



# Getting Started Kit: Improved Care for Acute Myocardial Infarction How-to Guide

## *Safer Healthcare Now!*

We invite you to join the *Safer Healthcare Now!* Campaign (SHN) to help improve the safety of the Canadian healthcare system. *Safer Healthcare Now!* is a National campaign supporting Canadian healthcare organizations to improve patient safety by using quality improvement methods to integrate evidence and best practices in patient care delivery. The campaign is supported by the Institute for Healthcare Improvement (IHI) and is patterned after IHI's *100,000 Lives Campaign* (now 5 million lives campaign). To join the SHN! Campaign, obtain further information about resources, contacts, and tools, visit our website <http://www.saferhealthcarenow.ca>

Patient safety interventions are organized as bundles and described in Getting Started Kits, based on those originally developed by IHI for its *100,000 Lives Campaign* (now 5 million lives campaign). These kits are designed to engage your teams and clinicians in a dynamic approach for quality improvement, and to provide a thorough basis for *getting started*. **Please note that although the SHN kits and the original kits developed by IHI are similar, there are also key differences in the content of the interventions and corresponding measures for some kits.** These differences are clearly noted in the body of the SHN kits themselves, and on the SHN website.

The "Getting Started" kits are based on the current state of knowledge. Consistent with the dynamic nature of this campaign, which continues to evolve, emerging evidence may influence adaptation of the kits in the future. This kit was reviewed and updated in January 2007. We remain open to working consultatively on updating the content as together we make healthcare safer in Canada.

### Note:

*The Quebec Campaign: Together, let's improve healthcare safety! works collaboratively with the SHN Campaign. The GSKs for all six targeted interventions used in both campaigns are the same and the leader for the Quebec Campaign is a member of the SHN National Steering Committee.*

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## **Acknowledgement**

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In addition, we also wish to thank and acknowledge our Canadian faculty who has contributed significantly to the work of the AMI teams and the revisions to this kit.

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## **Background**

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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 of the actual event in the heart (e.g., inferior wall vs. anterior wall) or the type of changes seen on an electrocardiogram (ST elevation or non-ST elevation).

A physician considers 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 *Safer Healthcare Now! Campaign* (SHN), 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, several million people in the United States and Canada are diagnosed with an AMI, and approximately one third of these patients die during the acute phase. The American College of Cardiology (ACC), the American Heart Association (AHA), the Canadian Cardiovascular Society and the Canadian Cardiovascular Outcomes Research Team (CCORT) 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. When implemented in a consistent and reliable manner, these interventions have decreased AMI morbidity and mortality in hospitals. 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) in the US and the Canadian Council on Health Services Accreditation (CCHSA) in Canada have both identified patient safety as a key area for improvement and adoption of evidence – based practice . Health Canada has identified cardiovascular disease or heart diseases as the number one killer in Canada. It is also the most costly disease in Canada, putting the greatest burden on our national healthcare system.

Canadian Council on Health Services Accreditation (CCHSA). AIM: Achieving Improved Measurement. CCHSA Accreditation Program, 3rd addition, 2004.

Health Canada:

Heart and Stroke webpage: [http://www.hc-sc.gc.ca/dc-ma/heart-coeur/index\\_e.html](http://www.hc-sc.gc.ca/dc-ma/heart-coeur/index_e.html)

Economic Burden of Illness in Canada 1998 webpage: <http://www.phac-aspc.gc.ca/publicat/ebic-femc98/>

## Improved Care for AMI: Components of Care

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### ***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 hospitalization and post-discharge may vary based on clinical condition and other co-morbidities. There is strong evidence in the literature to support that the following seven key care components should be provided to all AMI patients:

