Getting Started Kit:
Improved Care for Acute Myocardial Infarction

How-to Guide

100,000 Lives Campaign

We invite you to join a Campaign to make health care safer and more effective — to ensure that hospitals achieve the best possible outcomes for all patients. The Institute for Healthcare Improvement (IHI) and other organizations that share our mission are convinced that a remarkably few proven interventions, implemented on a wide enough scale, can avoid 100,000 deaths between January 2005 and July 2006, and every year thereafter. Complete details, including materials, contact information for experts, and web discussions, are on the web at http://www.ihi.org/IHI/Programs/Campaign/.

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What Is Acute Myocardial Infarction (AMI)?

Acute Myocardial Infarction (AMI) is a sudden loss of blood supply to an area of the heart, causing permanent heart damage or death. There are different types of AMI, classified by the location in the heart of the actual event (e.g., inferior wall vs. anterior wall) or the type of changes seen on an electrocardiogram (ST elevation or non-ST elevation).

A physician must consider a variety of parameters in making a diagnosis of AMI, including the presence of elevated troponin levels, ST elevation, or changes on electrocardiograms, as well as the symptoms stated by the patient, some of which are considered as “classic AMI” symptoms (e.g., chest pain). Presentation of AMI may vary and not all patients will have the same signs and symptoms; in fact, some may present in an atypical manner with none of the aforementioned signs or symptoms.

For the purposes of the 100,000 Lives Campaign, we are starting with the simple definition that includes all patients with AMI and does not differentiate by the various types or modes of presentation.

Why Is Delivering Reliable, Evidence-Based AMI Care Important?

Every year, an estimated 1.1 million people in the United States are diagnosed with an AMI, and approximately 350,000 of these patients die during the acute phase. The American College of Cardiology (ACC) and the American Heart Association (AHA) have worked with clinicians to develop guidelines for care based on the evidence and to promote awareness of evidenced-based care in the clinical community. Efforts have also been made to educate the general public and emergency responders about the symptoms of AMI and the need for immediate treatment.

The Joint Commission for Accreditation of Healthcare Organizations (JCAHO) and the Centers for Medicare & Medicaid Services (CMS) have both identified AMI as an important area for improvement in hospitals. Both organizations have included AMI as a diagnosis for which participating hospitals must collect and report data on quality measures. Public reporting and access to results of this data have begun and it is likely that all hospitals will be required to publicly report this data in the future.

What Are the Key Components of Reliable, Evidence-Based AMI Care?

Studies have shown that patients with AMI should receive specified components of care in order to reduce morbidity and mortality. The total number and type of care components a patient receives during the hospital course and post-discharge may vary based on clinical condition and other co-morbidities. However, there is strong evidence in the literature to support that the following seven key care components should be provided to all AMI patients:

- Early administration of aspirin
- Aspirin at discharge
- Early administration of beta-blocker
- Beta-blocker at discharge
- ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for patients with systolic dysfunction
- Timely initiation of reperfusion (thrombolysis or percutaneous intervention)
- Smoking cessation counseling

The American College of Cardiology has included these seven components in their recommended guidelines for AMI care. Cardiologists and expert panels have reached

broad consensus that these care components should be provided to all patients with an AMI, unless a clear contraindication exists and is documented in the medical record.

Potential Impact

Many references in the literature—far more than can be summarized here—demonstrate the effectiveness of the seven key components of AMI care. For example, studies report that prompt aspirin administration results in a 15% reduction in vascular events, and beta-blockers reduce AMI mortality in the first week by 13% and long-term mortality by 23%.

> Antman EM, Lau J, Kupelnick B, Mosteller F, Chalmers TC. A comparison of results of meta-analyses of randomized controlled trials and recommendations of clinical experts: treatments for myocardial infarction. *JAMA*. 1992;268:240-248.
>
> Hennekens CH, Albert CM, Godfried SL, Gaziano JM, Buring JE. Adjunctive drug therapy of acute myocardial infarction – evidence from clinical trials. *N Engl J Med*. 1996;335:1660-1667.

The Gap Between Reliable, Evidence-Based AMI Care and Actual Care

Researchers have studied whether the seven evidence-based care components are provided to patients by reviewing their medical records for documentation of care. Despite the evidence demonstrating the effectiveness of these care components, many patient medical records have no documentation that these care components were either provided or contraindicated. A study by the RAND Corporation, including a review of thousands of patient records, showed that only 61% of AMI patients received aspirin and 45% received beta-blockers.

> McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med*. 2003;348:2635-2645.

CMS collected data from state Quality Improvement Organizations (QIOs) on the rate of adherence to the AMI care components in Medicare patients. CMS found that the

median state rate for administering ACE-inhibitor at discharge for patients with systolic dysfunction in 1998-1999 was 71%. Despite improvement efforts in this area, the median increased to only 74% in 2000-2001.

Jencks SF, Huff ED, Cuerdon T. Change in the quality of care delivered to Medicare beneficiaries, 1998-1999 to 2000-2001. *JAMA*. 2003;289:305-312.

Clinicians often challenge these numbers and frequently do not believe the results. It is important to note that the statistics are based on documentation. If patients receive the key care components, but clinicians do not document the care clearly and thoroughly, then there is no way to capture the information. Perhaps in some cases actual practice is better than these studies have shown, but without the documentation we will never know. However, even if the actual rate of compliance with evidence-based care is higher than the studies reflect, it is still well below what it should be and what patients have a right to expect.

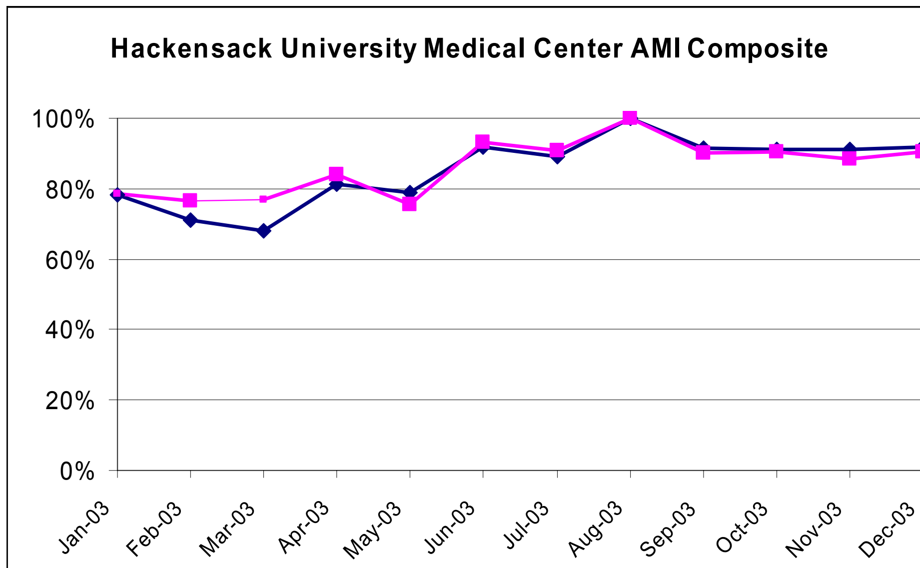
Examples of Success

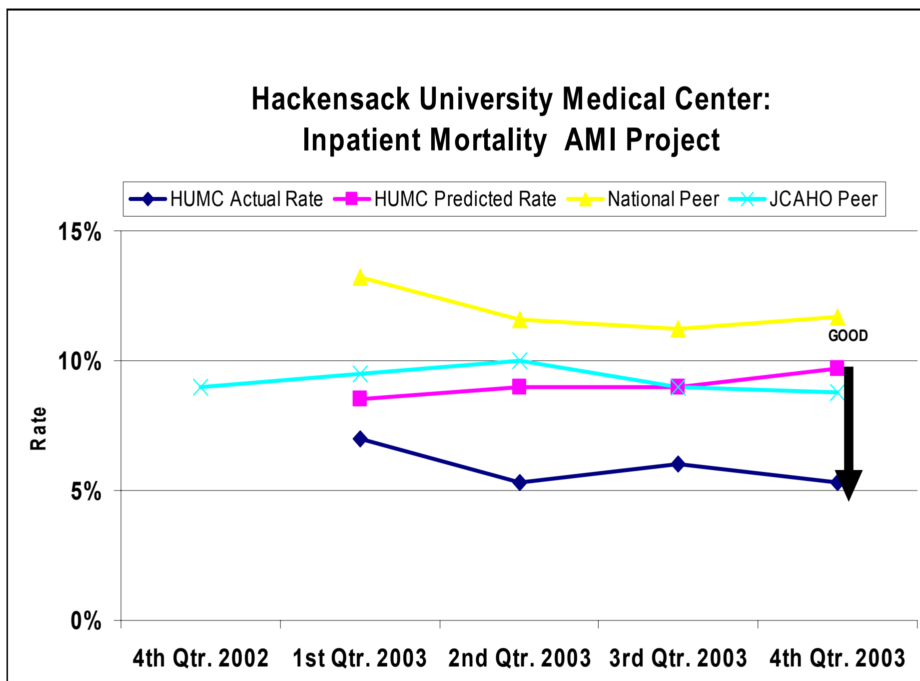
A few hospitals have reported significant improvement in applying evidence-based AMI care, using a variety of approaches. For example, Intermountain Health Care (Salt Lake City, Utah), implemented a discharge medication program including key AMI care components, contributing to greater than 90 percent compliance with aspirin and beta-blocker guidelines among AMI patients.

Lappe JM, Muhlestein JB, Lappe DL, et al. Improvements in 1-year cardiovascular clinical outcomes associated with a hospital-based discharge medication program. *Ann Intern Med*. 2004;141:446-453.

Hackensack University Medical Center (HUMC) in New Jersey has been working on improving AMI care for some time. HUMC is also participating in a pay-for-performance demonstration project with Premier and CMS, which includes AMI as one area of focus. In the demonstration project, hospitals are ranked based on performance using a composite measure that takes into account which AMI patients had documentation that

all seven components of care were provided if appropriate. HUMC had a composite score of 72% for AMI in the first quarter of 2003. Improvement efforts led by their Cardiac Service Line, which included representatives from the emergency department, inpatient units, and cardiology, increased the composite score to 91% by the fourth quarter of 2003. During the same time period, the inpatient mortality for AMI decreased from 7% to 5.2%, considerably lower than their national peer group and the average from hospitals reporting to JCAHO.

