED arrival/ Acute Inferior ST Elevation MI

Referral Hospital:
XXX
Transport Agency:
Ground ALS

ECG post PCI to RCA



Case Synopsis: Upon arrival to Billings Clinic, patient taken directly to cath lab emergently due to continued chest pain s/p fibrinolytic administration. Left heart cath demonstrated a critical subtotal occlusion of the distal portion of the RCA prior to the posterior descending and posterolateral bifurcation. First attempts for reperfusion were unsuccessful due to calcified tortuous lesion, but was ultimately intervened via angioplasty and placement of a drug-eluting stent. Patient recovered in ICU immediately post procedure and transitioned to CVU the following morning. Echo on 9/22 demonstrated an EF 55-59% with no evidence of wall motion abnormalities and normal systolic function. Grade 1 diastolic dysfunction was noted alongside a mildly dilated atrium. He was discharged home on day 2 in stable condition with a cardiac regimen of Brilinta 90 mg twice daily x 1 year, aspirin 81 mg daily indefinitely, metoprolol tartrate 25 mg twice daily, HCTZ-lisinopril 12.5/20mg daily and pravastatin 40 mg at bedtime. Will follow up with cardiologist in 2-3 weeks and enroll in cardiac rehab.

Patient called 911- No	ED Arrival 15:59	First ECG 16:01	Transporting Agency Called: 16:10	Lytic Admin Time: 16:15	Door In/Out from first facility: 39 Minutes

D2N: 16 Minutes	Arrival to Billings Clinic: 17:30	Total Transfer Time: 52 Minutes	Arrival to Cath: 17:49	PCI Time: 18:09	D2D2B Time: 130 Minutes