#### ***SHN AMI Care Components– 2005-2006***

- Early administration of aspirin
- Aspirin at discharge
- Beta-blocker at discharge
- Timely initiation of reperfusion (thrombolysis or percutaneous intervention)
- ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for patients with systolic dysfunction
- Smoking cessation counselling / nicotine replacement / serotonin uptake inhibitor / referral to cardiac rehabilitation program. It is noted that smoking cessation counselling may be a component of cardiac rehabilitation or provided elsewhere. At discharge it is recommended that all AMI patients be referred to a formal cardiac rehabilitation program or an appropriate medical ambulatory clinic which integrates cardiac rehabilitation care. The measure for the Canadian SHN! Campaign is the percentage of AMI patients who receive smoking cessation advice, counselling and/or pharmacologic therapy and/or referral to a cardiac rehabilitation program during hospital stay. (See Canadian Cardiovascular Society website: [www.ccs.ca](http://www.ccs.ca)) Smoking cessation tools are available in **Appendix D**.

#### ***Added to the SHN AMI Care Components – 2007***

- Statins at discharge (**NEW!**)

In the Fall of 2006, Canadian cardiologists and experts were consulted in revising the Canadian version of this kit and agreed that the evidence supported adding “*Statins at discharge*” to the six previously approved care components. Furthermore, they agreed that these seven (7) care components should be provided to all patients with an AMI, unless a clear contraindication exists and is documented in the medical record.

In the *IHI 100K Lives Campaign* (now 5 million lives campaign), the early administration of beta-blockers has been included as a key care component by the American College of Cardiology in their recommended guidelines for AMI care. However, based on the new evidence from the COMMIT/CCS-2 Study Trial, many Canadian cardiologists explicitly caution that the broad, early use of beta-blockers may not be in the patient’s best interest and have not endorsed this care component in the AMI guidelines and therefore, is not included in the *Safer Healthcare Now!* AMI elements.

Second Chinese Cardiac Study (CCS-2) Collaborative Group. COMMIT CCS-2 (Clopido<sup>g</sup>rel and Metoprolol in Myocardial Infarction Trial). Slide presentations at the annual conference of the American College of Cardiology in Orlando, March 9, 2005. <http://www.ctsu.ox.ac.uk/~ccs2/live/content/presentations/slideshow/>

## **Potential Impact**

Many references in the literature—far more than can be summarized here—demonstrate the effectiveness of the 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;268:240-247.

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;335:1660-1666.

In acute MI, it may be better to start beta-blockers when the patient is stable (and then continue long term). Results from the COMMIT-CCS-2 trial indicated that for patients receiving metoprolol treatment, the risk of cardiogenic shock increased by 11 per 1000 ( $p < 0.00001$ ) on days 0-1. When in doubt, it is wise to use beta blockers in a tertiary centre. Emerging evidence will be reviewed by experts in Canadian and US rosters as the *Safer Healthcare Now!* Campaign unfolds.

COMMIT CCS-2 website: [www.COMMIT-CCS2.org](http://www.COMMIT-CCS2.org)

## **The Gap between Reliable, Evidence-Based AMI Care and Actual Care**

Researchers have studied whether evidence-based care components are provided to patients by reviewing their health records for documentation of care. Despite the evidence demonstrating the effectiveness of these care components, many patient health 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.

A review of post-AMI care in four Canadian provinces revealed that although utilization rates for beta-blockers, ACE inhibitors and statins increased over the study period, the rates were still far below optimal levels (Pilote, Beck et al., 2004). Similar results have been found in Saskatchewan (Chan, Brossart et al., 2004).

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;348:2635-2644.

Pilote L, Beck CA, Karp I, Alter D, Austin P, Cox J, Humphries K, Jackevicius C, Richard H, Tu JV; Canadian Cardiovascular Outcomes Research Team. Secondary prevention after acute myocardial infarction in four Canadian provinces, 1997-2000. *Canadian Journal of Cardiology* 2004 Jan;20(1):61-67.