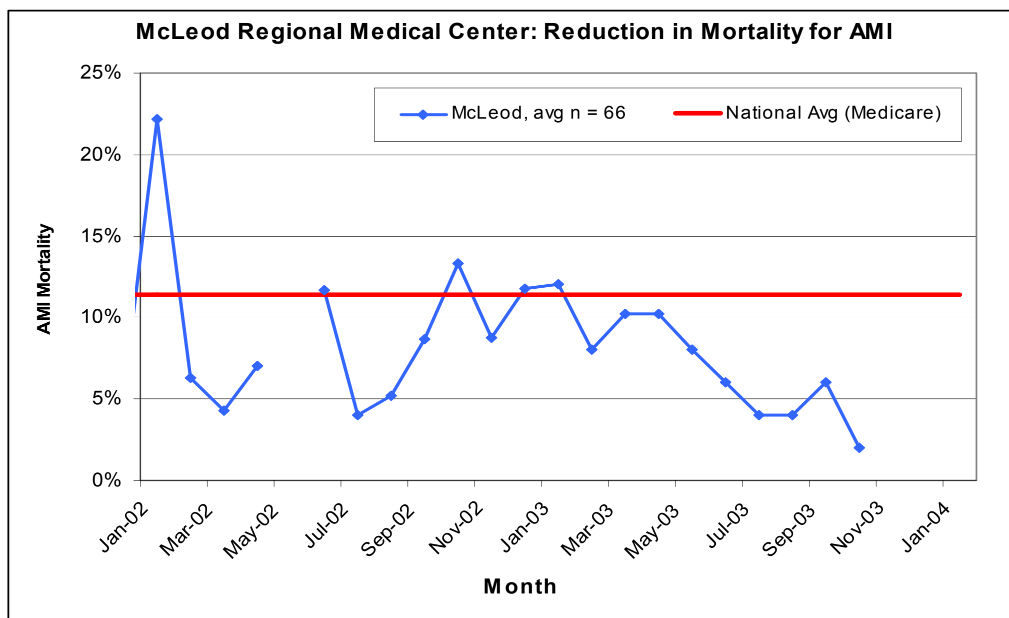




McLeod Regional Medical Center in South Carolina has been a member of the Pursuing Perfection initiative, funded by The Robert Wood Johnson Foundation. Participating hospitals have worked on providing patients with “perfect care” and the team at McLeod chose AMI as an area of focus.

McLeod defines “perfect care” for AMI patients as provision of all seven key components of care, or documentation of clear contraindication. Patients are only counted as having received “perfect care” if all seven care components are documented as having been given in appropriate time frames, or that clear contraindications existed. If documentation for any one item is missing, the patient is not considered as having received “perfect care.” In the measure of “percent of AMI patients with perfect care,” all AMI patients are included in the denominator and only those AMI patients with documentation of perfect care are included in the numerator.

The team at McLeod developed protocols as one step toward their goal of delivering perfect AMI care. In January 2001, 80% of AMI patients received perfect care; this increased to 100% by November 2003. Inpatient mortality for the same time period decreased and for the past year has been 4%, nearly half of the average reported by hospitals to JCAHO.



Forming the Team and Setting Your Aim

Before starting any improvement work, it is always wise to establish the aim of the work. In this area of the Campaign, the aim is to save lives by reducing AMI mortality by June 2006.

A team should develop an aim. From the list of the seven care components for AMI, determine the key stakeholders in your organization who have essential roles in ensuring that patients receive the care components. For example, several of the AMI care components must be provided or started in the emergency department, so it will be essential that you include someone from that area.

An example of a team for improving AMI care includes the following:

- Chief of Cardiology
- Chief of Emergency Medicine
- Nursing Clinical Coordinator or Educator
- Case Manager
- Quality Improvement Representative

A sample aim statement might be:

- Reduce inpatient AMI mortality by 40% by implementing all seven evidence-based care components by June 2006.

Note that the sample aim statement includes 1) a clear statement of purpose, 2) a measurable goal, 3) a description of how this will be done, and 4) a specific timeframe. This is only meant to be an example; your team should develop its own aim statement so that the team will feel ownership and support it. If your organization is enrolled in the 100,000 Lives Campaign, the wording may be very similar to the example, but be sure the team discusses and adopts it first.

In order to be most effective, a core team of no more than 5 to 7 people should oversee the work. As different changes are tested, other key people in the organization can be included on an ad hoc basis, especially if they can offer some special expertise that is limited to one area of the work. For example, if your hospital has an advanced life support service (paramedics), you may want to include a representative in a few meetings if you are discussing identification of potential AMI patients prior to hospital arrival, either to provide interventions in the field or have a response team ready and waiting when the patient arrives. There would not be a need to include that person in all meetings about AMI care, since not all of the work will apply to that department.

Another approach to the improvement work is to create sub-teams to work on specific care components or groups of care components. Some of the components of care are time sensitive, such as early administration of aspirin, beta-blockers, and reperfusion via thrombolytics or percutaneous intervention. One sub-team might work only on these and include key staff related to these areas, such as emergency department, Cardiac Catheterization Lab, and nursing. Another sub-team might focus on the care components that occur later in the stay or prior to discharge, such as ACEI or ARB administration and smoking cessation counseling, and include a different group of key staff. These are just a few examples of sub-groups, which can be an effective way to divide the work and achieve improvement more quickly. The sub-groups should report their work and results to the core team, which oversees the entire project and ensures coordination.

Using the Model for Improvement

In order to move this work forward, IHI recommends using the Model for Improvement. Developed by Associates in Process Improvement, the Model for Improvement is a simple yet powerful tool for accelerating improvement that has been used successfully by hundreds of health care organizations to improve many different health care processes and outcomes.

The model has two parts:

- Three fundamental questions that guide improvement teams to 1) set clear aims, 2) establish measures that will tell if changes are leading to improvement, and 3) identify changes that are likely to lead to improvement.

- The Plan-Do-Study-Act (PDSA) cycle to conduct small-scale tests of change in real work settings — by planning a test, trying it, observing the results, and acting on what is learned. This is the scientific method, used for action-oriented learning.

Implementation: After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team can implement the change on a broader scale — for example, for an entire pilot population or on an entire unit.

Spread: After successful implementation of a change or package of changes for a pilot population or an entire unit, the team can spread the changes to other parts of the organization or to other organizations.

You can learn more about the Model for Improvement on www.IHI.org

Sample First Test of Change

In the Model for Improvement, teams conduct small tests of change to start improvement work. With this approach, team members can learn quickly what works or how changes need to be refined before full implementation.

An example of a small test of one AMI care element, administering aspirin within 24 hours of arrival, comes from Wentworth Douglass Hospital in New Hampshire. Note the size and scale of the test: very focused and specific. It would not take much time to plan this test, do it, learn if it worked, and then perhaps test it again on the same scale or expand the scale of the test.

<u>Example</u>

Goal: Walk-in patients with chest pain will receive ASA within 30 minutes.

Change: Tape ASA to triage sheet.

Scale: 1 ER nurse to test on next walk-in patient with chest pain.

Plan:

1. Educate ED staff small test of change.
2. Get ASA out of dispensing machine.
3. Tape ASA to Triage Sheet.
4. Document ASA given to patient.
5. Huddle with team to discuss.

Process Measures for AMI

Compliance with each of the seven key components of evidence-based AMI care can easily be measured. In fact, your organization may already be collecting this data for JCAHO core measures or for CMS. Documentation that each component of care was provided or contraindicated should be in the medical record for each AMI patient. These are "process measures": Improvement in an individual measure indicates that the processes surrounding that care element have improved. However, improvement in patient outcomes requires improvement in all seven measures. (See Appendix B for the Measure Information Form for each of the following measures.)

1. Early administration of aspirin

    Percent AMI patients who received ASA within 24 hours before or after hospital arrival

2. Aspirin at discharge

    Percent AMI patients prescribed ASA at discharge

3. Early administration of beta-blocker

    Percent of AMI patients who received beta-blockers within 24 hours after hospital arrival

4. Beta-blocker at discharge

    Percent of AMI patients prescribed beta-blocker at discharge

5. ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for patients with systolic dysfunction

    Percent of AMI who were prescribed for ACEI or ARB at discharge

6. Timely initiation of reperfusion (thrombolysis or percutaneous intervention)

    Percent of AMI patients who received either thrombolytics within 30 minutes of hospital arrival or Percutaneous Coronary Intervention (PCI) within 120 minutes of hospital arrival

7. Smoking cessation counseling

    Percent of AMI patients (cigarette smokers) who received smoking cessation advice or counseling during hospital stay

Overall and Outcome Measures for AMI

In addition to the process measures for each of the seven key components of AMI care, organizations participating in the 100,000 Lives Campaign should track two important measures. (See Appendix B for the Measure Information Form for each of the following measures.)

Percent of AMI Patients with Perfect Care

We should aspire to provide our patients with "perfect care": provision of all seven of the key care components, or documentation of clear contraindication.

Patients are only counted as having received "perfect care" only if all seven components are documented as given in appropriate time frames, or that clear contraindications existed. If documentation for any one item is missing, the patient is not considered as having received "perfect care."

This is an important measure and it is difficult to move. Your team will find it easier to move the individual measures first, and you should start your efforts there. If the baseline measures for perfect AMI care are low, do not be discouraged as this is not uncommon. Continue to measure on a regular basis. Once the individual measures reach high levels of performance, the perfect care measure should increase as well and your team will then be ready to apply new principles (such as reliability science) to increasing the results for perfect care.

AMI Mortality

Our ultimate goal is to reduce unnecessary deaths from AMI and save lives, so this is the critical measure of success. This outcome measure should be tracked throughout the entire course of your work, as it is only after improving the key care components and sustaining the success that mortality will improve.

Tips for Getting Started

Improving AMI care can seem like an overwhelming challenge. If your team tries to do everything all at once, it may well prove overwhelming. Here are a few tips we have learned from other quality improvement work and from those who have already achieved success in reducing AMI mortality:

1. Segment the population. Rather than trying to improve every aspect of care for every AMI patient who comes to your hospital, start with a smaller group, such as only those patients who walk into the ED with an AMI. Once your team has implemented improvements with this group, spread the improvements to other groups, such as patients who arrive by ambulance.