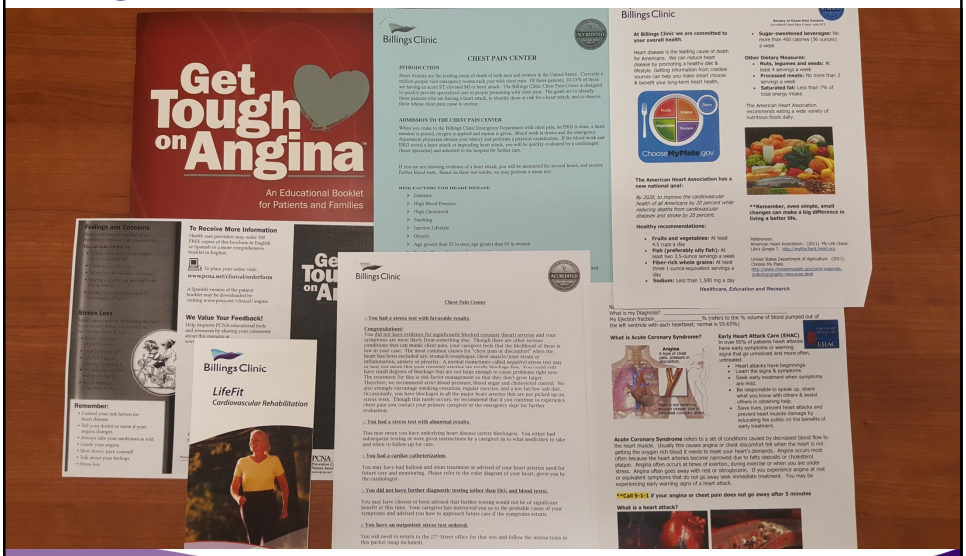
Billings Clinic

Provider Champions were instrumental in our successes

Health Care, Education and Research

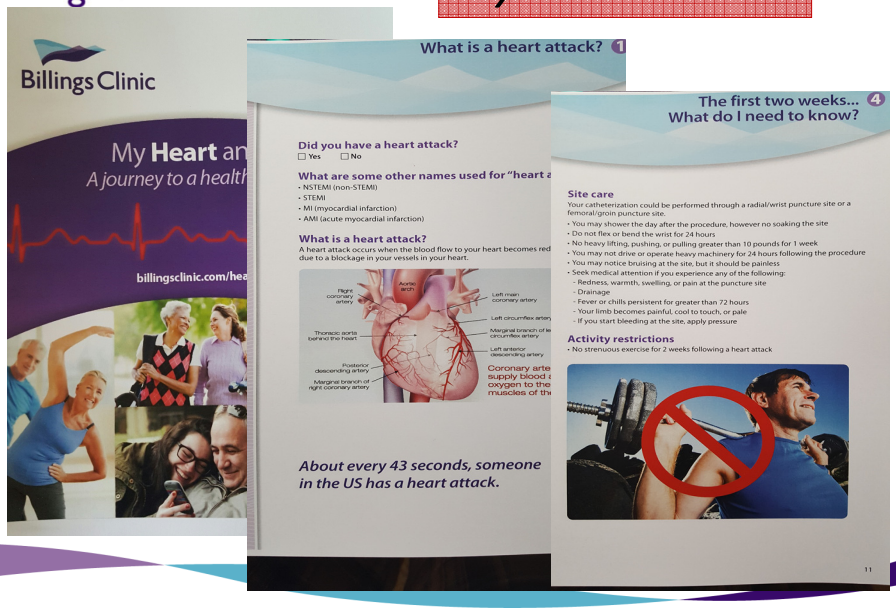
Billings Clinic

Previous patient education prior to *My Heart and I for all AMI/PCI patients*



Billings Clinic

My Heart and I



Billings Clinic

Measuring Progress

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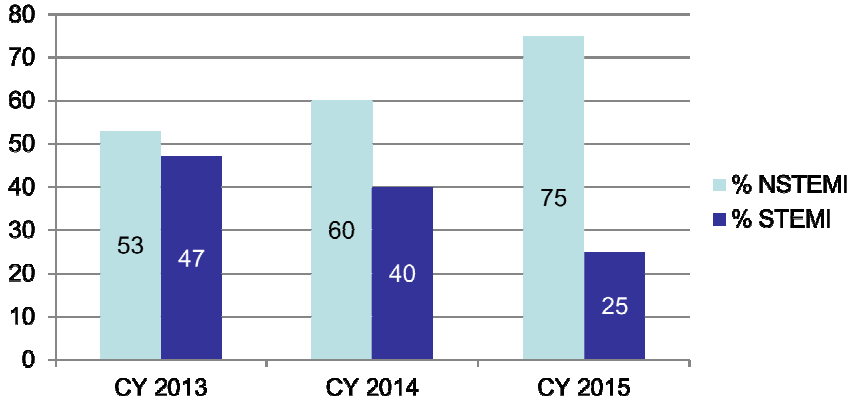
Upward trend of NSTEMI Cases



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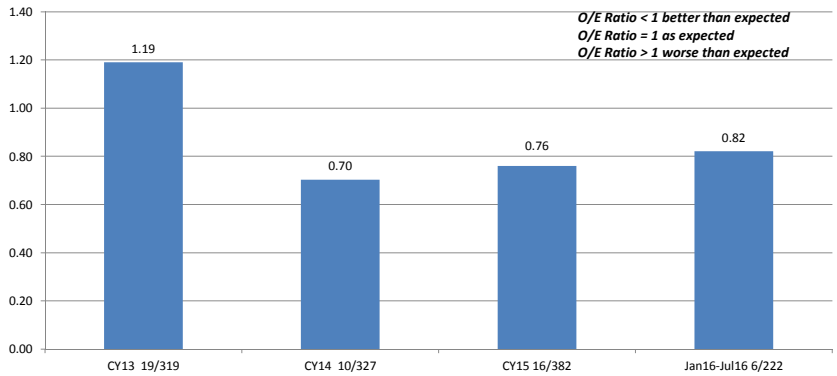
O/E Ratio Per Year

Leadership Saves Lives AMI
Mortality Observed to Expected Ratio by Month

Observed less than Expected is desirable



Calendar Year	Total Cases	Outcome Cases	Total Deaths for Outcome Cases	Observed	Expected	Variation	O/E	SS
CY13 19/319	328	319	19	5.96%	5.01%	0.95%	1.19	
CY14 10/327	331	327	10	3.06%	4.35%	-1.29%	0.70	*
CY15 16/382	387	382	16	4.19%	5.49%	-1.30%	0.76	*
Jan16-Jul16 6/222	227	222	6	2.70%	3.28%	-0.57%	0.82	

Source: Quality Advisor

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CMS AMI 30-Day Mortality

AMI 30-Day Mortality Measure Results

- CMS FY 2018 Hospital VBP Performance Period
- Hospital Discharge Period: Oct 1, 2013 through June 30, 2016
- Billings Clinic AMI performance better than Achievement Threshold and Benchmark
- AMI Predicted Deaths less than Expected Deaths for the Risk-Standardized Mortality Rate
- Billings Clinic AMI survival rate 87.7%

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Leadership Saves Lives Team

- Project Manager, Beth Degenhart Director of Cardiology
- Physician Champion, Dr. Brian Rah Chief of Cardiovascular Services
- PA Champion, Erin LaFavor PA
- RN Champion, Carrie Wright, CPC Coordinator
- Clint Seger, MD CMO Regional Services
- Annie Smith, Cardiology Technical Assistant
- Lori Linder, RN Quality Specialist
- Operational Excellence, Tom Bick
- Nick Wolter, CEO
- Laurie Smith, CNO
- Chad Miller, VP Clinic Services
- Bob Merchant, MD CMO Hospital
- Randall Gibb, MD CMO Clinic
- Karen Cabell, DO Assoc. Chief
- Randy Thompson, MD CMIO
- Dave Bunkers, Executive Director Critical Care Services
- Shere Cooney, CVU RN
- Susan Keys, Pharmacists CVU
- Rich Mickelson, Manager Cardiology
- Dania Block Manager CVU
- Rikki Rumph, Clinical Coordinator Emergency Department
- Ellen Edlund, Cath Lab RN
- Karrie Cleveland, Manager Care Management
- Chris Candelaria, Clinical Coordinator Intensive Care Unit
- Micaleen Fulkerson, Emergency Department RN
- Casey Harrod, Exercise Physiologist

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References

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- Premier Quality Advisor

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Thank You

Surviving MI

AN ACC QUALITY INITIATIVE

Please submit your questions for the moderated question and answer session.

SurvivingMI@acc.org
CVQuality.ACC.org/SurvivingMI

Quality Improvement for Institutions

Quality Improvement for Institutions

The Quality Improvement for Institutions program combines the ACC's NCDR data registries with toolkits and proven hospital-based quality improvement initiatives like Hospital to Home, the D2B Alliance and Surviving MI.

Simple Solutions. Big Impact. CVQuality.ACC.org.

Quality Improvement for Institutions