Chan BTB, Brossart BD, Hudema NRL, Stevenson K, Walling E, Basky G, Xie H. *Improving the Quality of Heart Attack Care in Saskatchewan: Outcomes and Secondary Prevention*. Saskatoon: Health Quality Council, September 2004. (Available at [www.hqc.sk.ca](http://www.hqc.sk.ca))

It is important to note that the results of these analyses are contingent on the quality of the clinical documentation in the patient record. The capture of data related to these key AMI care components may be invalid and unreliable if not accurately documented and actual practice may be better than your results demonstrate as a result of poor documentation. Canadian and provincial rates of use of evidence-based medications for the treatment of AMI have increased over time, although there remains room for improvement. (Jackevicius CA, Alter D, Cox J, et al. Acute treatment of myocardial infarction in Canada 1999-2002. *Can J Cardiol.* 2005 Feb;21(2):145-52.)

### ***Examples of Success***

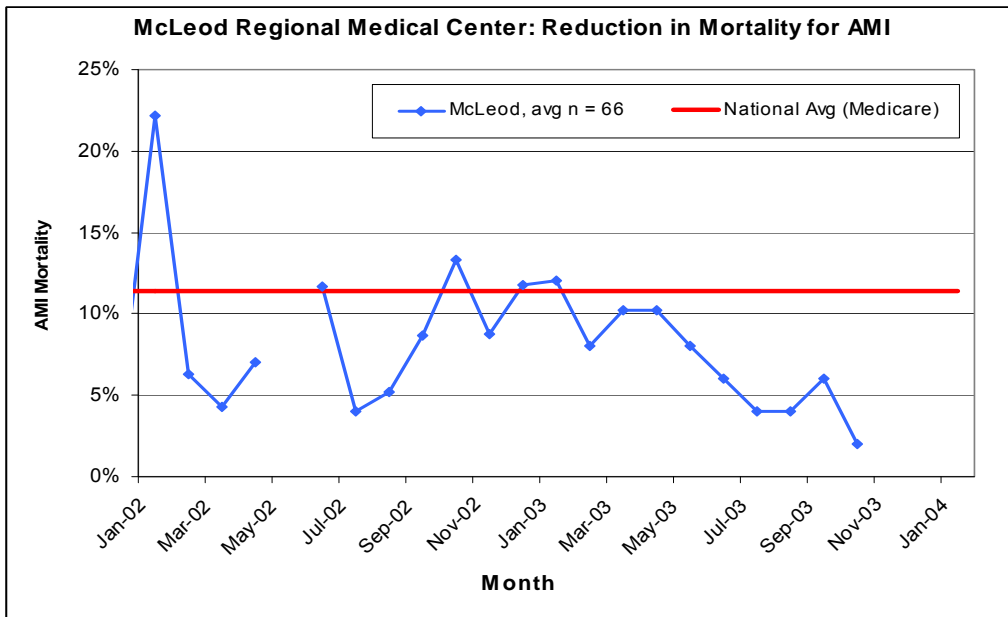
A few hospitals have reported significant improvement in applying evidence-based AMI care, using a variety of approaches. For example, Intermountain Health Care (Salt Lake City, Utah) implemented a discharge medication program including key AMI care components, contributing to greater than 90 percent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

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 key components of care, or documentation of clear contraindication. Patients are only counted as having received “perfect care” if all 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.



## **Implementing the Seven Components of AMI Care**

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### ***Forming the Team and Setting Your Aim***

Before starting any improvement work, it is always wise to establish the aim of the work. The aim is to improve AMI care and save lives by reducing AMI mortality within a year.

A team should develop its own aim. From the list of care components for AMI, determine the key stakeholders in your organization who have essential roles in ensuring that patients receive the care components and engage them as team members. Consideration should be given to establishing teams with co-leaders which may be a clinical manager and a physician champion. 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
- Family Practice / Internal Medicine Physicians
- Cardiac Care Nurses (frontline)
- Nursing Clinical Coordinator or Educator
- Case Manager
- Pharmacy Representative
- Quality Improvement Representative
- Cath Lab Representative
- Sites involved in any aspect of AMI care within larger health districts (or establish another team)

A sample aim statement might be:

- Reduce inpatient AMI mortality by 25% by implementing all evidence-based care components by December 2007

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 understand, feel ownership and use it to guide their work. Although the aim statement will be based on the same clinical standards, it is important to customize the aim to fit the uniqueness of the practice context and provider group. The aim represents what your team and your organization is committed to work towards achieving. If your organization is enrolled in the *Safer Healthcare Now! 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 aspect of care. In addition to involving people directly in the QI Team, a comprehensive communication strategy should be developed with key messages and defined stakeholders.