2. Start by designing for a homogeneous population and control as many variables as possible to test the design. There will always be exceptions that your team feels they cannot control, such as the patient transferred from another facility where it is unknown if aspirin was administered. Don't start with the exceptions; start with those for which you can control most of the factors and bring in the rest later.

3. Remember that the timed care components (such as time to reperfusion) are different from those that can be provided at any time (such as smoking cessation). Designing timed care components will require different types of strategies and redesign from designing the others.

4. Use small tests of change to test the design. (See the Model for Improvement.)

5. Measure the process; if the science is right, the outcomes will follow.

6. Consider a "service line" concept for cardiac care. If you already have one, use this group to develop your core improvement team.

7. Use standard approaches such as order sets, but remember that these alone will not accomplish the goal. Develop the order sets using evidence-based medicine and society guidelines.

8. Conduct multi-disciplinary rounds on all AMI patients and be sure to include every member of the health care team (physician, nurse, pharmacist, discharge planner, etc.).

APPENDIX A: SAMPLE DATA COLLECTION FORMS

ALAMANCE REGIONAL MEDICAL CENTER

ADDRESSOGRAPH

CONCURRENT ACUTE CORONARY SYNDROME DOCUMENTATION ALGORITHYM

Registration	Triage/EMS
Patients with the following symptoms and signs require immediate assessment by the triage nurse : ❑ Chest pain, tightness, pressure, or heaviness; pain that radiates to neck, jaw, shoulders, back or arms ❑ Persistent shortness of breath ❑ Indigestion or heartburn; nausea and/or vomiting associated with chest discomfort ❑ Weakness, dizziness, lightheadedness, loss of consciousness	Patients with the following symptoms require initiation of the ACS protocol: ❑ Chest pain or severe epigastric pain, nontraumatic in origin, with components typical of myocardial ischemia or MI: ❑ Central/substernal compression or crushing chest pain ❑ Pressure, tightness, heaviness, cramping, burning, aching sensation ❑ Unexplained indigestion, belching, epigastric pain ❑ Radiating pain in neck, jaw, shoulders, back or one or both arms ❑ Associated dyspnea ❑ Associated nausea and/or vomiting ❑ Associated diaphoresis **If these symptoms are present, obtain stat ECG.**

Medical History
The triage nurse should take a brief, targeted, initial history with an assessment of current or past history of:
- ❑ CABG, angioplasty, CAD, angina on effort, or AMI
- ❑ NTG use to relieve chest discomfort
- ❑ Risk factors, including smoking, hyperlipidemia, hypertension, diabetes mellitus, family history, and cocaine use

Note: Special Considerations
Women may present more frequently than men with atypical chest pain and symptoms.
Diabetic patients may have atypical presentations due to autonomic dysfunction.

Elderly patients may have atypical symptoms such as generalized weakness, stroke, syncope, or a chance in mental status.

☐**Order set for CHF/AMI initiated:** ☐**Physician declines order set**

ECG
Initial ECG (1hr prior to arrival or after arrival, whichever is closest to hospital arrival time) revealed ST elevation or LBBB (must be documented by physician in medical record):? ☐Yes ☐No

Lytic
The patient received thrombolytic therapy? ☐ Yes ☐ No Received Date: _________ Time: _______

Aspirin
Aspirin received w/in 24 hr. of arrival? ☐Yes ☐ No Received Date: _______ Time: ________
Contraindication to Aspirin on arrival? ☐ Yes ☐ No
Contraindicated because(must be documented by physician in medical record):
☐Terminal care, no further treatment
☐History of GI Bleed
☐Bleeding Disorder
☐Clotting disorder
☐Peptic Ulcer
☐Aspirin allergy
☐Other_________________

Beta-blocker

Beta-blocker received w/in 24 hr. of arrival? ☐ Yes ☐ No Date: __________ Time: __________

Contraindication to Beta-blocker on arrival? ☐ Yes ☐ No

Contraindicated because (must be documented by physician in medical record):

☐ HR <60 on arrival
☐ Heart Failure on arrival
☐ 2nd or 3rd degree heart block on arrival
☐ Shock on arrival
☐ SBP<90 on arrival
☐ Severe hypotension in past with beta blocker
☐ Intolerant of beta blockers
☐ Terminal care, no further treatment
☐ Active asthma
☐ Severe reactive airway disease
☐ Beta blocker allergy
☐ Other_________________

Admitted: _________ (Room #) Transferred to _________________ Discharged to ________________

Principal Admitting/Discharge Diagnosis: 1) ____

2) ____

Completed by: _______________________________ ___________________ __________

Title Date

ARMC _____

Original 11/04

Hackensack University Medical Center

HUMC EMERGENCY TRANSFERS TO CCL   STAMP OR STICKER WHEN AVAILABLE
NAME____________________________

MR# _________________________ACCT#____________________
DATE_____________

Time admitted to the ER ______________
Time of first EKG_______________
ST elevation MI   Yes_____No_____
New LBBB   Yes_____No_____
Time ASA given in ER _______________
OR Documented administration prior to arrival
At home by patient _____   By EMS______   Contraindication   ______
Time Beta Blocker given in ER _________________
OR Documented administration prior to arrival
At home by patient _______ By EMS______ Contraindication
____
F) Thrombolysis yes ______ **Time** _____________   No _____
Time cardiologist was notified _________ Cardiologist____________________
Time cardiac cath lab or call team notified ________
Log Time patient arrived in the cath lab___________
Log Time of arterial access _______________
Log Time first wire advanced to lesion _______ **Time** wire crossed
lesion________
Log Time of first intervention or inflation_______________
Disposition- Cath only_______   Cath/ PTCI _________
Cath to CABG________   Cath/PTCI/CABG______
10- Post procedure location- CCU/MICU ______   4 South _______
OR/ OHRR _______   Other   _______
Variation causing delay
____
____
____
____
____
Signature RN______________________________________

APPENDIX B

Measure Information Form:
Aspirin at Arrival

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: Percentage of acute myocardial infarction (AMI) patients who received aspirin within 24 hours before or after hospital arrival

Goal: 100%

Matches Existing Measures:
- JCAHO Core Measure AMI-1
- CMS 7th Scope of Work
- National Quality Forum

CALCULATION DETAILS:

Numerator Definition: AMI patients who received aspirin within 24 hours before or after hospital arrival

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

Denominator Exclusions:
- Patients less than 18 years of age
- Patients transferred to another acute care hospital or federal hospital on day of arrival
- Patients received in transfer from another acute care hospital, including another emergency department
- Patients discharged on day of arrival
- Patients who expired on day of arrival
- Patients who left against medical advice on day of arrival
- Patients with one or more of the following aspirin contraindications/reasons for not prescribing aspirin documented in the medical record:
    - Active bleeding on arrival or within 24 hours after arrival
    - Aspirin allergy
    - Coumadin/warfarin as pre-arrival medication
    - Other reasons documented by a physician, nurse practitioner, or physician assistant for not giving aspirin within 24 hours before or after hospital arrival

Measurement Period Length: Monthly or quarterly; monthly is ideal, but some hospitals might find it easier to measure quarterly if their vendor sends data back at that interval.

Definition of Terms:

- Hospital Arrival: The earliest documented date the patient arrived at the hospital; this may differ from the admission time
- AMI Patients: Discharges with an ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91

Calculate as: (numerator / denominator); as a percentage of AMI patients who received aspirin within 24 hours before or after hospital arrival.

Comments: None

COLLECTION STRATEGY:

Hospitals reporting this measure to JCAHO as a core measure should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation that this intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at
www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record

allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

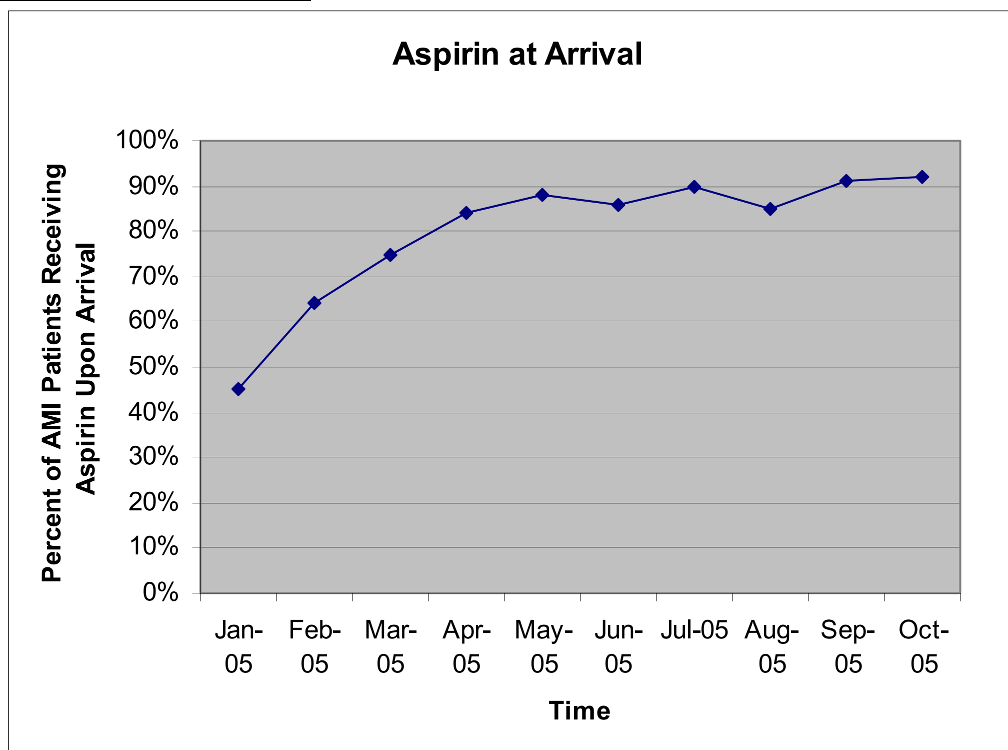
Sampling Strategy:
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
≥ 1556	311
387 - 1555	20% of population size
78 - 386	78
< 78	No sampling; 100% of population required

From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might

contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Aspirin at Arrival
(JCAHO/CMS AMI-1)

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer from #2 from the answer from #1 and enter here. ____

4. What is the total number of patients in #3 above whose admission source was one of the following? ___

   4 - Transfer from a hospital
   The patient was admitted to this facility as a hospital transfer from an acute care facility where he or she was an inpatient

   -OR-

   A - Transfer from a Critical Access Hospital
   The patient was admitted to this facility as a transfer from a Critical Access Hospital where he or she was an inpatient.