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 and may benefit from use of sub teams, as follows:

**Sub Team A**

***Early administration of aspirin 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 Registered Nurses.

**Sub Team B**

***Prescription of ASA, Beta blockers, ACE Inhibitor or ARB, smoking cessation counselling and now statins at discharge. These*** care components occur later in the hospital stay but prior to discharge. The second sub team could include key staff from a cardiac rehabilitation team or a medical floor which would allow them to address explicit needs when patients are referred and/or treated in their area.

The use of sub teams is an efficient way to obtain relevant input and support from clinicians. 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, the *Safer Healthcare Now!* Campaign and 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:

Part One:

- 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.

Part Two:

- The Plan-Do-Study-Act (PDSA) cycle to conduct small-scale tests of change in real work settings — by:
  - 1) planning a test,
  - 2) trying it,
  - 3) observing the results, and
  - 4) acting on what is learned.

This is the scientific method, used for action-oriented learning. Ideas should be sought from the front-line and tested in small and practical ways, with a few nurses and/or a few patients at a time. Many resources are available at [www.saferhealthcarenow.ca](http://www.saferhealthcarenow.ca) in the QIM Community of Practice.

Implementation: After testing a change on a small scale, learning from the test, and refining the change through several PDSA cycles, the team can implement the change on a broader scale. The broader scale may include an entire pilot population or 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](http://www.IHI.org) and on the national Safer Healthcare Now! Website [www.saferhealthcarenow.ca](http://www.saferhealthcarenow.ca) in the QIM and AMI Communities of Practice. Contact your Node Leader or Safety Improvement Advisor (SIA) if your team is seeking additional educational support or looking for information on the key ingredients for a good spread plan.

### ***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.

#### Example

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

Change: Tape ASA to triage sheet for those with chest pain.

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.
3. Document ASA given to patient.
4. Huddle with immediate team to discuss (Emergency physician, nurse)

### ***Process Measures for AMI***

Compliance with each of the seven (7) key components of evidence-based AMI care for the SHN campaign can easily be measured. Documentation that each care component 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 (7) measures. (See **Appendix A** for the technical descriptions and worksheets for each of the following measures.)

The seven process measures consist of the following:

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. Beta-blocker at discharge  
*Percent of AMI patients prescribed beta-blocker at discharge.*
4. 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 90 minutes of hospital arrival.*

This PCI time differs from IHI's measure for its *100K Lives Campaign (now 5 million lives campaign)*, which is defined as 120 minutes or less, but is consistent with the revised ACC/AHA Guidelines for Percutaneous Coronary Intervention, and a recent paper of the Canadian Cardiovascular Society Working Group in response to these guidelines.

Smith et al. ACC/AHA Guidelines for Percutaneous Coronary Intervention (Revision of the 1993 PTCA Guidelines). A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1993 Guidelines for Percutaneous Transluminal Coronary Angioplasty). *JACC* June 2001 37(8):2239i-ixvi [Downloaded from: [http://www.acc.org/clinical/guidelines/percutaneous/percutaneous\\_V.htm](http://www.acc.org/clinical/guidelines/percutaneous/percutaneous_V.htm)]

Armstrong PW, Buller CE, Dorian P, O'Neill B. *The 2004 ACC/AHA Guidelines: A Perspective and Adaptation for Canada by the Canadian Cardiovascular Society Working Group.* [Downloaded from: <http://www.ccs.ca>]

5. ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for patients with systolic dysfunction  
*Percent of AMI patients who were prescribed ACEI or ARB at discharge*
6. Smoking cessation counselling / nicotine replacement / serotonin reuptake inhibitor / referral to cardiac rehabilitation program.  
*Percent of AMI patients (cigarette, cigar and pipe smokers) who received smoking cessation advice, counselling and/or cardiac rehabilitation program during hospital stay.* (This includes counselling provided to patient and family along with pharmacological therapy including nicotine replacement, bupropion (Zyban), and formal smoking cessation programs. (ACC/AHA Practice Guidelines circ 2004). SHN has also included referral to a cardiac rehabilitation program.

**The Safer Healthcare Now! AMI Community of Practice has a number of teaching tools that can be downloaded and used by AMI teams making quality improvements in this component of AMI care.**

7. Statins at discharge for patients with AMI (NEW! AMI measure #9.0)  
Although there is currently no clinical trial evidence within the acute STEMI population there have been several good trials in the Non-STEMI population (MIRACL and TIMI-22-PROVE-IT studies). Therefore, a Class I Level A recommendation has been endorsed by the SHN-AMI faculty for atorvastatin 40- 80 mg (or equivalent Class II B Level C ) started within 48-96 hours of admission for Non-STEMI and Class II B Level C for STEMI with a target LDL of <1.9 mmol/L. Although the drug choice is left to the physician, the evidence suggests mid to high range dosing. In addition a Swedish registry study is showing survival benefit of statins at discharge and the Canadian Cardiovascular society recommends an LDL target level <2.0mmol/l.

Stenstrand U, Wallentin L; Swedish Register of Cardiac Intensive Care (RIKS-HIA). Early statin treatment following acute myocardial infarction and 1-year survival. *JAMA.* 2001 Jan 24-31;285(4):430-6.

R McPherson, J Frohlich, G Fodor, J Genest *Canadian Cardiovascular society position statement – Recommendations for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease.* Canadian Journal of Cardiology, 2006;22(11);913-927.

### ***Overall and Outcome Measures for AMI***

In addition to the process measures for each of the seven (7) key components of AMI care, organizations participating in the *Safer Healthcare Now!* Campaign should track two other important measures. (See **Appendix A** for the technical descriptions and worksheets 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 key care components, or documentation of clear contraindication.

Patients are counted as having received “perfect care” only if all seven (7) components are documented as given within appropriate time frames, or that clear contraindications existed. **Patients with a contraindication to a medication or arriving at the hospital outside of the approved time to receive thrombolysis are considered as meeting the criteria for the specific measure.** If documentation for any one item is missing, the patient is not considered as having received “perfect care.”

Perfect AMI care is an important measure and initially it may be difficult to see improvements. If the baseline measures for perfect AMI care are low, do not be discouraged as this is not uncommon. Your team will find it easier to move individual measures first and then build on your early success towards greater compliance with perfect care measures all round. Continue to concurrently measure on a regular basis. Once the individual measures reach high levels of performance, the perfect care measure should increase and your team will then be ready to apply new principles (such as reliability science) to increasing the results for perfect care.

#### AMI Mortality

The 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.

Use the analytical capacity and support of your Health Records Department to help you streamline your data collection so as to avoid duplication and, at the same time, meet CIHI reporting requirements. If your province has, or is, developing a Cardiac Care Outcomes Tracking Program, there are benefits to collaboration to standardize the measures between SHN and the Program. Cardiovascular Health Nova Scotia has begun this work, as one example.

### ***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. An integrated clinical documentation tools that follows the patient through the care continuum may be helpful. (See **Appendix C** for one sample).
3. Use small tests of change to test the design. (See the Model for Improvement.)
4. Measure the process; if the science is right, the outcomes will follow.
5. 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.
6. 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, and the patient/family).
7. Use the <https://communities.saferhealthcarenow.ca/ami> website to post and share your tools and to borrow the tools shared by others. This fosters collaborative learning.
8. Contact your Safety and Improvement Advisor (SIA) or Node Leader for assistance as you require.

### ***Measurement Data Collection Strategies, Tips and Tools***

**Appendix A** contains further details on the technical descriptions of the measures described above, including definitions of terms, numerators, denominators, exclusions, and data collection strategies.