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who were transferred to your hospital from another hospital's ED? ____

7. Subtract the answer from #6 from the answer for #5 and enter here. ____

8. What is the total number of patients in #7 above who were admitted to your facility and discharged/expired on the day of admission? _____

9. Subtract the answer from #8 from the answer for #7 and enter here. ____

10. What is the total number of patients in #9 above who had documented contraindications to aspirin on arrival? (see definition in JCAHO Specification Manual for National Hospital Quality Measures (2005))_____

11. Subtract the answer from #10 from the answer to #9 and enter here. ____

    This is the denominator for this measure.

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12. What is the total number of patients in #11 who received aspirin within 24 hours before or after arrival? ____

    This is the numerator for this measure.

Measure Information Form:
Aspirin at Discharge

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: Percentage of acute myocardial infarction (AMI) patients who are prescribed aspirin at hospital discharge

Goal: 100%

Matches Existing Measures:
- JCAHO Core Measure AMI-2
- CMS 7th Scope of Work
- National Quality Forum

CALCULATION DETAILS:

Numerator Definition: AMI patients who are prescribed aspirin at hospital discharge

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

Denominator Exclusions:
- Patients < 18 years of age
- Patients transferred to another acute care hospital
- Patients who expired
- Patients who left against medical advice (AMA)
- Patients discharged to hospice
- Patients with 1 or more of the following aspirin contraindications/reasons for not prescribing aspirin documented in the medical record:
  - Active bleeding on arrival or during hospital stay
  - Aspirin allergy
  - Warfarin/Coumadin prescribed at discharge
    - Other reasons documented by physician, nurse practitioner, or physician assistant for not prescribing aspirin at discharge.

Measurement Period Length: Monthly or quarterly; monthly is ideal, but some hospitals might find it easier to measure quarterly if their vendor sends data back at that interval.

Definition of Terms:

- AMI Patients: Discharges with an ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91

Calculate as: (numerator / denominator); as a percentage of AMI patients who were prescribed aspirin at hospital discharge

Comments: None

COLLECTION STRATEGY:

Hospitals reporting this measure to JCAHO as a core measure should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation that this intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

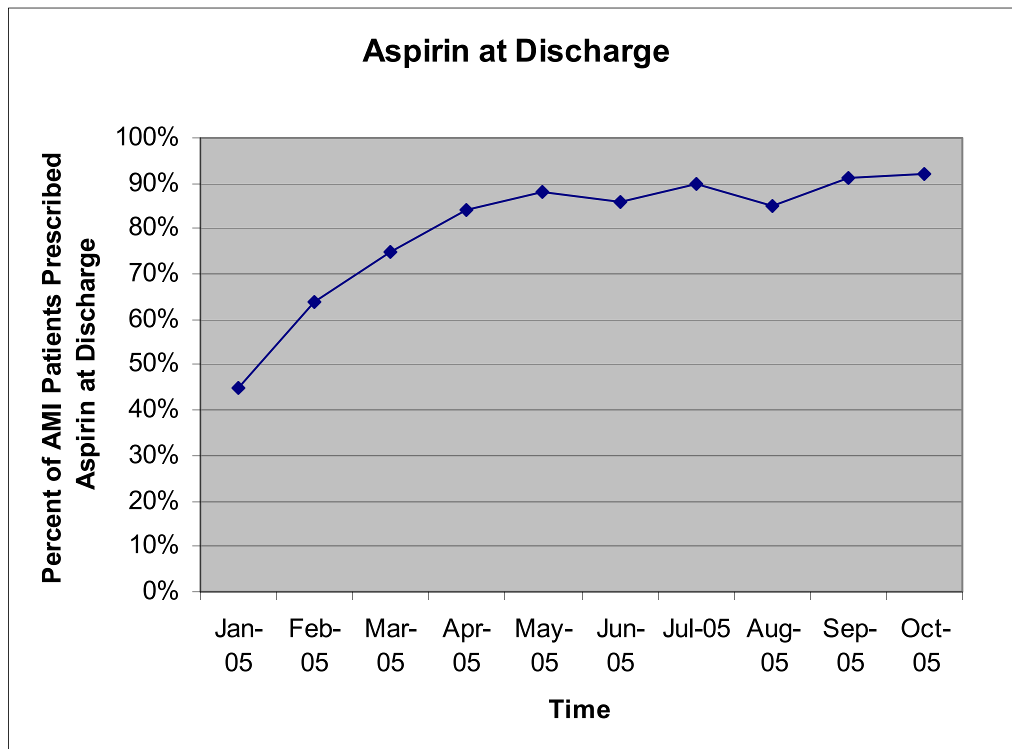
Sampling Strategy:
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
≥ 1556	311
387 - 1555	20% of population size
78 - 386	78
< 78	No sampling; 100% of population required

From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Aspirin at Discharge
(JCAHO/CMS AMI-2)

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer from #2 from the answer from #1 and enter here. ____

4. What is the total number of patients in #3 above whose discharge status was one of the following? ___

   02 - Discharged/transferred to a short term general hospital for inpatient care

   -OR-

   07 – Left against medical advice or discontinued care

   -OR-

   20 - Expired

   -OR-

   41 - Expired in a medical facility (e.g., hospital, SNF, ICF or freestanding hospice) (Usage Note: For use only on Medicare and CHAMPUS [TRICARE] claims for hospice care.)

   -OR-

   43 - Discharged/transferred to a federal health care facility (Usage Note: Discharges and transfers to a government operated health care facility such as a Department of Defense hospital, a Veteran's Administration hospital or a Veteran's Administration nursing facility. To be used whenever the destination at discharge is a federal health care facility, whether the patient resides there or not.)

   -OR-

   50 - Hospice - home

   -OR-

   51 Hospice - medical facility

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who had documented contraindication to aspirin at discharge (as defined in JCAHO Specification Manual for National Hospital Quality Measures (2005))? ____

7. Subtract the answer from #6 from the answer for #5 and enter here. ____

   This is the denominator for this measure.

---

8. What is the total number of patients in #7 who had aspirin prescribed at discharge? ____

   This is the numerator for this measure.

Measure Information Form:
Beta Blocker at Arrival

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: Acute myocardial infarction (AMI) patients without beta blocker contraindications who received a beta blocker within 24 hours after hospital arrival.

Goal: 100%

Matches Existing Measures:
- JCAHO Core Measure AMI-6
- CMS 7th Scope of Work
- National Quality Forum

CALCULATION DETAILS:

Numerator Definition: AMI patients who received a beta blocker within 24 hours after hospital arrival.

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

Denominator Exclusions:
- Patients < 18 years of age
- Patients received in transfer from another hospital, including another emergency department
- Patients transferred to another acute care hospital on day of arrival
- Patients discharged on day of arrival
- Patients who expired on day of arrival
- Patients who left against medical advice (AMA) on day of arrival
- Patients with one or more of the following beta blocker contraindications/reasons for not prescribing beta blocker documented in the medical record
    - Beta blocker allergy
    - Bradycardia (heart rate less than 60 bpm) on arrival or within 24 hours after arrival while not on a beta blocker
    - Heart failure on arrival or within 24 hours after arrival
    - Second or third degree heart block on ECG on arrival or within 24 hours after arrival and does not have a pacemaker
    - Shock on arrival or within 24 hours after arrival

  - Systolic blood pressure less than 90 mm Hg on arrival or within 24 hours after arrival
  - Other reasons documented by a physician, nurse practitioner, or physician assistant for not giving a beta blocker at within 24 hours after hospital arrival

Measurement Period Length: Monthly or quarterly; monthly is ideal, but some hospitals might find it easier to measure quarterly if their vendor sends data back at that interval.

Definition of Terms:

- AMI Patient: Patient with ICD-9-CM principal diagnosis code 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, or 410.91
- Arrival: The earliest documented time the patient arrived at the hospital; this may differ from the admission time

Calculate as: (numerator / denominator); as percent of patients receiving beta blocker at arrival.

Comments: None

COLLECTION STRATEGY:

Hospitals reporting this measure to JCAHO as a core measure should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation that this intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final

identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

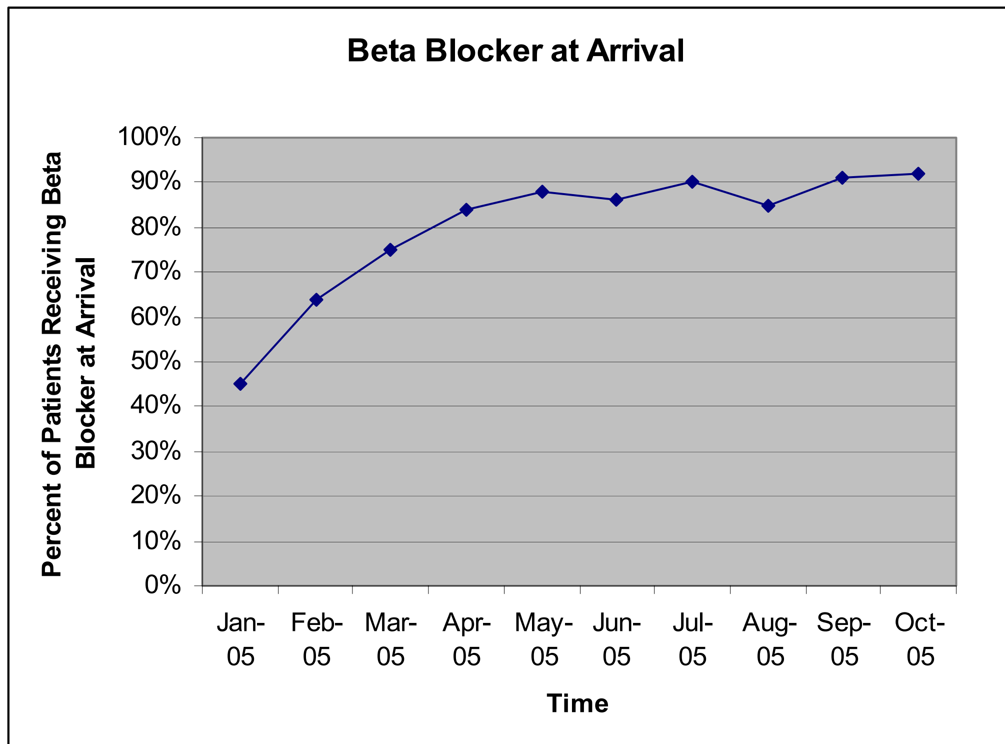
Sampling Strategy:
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
≥ 1556	311
387 - 1555	20% of population size
78 - 386	78
< 78	No sampling; 100% of population required

From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Beta Blocker at Arrival
(JCAHO/CMS AMI-6)

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer from #2 from the answer from #1 and enter here. ____

4. What is the total number of patients in #3 above whose admission source was one of the following? ___

    4 - Transfer from a hospital
    The patient was admitted to this facility as a hospital transfer from an acute care facility where he or she was an inpatient

    -OR-

    A - Transfer from a Critical Access Hospital
    The patient was admitted to this facility as a transfer from a Critical Access Hospital where he or she was an inpatient.

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who were transferred to your hospital from another hospital's ED? ____

7. Subtract the answer from #6 from the answer for #5 and enter here. ____

8. What is the total number of patients in #7 above who were admitted to your facility and discharged/expired on the day of admission? _____

9. Subtract the answer from #8 from the answer for #7 and enter here. ____

10. What is the total number of patients in #9 above who had documented contraindications to beta blocker on arrival? (see definition in JCAHO Specification Manual for National Hospital Quality Measures (2005)) _____

11. Subtract the answer from #10 from the answer to #9 and enter here. ____

    This is the denominator for this measure.

--

12. What is the total number of patients in #11 who received beta blockers within 24 hours before or after arrival? ____

    This is the numerator for this measure.

Measure Information Form:
Beta Blocker Prescribed at Discharge

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: The percentage of AMI patients who are prescribed a beta blocker at hospital discharge

Goal: 100%

Matches Existing Measures:

- JCAHO Core Measure AMI-5
- CMS 7th Scope of Work
- National Quality Forum

CALCULATION DETAILS:

Numerator Definition: AMI patients who are prescribed a beta blocker at hospital discharge

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

Denominator Exclusions:

- Patients < 18 years of age
- Patients transferred to another acute care hospital
- Patients who expired
- Patients who left against medical advice (AMA)
- Patients discharged to hospice
- Patients with one or more of the following beta blocker contraindications/reasons for not prescribing a beta blocker documented in the medical record:
  - Beta blocker allergy
  - Bradycardia (heart rate less than 60 bpm) on day of discharge or day prior to discharge while not on a beta blocker
  - Second or third degree heart block on ECG on arrival or during hospital stay and does not have a pacemaker
  - Systolic blood pressure less than 90 mm Hg on day of discharge or day prior to discharge while not on a beta blocker
  - Other reasons documented by a physician, nurse practitioner, or physician assistant for not prescribing a beta blocker at discharge

Measurement Period Length: Monthly or quarterly; monthly is ideal, but some hospitals might find it easier to measure quarterly if their vendor sends data back at that interval.

Definition of Terms:

- AMI Patients: Discharges with an ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91

Calculate as: (numerator / denominator); as a percentage of AMI patients who were prescribed a beta blocker at hospital discharge

Comments: None

COLLECTION STRATEGY:

Hospitals reporting this measure to JCAHO as a core measure should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation that this intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

Sampling Strategy:

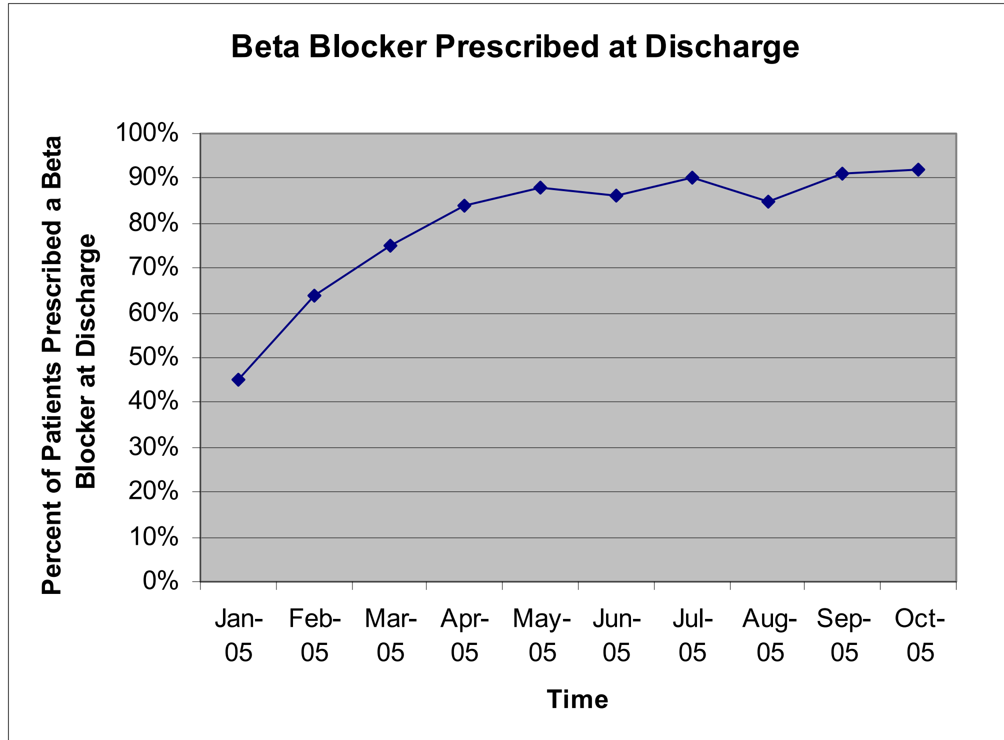
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
$\geq$ 1556	311
387 - 1555	20% of population size
78 - 386	78
< 78	No sampling; 100% of population required

From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Beta Blocker Prescribed at Discharge
(JCAHO/CMS AMI-5)

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer from #2 from the answer from #1 and enter here. ____

4. What is the total number of patients in #3 above whose discharge status was one of the following? ___

   02 - Discharged/transferred to a short term general hospital for inpatient care

   -OR-

   07 – Left against medical advice or discontinued care

   -OR-

   20 - Expired

   -OR-

   41 - Expired in a medical facility (e.g., hospital, SNF, ICF or freestanding hospice) (Usage Note: For use only on Medicare and CHAMPUS [TRICARE] claims for hospice care.)

   -OR-

   43 - Discharged/transferred to a federal health care facility (Usage Note: Discharges and transfers to a government operated health care facility such as a Department of Defense hospital, a Veteran's Administration hospital or a Veteran's Administration nursing facility. To be used whenever the destination at discharge is a federal health care facility, whether the patient resides there or not.)

   -OR-

   50 - Hospice - home

   -OR-

   51 Hospice - medical facility

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who had documented contraindication to beta blocker at discharge (see definition in JCAHO Specification Manual for National Hospital Quality Measures (2005))? ____

7. Subtract the answer from #6 from the answer for #5 and enter here. ____

   This is the denominator for this measure.

---

8. What is the total number of patients in #7 who had beta blocker prescribed at discharge? ____

   This is the numerator for this measure.

Measure Information Form:
Percutaneous Coronary Intervention (PCI) Received Within 120 Minutes of Hospital Arrival

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: Percentage of acute myocardial infarction (AMI) patients receiving percutaneous coronary intervention (PCI) during the hospital stay with a time from hospital arrival to PCI of 120 minutes or less.

Goal: 100%

Matches Existing Measures:
- JCAHO Core Measure AMI-8a
- National Quality Forum

CALCULATION DETAILS:

Numerator Definition: AMI patients with ST elevation or LBBB on ECG who received PCI whose time from hospital arrival to PCI was 120 minutes or less.

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91) with ST elevation or LBBB on ECG who received a PCI

Denominator Exclusions:
- Patients < 18 years of age
- Patients received in transfer from another acute care hospital including another emergency department
- Patients who received thrombolytic agent administration

Measurement Period Length: Monthly or quarterly; monthly is ideal, but some hospitals might find it easier to measure quarterly if their vendor sends data back at that interval.

Definition of Terms:
- AMI patients with ST elevation or LBBB on ECG who received a PCI: Patients discharged with all of the following:
    - *ICD-9-CM Principal Diagnosis Code* for AMI (410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

    AND

    - PCI (*ICD-9-CM Principal and Other Procedure Codes* for PCI as coded 36.01, 36.02, 36.05)

    AND

    - ST segment elevation or LBBB on the ECG performed closest to hospital arrival

    AND

    - PCI performed within 24 hours after hospital arrival
- Arrival: The earliest documented time the patient arrived at the hospital; this may differ from the admission time
- ST segment elevation or LBBB on ECG: See comments below
    - Thrombolytic agent administration: See comments below for data abstraction rules

Calculate as: (numerator / denominator); as percent of patients receiving PCI within 120 minutes of hospital arrival.

Comments:
Use the following rules for abstraction of ST segment elevation or LBBB on ECG:

- Use the 12-lead ECG performed closest to the time of hospital arrival, whether prior to or after hospital arrival (e.g., 12-lead ECG done in the ambulance 10 minutes before hospital arrival and a second one done in the ED 30 minutes after arrival – use the ECG done in the ambulance). If there is no interpretation available from the 12-lead ECG performed closest to the time of hospital, select "No". Do not use an interpretation from another ECG performed that may be available.
- Do NOT use ECGs done more than 1 hour prior to hospital arrival.
- This information must be taken from the interpretation. An ECG interpretation is defined as:
    - A 12-lead ECG report in which the name or initials of the physician/nurse practitioner/physician assistant who reviewed the ECG is signed, stamped, or typed on the report, or
    - Physician/nurse practitioner/physician assistant notation of ECG findings in another source (e.g., progress notes).
- Interpretations must be taken directly from documentation of ECG findings. Do not measure ST segments or attempt to identify a LBBB on the ECG tracing.
- If the ECG report is not specifically labeled "12-lead", infer that it was 12-lead if lead markings (i.e., I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6) are noted on the report.
- If the physician/nurse practitioner/physician assistant references ECG findings but does not specify the ECG was 12-lead, infer that it was 12-lead, unless documentation indicates otherwise.
- If unable to determine which 12-lead ECG was done closest to arrival (e.g., one ECG does not have a time, and it cannot be determined whether it is closer to hospital arrival than another ECG which does have a time), or if the time between the prearrival and post-arrival ECG is the same (e.g., both were done15 minutes from hospital arrival time), select "Yes" if any of these ECGs have ST segment elevation or LBBB documented on the interpretation.

- If the location of an MI is documented and it is described as acute/evolving, or an acute/evolving MI is described as "transmural" or "Q wave", the presumption is being made that it is an ST elevation MI.
- Do not consider "subendocardial" an MI "location" (e.g. "acute subendocardial MI" should be excluded).
- Consider "infarct" synonymous with myocardial infarction (e.g., "acute inferior infarct") should be included.
- MIs MUST be described as **acute or evolving** (in addition to documentation of location or description of MI as "transmural" or "Q wave"). Do NOT include MIs specified as old or previously seen, where the age is documented as undetermined (e.g., "inferior MI age undetermined", "Extensive anterior infarct, age indeterminant", "anterolateral MI on or before 09-01-2004"), or where age is not addressed in any manner (e.g., "Q wave MI"). "New" should not be considered synonymous with "acute". "Evolving" should be considered synonymous with "acute".
- When both an inclusion and exclusion are documented in reference to the same ECG, or documentation is otherwise conflicting, select "No". Consider documentation as conflicting if there is documentation of both an included term and excluded term (per inclusion/exclusion lists or Notes for Abstraction) or documentation of an included term with additional documentation which clearly contradicts the inclusion term. Examples:
    - Signed ECG report lists "LBBB" and "non Q wave MI"
    - The ER physician reports "ST elevation" on the initial ECG, while the attending cardiologist interprets this same ECG as "No ST elevation"
    - Signed ECG report notes ST segment = .05mV, which the physician labels "ST elevation"
- If there is documentation of an included term and documentation of a finding which is not addressed in the inclusion/exclusion lists or Notes for Abstraction, this should NOT be considered conflicting documentation. In the following examples, "Yes" should be selected:
    - Signed ECG report notes "probable lateral injury", while the physician's progress note states "ST elevation present"
    - Findings of "posterior AMI" and "ST depression" are noted on the signed ECG report
- LBBBs described as old should be included. An old LBBB pattern obscures the ability of the ECG to develop recognizable ST elevation, impairing diagnosis of acute MI. Under this uncertainty, these cases should be treated with reperfusion.
- The term "ST abnormality" should not be considered synonymous with "ST elevation".

Use the following rules for abstraction of thrombolytic agent administration:
- In the event the patient was brought to the hospital via ambulance and thrombolytic therapy was infusing at the time of arrival, select "Yes".
- In the event the patient was brought to the hospital via ambulance and thrombolytic therapy was infused during transport but was completed at the time of hospital arrival, select "No".

COLLECTION STRATEGY:

Hospitals reporting this measure to JCAHO as a core measure should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation that this intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at
www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

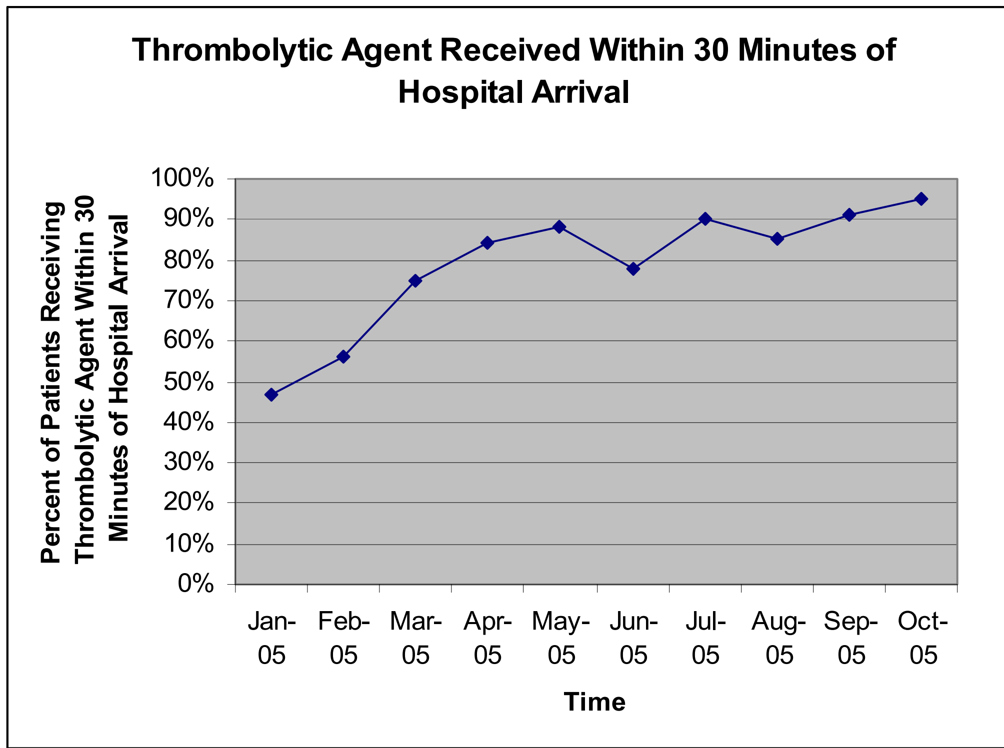
Sampling Strategy:
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
≥ 1556	311
387 - 1555	20% of population size
78 - 386	78
< 78	No sampling; 100% of population required

From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Thrombolytic Agent Received Within 30 Minutes of Hospital Arrival
(JCAHO/CMS AMI-7a)

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer from #2 from the answer from #1 and enter here. ____

4. What is the total number of patients in #3 above whose admission source was one of the following? ___

   4 - Transfer from a hospital
   The patient was admitted to this facility as a hospital transfer from an acute care facility where he or she was an inpatient

   -OR-

   A - Transfer from a Critical Access Hospital
   The patient was admitted to this facility as a transfer from a Critical Access Hospital where he or she was an inpatient.

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who were transferred to your hospital from another hospital's ED? ____

7. Subtract the answer from #6 from the answer for #5 and enter here. ____

8. What is the total number of patients in #7 above whose earliest ECG interpretation did not indicate S-T elevation or left bundle branch block? _____

9. Subtract the answer from #8 from the answer for #7 and enter here. ____

10. What is the total number of patients in #9 above who did not have thrombolytic administration? _____

11. Subtract the answer from #10 from the answer to #9 and enter here. ____

12. What is the total number of patients in #11 above who underwent thrombolysis more than 360 minutes after arrival time? ____

13. Subtract the answer to #12 above from the answer to #11 above and enter here.___

    This is the denominator for this measure.

--

14. What is the total number of patients in #13 who received thrombolysis in less than our equal to 30 minutes from arrival? ____

    This is the numerator for this measure.

Measure Information Form:
Perfect Care for AMI

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: Percentage of acute myocardial infarction (AMI) patients who received all 7 appropriate AMI evidence-based elements.

Goal: $\geq$ 95%

Matches Existing Measures: None

CALCULATION DETAILS:

Numerator Definition: AMI patient who either received **all** of the following elements or had documentation of a contraindication:

- Early administration of aspirin
- Aspirin at discharge
- Early administration of beta blocker
- Beta blocker at discharge
- ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge
- Timely administration of thrombolytics **or** percutaneous coronary intervention (PCI)
- Smoking cessation counseling

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

Denominator Exclusions:

- Patients < 18 years of age
- Patients discharged to hospice
- Death in the emergency department

Measurement Period Length: Monthly

Definition of Terms:

- AMI patients: Patients with ICD-9-CM Principal Diagnosis Code for AMI (410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

Calculate as: (numerator / denominator); as percentage of AMI patients receiving perfect care: all components provided or documented as contraindicated

Comments:
Perfect care for AMI is defined as provision of all 7 of the key elements, or documentation of clear contraindication. Patients are only counted as having received "perfect care" if all interventions are documented as given in appropriate time frames, or that clear contraindications existed. If documentation for any one item is missing, the patient is not considered as having received "perfect care". When reporting this as a percentage, only those patients with documentation of perfect care are counted in the numerator.

Hospitals that do not provide all 7 elements should calculate this based on those elements which are provided. For example, a rural hospital may only provide initial stabilization prior to transferring the AMI patient to a tertiary care center. In such cases, only 2 of the elements (aspirin and Beta blocker on arrival) might be provided prior to transfer. The definition of perfect care would be the percent of patients who received all appropriate elements prior to transfer.

Transfer patients should still receive all of the key elements for AMI care. Both the sending and receiving hospitals should work together to ensure that this occurs. Hospitals that receive AMI patients in transfer should base the percent of perfect care on all 7 elements, even if some are provided prior to arrival by the sending hospital. The goal is to focus on what the patient *received* since all AMI should expect to receive perfect care, even when they must be transferred.

COLLECTION STRATEGY:

Hospitals reporting AMI data to JCAHO as part of their core measures should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation as to whether all of the recommended interventions were either provided or contraindicated. If the individual measures are being collected during this review, the data needed to calculate this measure is the same. The only difference in this measure is that if documentation for every intervention (provision or contraindication) cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at
www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

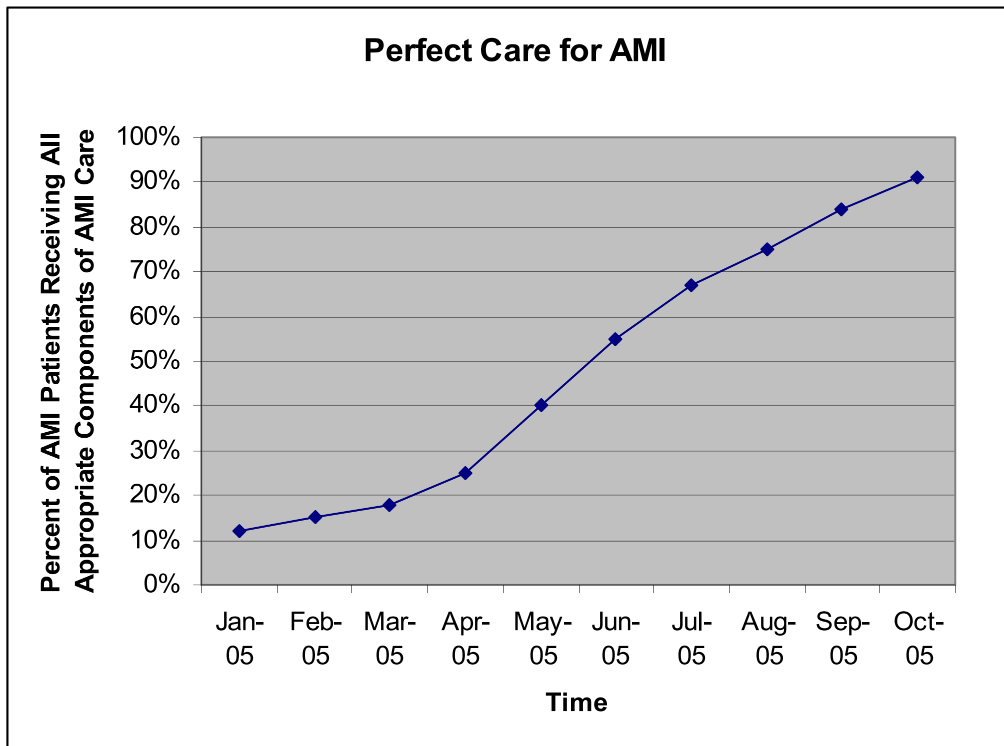
Sampling Strategy:
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
≥ 1556	311
387 - 1555	20% of population size
78 - 386	78
< 78	No sampling; 100% of population required

From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Perfect Care for AMI

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer to #2 from the answer to #1 and enter here. ____

4. What is the total number of patients in #3 above whose admission source was one of the following? ___

    4 - Transfer from a hospital
    The patient was admitted to this facility as a hospital transfer from an acute care facility where he or she was an inpatient

    -OR-

    A - Transfer from a Critical Access Hospital
    The patient was admitted to this facility as a transfer from a Critical Access Hospital where he or she was an inpatient.

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who were transferred to your hospital from another hospital's ED? ____

7. Subtract the answer to #6 from the answer to #5 and enter here. ____

8. What is the total number of patients in #7 above whose discharge status was one of the following? ___

    02 - Discharged/transferred to a short term general hospital for inpatient care

    -OR-

    07 – Left against medical advice or discontinued care

    -OR-

    20 - Expired

    -OR-

41 - Expired in a medical facility (e.g., hospital, SNF, ICF or freestanding hospice) (Usage Note: For use only on Medicare and CHAMPUS [TRICARE] claims for hospice care.)

-OR-

43 - Discharged/transferred to a federal health care facility (Usage Note: Discharges and transfers to a government operated health care facility such as a Department of Defense hospital, a Veteran's Administration hospital or a Veteran's Administration nursing facility. To be used whenever the destination at discharge is a federal health care facility, whether the patient resides there or not.)

-OR-

50 - Hospice - home

-OR-

51 Hospice - medical facility

9. Subtract the answer to #8 above from the answer to #7 above and enter here. ___

This is the denominator for this measure.

--

10. What is the total number of patients in #9 who received **<u>all</u>** of the following components or had documentation of a contraindication? ____

This is the numerator for this measure.

Aspirin at arrival (as derived from Measure Worksheet ___)

-AND-

Aspirin at discharge (as derived from Measure Worksheet ___)

-AND-

Beta blocker at arrival (as derived from Measure Worksheet ____)

-AND-

Beta blocker at discharge (as derived from Measure Worksheet ___)

-AND-

ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge (as derived from Measure Worksheet ___)

-AND-

Thrombolytic agent received within 30 minutes of hospital arrival (as derived from Measure Worksheet ___)

- OR -

Percutaneous coronary intervention (PCI) received within 120 minutes of hospital arrival (as derived from Measure Worksheet ___)

-AND-

Adult smoking cessation advice/counseling (as derived from Measure Worksheet ___)

Measure Information Form:
Adult Smoking Cessation Advice/Counseling

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: AMI patients who receive smoking cessation advice or counseling during hospital stay

Goal: 100%

Matches Existing Measures:
- JCAHO Core Measure AMI-4
- CMS 7th Scope of Work
- National Quality Forum

CALCULATION DETAILS:

Numerator Definition: AMI patients (cigarette smokers) who receive smoking cessation advice or counseling during the hospital stay

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91) with a history of smoking cigarettes anytime during the year prior to hospital arrival

Denominator Exclusions:
- Patients < 18 years of age
- Patients transferred to another acute care hospital
- Patients who expired
- Patients who left against medical advice (AMA)
- Patients discharged to hospice

Measurement Period Length: Monthly or quarterly; monthly is ideal, but some hospitals might find it easier to measure quarterly if their vendor sends data back at that interval.

Definition of Terms:
- AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

Calculate as: (numerator / denominator); as a percentage of AMI patient (cigarette smokers) who received smoking cessation or counseling during the hospital stay

Comments:

COLLECTION STRATEGY:

Hospitals reporting this measure to JCAHO as a core measure should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation that this intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at
www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

Sampling Strategy:
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

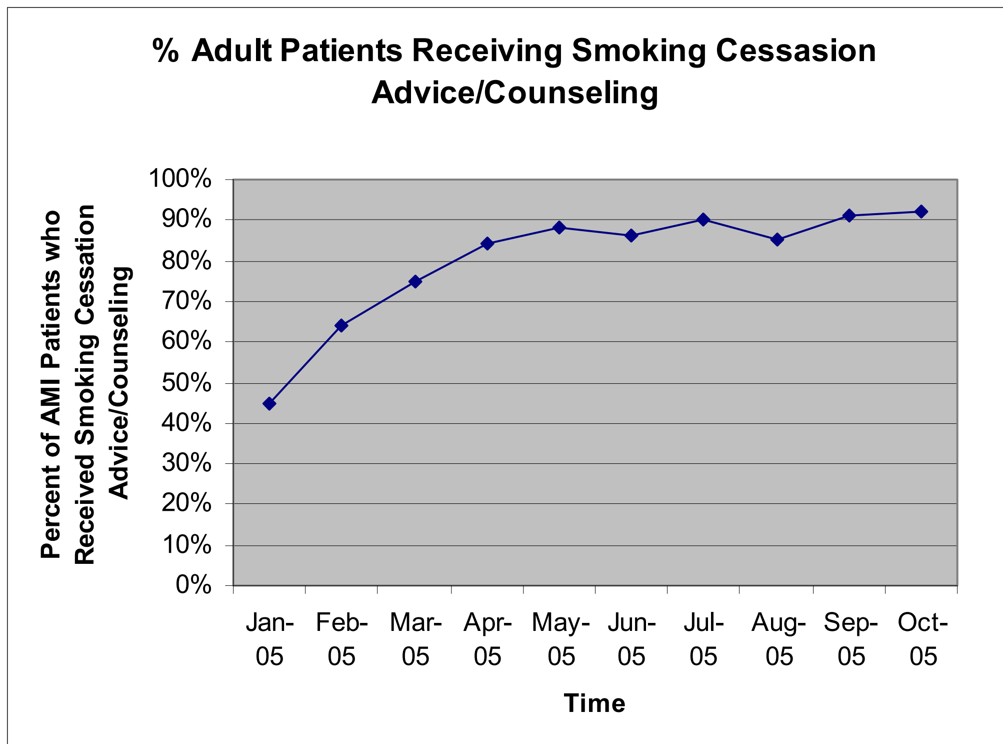
Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
≥ 1556	311
387 - 1555	20% of population size
78 - 386	78

< 78	No sampling; 100% of population required

From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Adult Smoking Cessation Advice/Counseling
(JCAHO/CMS AMI-4)

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer from #2 from the answer from #1 and enter here. ____

4. What is the total number of patients in #3 above whose discharge status was one of the following? ___

   02 - Discharged/transferred to a short term general hospital for inpatient care

   -OR-

   07 – Left against medical advice or discontinued care

   -OR-

   20 - Expired

   -OR-

   41 - Expired in a medical facility (e.g., hospital, SNF, ICF or freestanding hospice) (Usage Note: For use only on Medicare and CHAMPUS [TRICARE] claims for hospice care.)

   -OR-

   43 - Discharged/transferred to a federal health care facility (Usage Note: Discharges and transfers to a government operated health care facility such as a Department of Defense hospital, a Veteran's Administration hospital or a Veteran's Administration nursing facility. To be used whenever the destination at discharge is a federal health care facility, whether the patient resides there or not.)

   -OR-

   50 - Hospice - home

   -OR-

   51 Hospice - medical facility

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who had not smoked cigarettes anytime during the year prior to hospital arrival? ____

7. Subtract the answer from #6 from the answer for #5 and enter here. ____

   This is the denominator for this measure.

--

8. What is the total number of patients in #7 who received smoking counseling? ____

   This is the numerator for this measure.

Measure Information Form:
Thrombolytic Agent Received Within 30 Minutes of Hospital Arrival

Intervention(s): Improved Care for Acute Myocardial Infarction

Definition: Percentage of acute myocardial infarction (AMI) patients receiving thrombolytic therapy during the hospital stay and having a time from hospital arrival to thrombolysis of 30 minutes or less.

Goal: 100%

Matches Existing Measures:
- JCAHO Core Measure AMI-7a
- CMS 7th Scope of Work
- National Quality Forum

CALCULATION DETAILS:

Numerator Definition: AMI patients with ST elevation or LBBB on ECG who received thrombolytic therapy whose time from hospital arrival to thrombolysis is 30 minutes or less.

Numerator Exclusions: Same as denominator exclusions

Denominator Definition: AMI patients (ICD-9-CM Principal Diagnosis Code: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91) with ST elevation or LBBB on ECG who received thrombolytic therapy

Denominator Exclusions:
- Patients < 18 years of age
- Patients received in transfer from another acute care hospital including another emergency department

Measurement Period Length: Monthly or quarterly; monthly is ideal, but some hospitals might find it easier to measure quarterly if their vendor sends data back at that interval.

Definition of Terms:
- AMI patients with ST elevation or LBBB on ECG who received thrombolytic therapy: Patients discharged with all of the following:
  - *ICD-9-CM Principal Diagnosis Code* for AMI (410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91)

    AND

    - ST segment elevation or LBBB on the ECG performed closest to hospital arrival

    AND

    - Thrombolytic therapy within 6 hours after hospital arrival
- Arrival: The earliest documented time the patient arrived at the hospital; this may differ from the admission time
- ST segment elevation or LBBB on ECG: See comments below

Calculate as: (numerator / denominator); as percent of AMI patients receiving thrombolytic agent who received it within 30 minutes of arrival.

Comments:
Use the following rules for abstraction of ST segment elevation or LBBB on ECG:

- Use the 12-lead ECG performed closest to the time of hospital arrival, whether prior to or after hospital arrival (e.g., 12-lead ECG done in the ambulance 10 minutes before hospital arrival and a second one done in the ED 30 minutes after arrival – use the ECG done in the ambulance). If there is no interpretation available from the 12-lead ECG performed closest to the time of hospital, select "No". Do not use an interpretation from another ECG performed that may be available.
- Do NOT use ECGs done more than 1 hour prior to hospital arrival.
- This information must be taken from the interpretation. An ECG interpretation is defined as:
    - A 12-lead ECG report in which the name or initials of the physician/nurse practitioner/physician assistant who reviewed the ECG is signed, stamped, or typed on the report, or
    - Physician/nurse practitioner/physician assistant notation of ECG findings in another source (e.g., progress notes).
- Interpretations must be taken directly from documentation of ECG findings. Do not measure ST segments or attempt to identify a LBBB on the ECG tracing.
- If the ECG report is not specifically labeled "12-lead", infer that it was 12-lead if lead markings (i.e., I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6) are noted on the report.
- If the physician/nurse practitioner/physician assistant references ECG findings but does not specify the ECG was 12-lead, infer that it was 12-lead, unless documentation indicates otherwise.
- If unable to determine which 12-lead ECG was done closest to arrival (e.g., one ECG does not have a time, and it cannot be determined whether it is closer to hospital arrival than another ECG which does have a time), or if the time between the prearrival and post-arrival ECG is the same (e.g., both were done15 minutes from hospital arrival time), select "Yes" if any of these ECGs have ST segment elevation or LBBB documented on the interpretation.
- If the location of an MI is documented and it is described as acute/evolving, or an acute/evolving MI is described as "transmural" or "Q wave", the presumption is being made that it is an ST elevation MI.
- Do not consider "subendocardial" an MI "location" (e.g. "acute subendocardial MI" should be excluded).
- Consider "infarct" synonymous with myocardial infarction (e.g., "acute inferior infarct") should be included.

- MIs MUST be described as **acute or evolving** (in addition to documentation of location or description of MI as "transmural" or "Q wave"). Do NOT include MIs specified as old or previously seen, where the age is documented as undetermined (e.g., "inferior MI age undetermined", "Extensive anterior infarct, age indeterminant", "anterolateral MI on or before 09-01-2004"), or where age is not addressed in any manner (e.g., "Q wave MI"). "New" should not be considered synonymous with "acute". "Evolving" should be considered synonymous with "acute".
- When both an inclusion and exclusion are documented in reference to the same ECG, or documentation is otherwise conflicting, select "No". Consider documentation as conflicting if there is documentation of both an included term and excluded term (per inclusion/exclusion lists or Notes for Abstraction) or documentation of an included term with additional documentation which clearly contradicts the inclusion term. Examples:
    - Signed ECG report lists "LBBB" and "non Q wave MI"
    - The ER physician reports "ST elevation" on the initial ECG, while the attending cardiologist interprets this same ECG as "No ST elevation"
    - Signed ECG report notes ST segment = .05mV, which the physician labels "ST elevation"
- If there is documentation of an included term and documentation of a finding which is not addressed in the inclusion/exclusion lists or Notes for Abstraction, this should NOT be considered conflicting documentation. In the following examples, "Yes" should be selected:
    - Signed ECG report notes "probable lateral injury", while the physician's progress note states "ST elevation present"
    - Findings of "posterior AMI" and "ST depression" are noted on the signed ECG report
- LBBBs described as old should be included. An old LBBB pattern obscures the ability of the ECG to develop recognizable ST elevation, impairing diagnosis of acute MI. Under this uncertainty, these cases should be treated with reperfusion.
- The term "ST abnormality" should not be considered synonymous with "ST elevation".

COLLECTION STRATEGY:

Hospitals reporting this measure to JCAHO as a core measure should already have an approved vendor that is identifying the patients through the algorithm which applies the inclusion and exclusion criteria. After the patients have been identified, manual review of the medical record will be required to look for documentation that this intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

For hospitals that are not using a vendor approved by JCAHO to identify patients, the patients should be identified utilizing the same algorithm, inclusion and exclusion criteria. The algorithm can be downloaded from the JCAHO website at
www.jcaho.org/pms/core+measures/2aamilist.pdf

The primary sources for identifying patients are based on required data elements in administrative data and medical records. A hospital information system may be able to identify

the patients from all discharges by sorting based on these elements. Another alternative is to work with the coding or medical records department to identify the patients at the time of coding and prepare a list or set aside records for review. Manual review of the records will be required as described above.

Concurrent review has been used by some hospitals to collect data while patients are still in the hospital and also allows for the identification of missed interventions so that mitigation can occur before discharge. One example of this approach is identification of AMI patients in the emergency department. As soon as the patient is diagnosed or identified as possible AMI, a data collection sheet is placed on the record. Throughout the course of the hospital stay, hospital staff check for the interventions and document each as it is either complicated or identified as contraindicated. The data collection sheet remains in the medical record after discharge. Final identification of patients who meet the measure definition must still be made after discharge and coding using the algorithm. However, data for most patients will already be in the medical record allowing for quick collection and negating the need for a retrospective review. Any cases missed and not identified until after discharge will require a manual retrospective review.

Sampling Strategy:
Hospitals may decide to collect data using sampling if there is a sufficient volume of cases. The following sampling guidelines from JCAHO Core Measures may be useful:

Sample Size Based on Population Size for AMI

Average Quarterly Population Size *"N"*	Minimum required sample *"n"*
≥ 1556	311
387 - 1555	20% of population size
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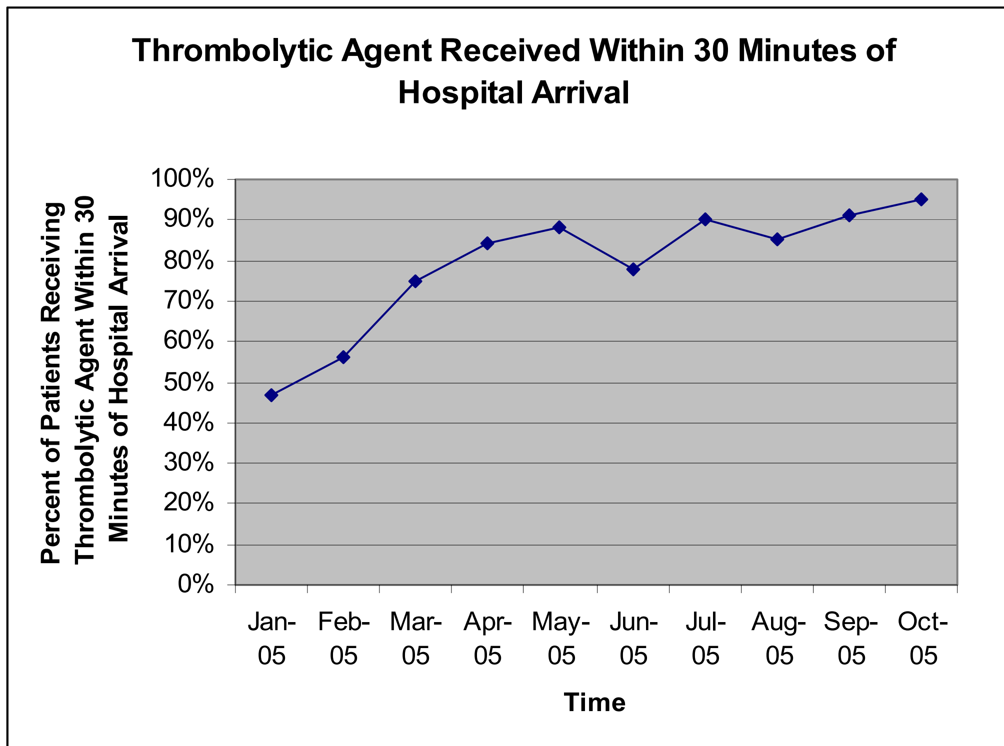
From JCAHO Specification Manual for National Hospital Quality Measures 2005

SAMPLE GRAPH:



DATA COLLECTION AND ANALYSIS TOOLS:

Alamance Regional Medical Center (Burlington, NC) uses a form to collect data on some components of AMI care concurrently. The form is included as a sample of what one might contain (see Appendix A). Your organization should develop a form that meets your data collection needs and may contain options for collecting additional data on other components

Measure Rate Worksheet
Thrombolytic Agent Received Within 30 Minutes of Hospital Arrival
(JCAHO/CMS AMI-7a)

1. What is the total number of patients in the previous month whose principal diagnosis is on Table 1.1 in Appendix A of the JCAHO Specification Manual for National Hospital Quality Measures (2005)? ______

2. What is the total number of patients in #1 above whose age was < 18 years on admission? ____

3. Subtract the answer from #2 from the answer from #1 and enter here. ____

4. What is the total number of patients in #3 above whose admission source was one of the following? ___

   4 - Transfer from a hospital
   The patient was admitted to this facility as a hospital transfer from an acute care facility where he or she was an inpatient

   -OR-

   A - Transfer from a Critical Access Hospital
   The patient was admitted to this facility as a transfer from a Critical Access Hospital where he or she was an inpatient.

5. Subtract the answer from #4 from the answer for #3 and enter here. ____

6. What is the total number of patients in #5 above who were transferred to your hospital from another hospital's ED? ____

7. Subtract the answer from #6 from the answer for #5 and enter here. ____

8. What is the total number of patients in #7 above whose earliest ECG interpretation did not indicate S-T elevation or left bundle branch block? _____

9. Subtract the answer from #8 from the answer for #7 and enter here. ____

10. What is the total number of patients in #9 above who did not have thrombolytic administration? _____

11. Subtract the answer from #10 from the answer to #9 and enter here. ____

12. What is the total number of patients in #11 above who underwent thrombolysis more than 360 minutes after arrival time? ____

13. Subtract the answer to #12 above from the answer to #11 above and enter here.___

    This is the denominator for this measure.

--

14. What is the total number of patients in #13 who received thrombolysis in less than our equal to 30 minutes from arrival? ____

    This is the numerator for this measure.