**Appendix A** also contains a worksheet for each measure. The worksheets provide step-by-step tables for calculating the numerator, denominator, and final calculation for each measure. The worksheets can be used at the baseline stage (before you have started to implement the bundle) or implementation stage.

SHN recommends that before your facility, team or unit begins implementing the intervention, you obtain **baseline data**, using the worksheets provided. Baseline data will give you a sense of where you are starting from, and what some of the potential areas of focus are for your facility or team. We suggest that you take a “snapshot” of three months or more, or whatever is practical and feasible for your organization.

For ongoing measurement, SHN recommends calculating each of the AMI measures on a monthly or quarterly basis, to enable facilities to track the progress of their quality improvement initiatives.

**Retrospective chart review.** Appropriate patients can be identified using the required data elements in administrative data and health records. Detailed descriptions of the patient population appropriate for each of the indicators follows. A hospital information system (e.g. ADT, abstracting, etc.) 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 health records department to identify the patients at the time of coding and prepare a list or set aside records for review. After the patients have been identified, manual review of the medical record will be required to look for documentation that each appropriate intervention was either provided or contraindicated. If documentation for either cannot be found, the measure should be considered as not being met.

**Concurrent data collection while patients are still in the hospital is the preferred process for measurement and quality improvement.** This strategy allows for the identification of missed interventions so that mitigation can occur before discharge. Hospitals collecting this data have found that the process works best if clinical staff complete a small number of data elements, such as those found on the Sample Data Collection form (see **Appendix B**). This information, coupled with other data available in the chart, allows for more reliable completion of the measures by non-clinical staff in departments such as health records or decision support.

Teams that develop and consistently use a good clinical documentation tool that is a part of the patient’s record establish a ready means for concurrent audit and a source for data collection for measurement purposes. Check out the tools posted on your AMI Community of Practice at <http://communities.saferhealthcarenow.ca/ami> Start using them early in your change process and modify them as you move through PDSA cycles of change.

Other hospitals have developed a simple “discharge checklist” which includes data elements in the Improved Care for AMI bundle. This checklist is completed by nursing staff prior to discharging the patient from hospital. Some hospitals have identified 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 completed or identified as contraindicated. The data collection sheet remains in the medical record after discharge.

Overall, improving and standardizing clinical care documentation on the patient record is deemed best practice as a reinforcer of compliance with evidence-based standards. An example from the Atlantic Health Science Centre in St John, New Brunswick, Canada is provided in **Appendix C**.

**CIHI project field.** Several CIHI databases, including DAD and NACRS, have “project” fields. These fields allow each hospital to collect additional information related to a patient’s hospitalization. Hospitals may opt to enter the required AMI data in a pre-defined project field in the CIHI abstract. This approach:

- May reduce the data collection burden, as several data elements required for the measures (e.g. patient age and diagnosis, transfer in or out status, deaths, discharged against medical advice, etc.) are already documented in the abstract
- Builds on an existing process for multi-site data collection
- May prove to be a cost-effective and timely alternative to chart reviews

Coding guidelines for the CIHI project fields are available. Organizations are encouraged to consult with their CIHI field office for assistance with application of the guidelines.

Those opting for concurrent data collection (whether or not they use the CIHI project field) will need to check that they are collecting data on all appropriate patients. This group can be determined after discharge and coding, using an algorithm. Any cases missed and not identified until after discharge will require a manual retrospective review.

**Track Measures over Time.** Improvement takes place over time. Determining if improvement has really occurred and if it is a lasting effect requires observing patterns over time. **Run charts** show data over time and are one of the single most important tools in performance improvement. Using run charts has a variety of benefits:

- They help improvement teams formulate aims by depicting how well (or poorly) a team is performing relative to a specific process.
- They help in determining when changes are truly improvements by displaying a pattern of data that you can observe and monitor as you make changes.
- They give direction as you work on improvement and information about the value of particular changes.

- **Examples of run charts can be found in *Appendix A*.**
- **Please note that sample data collection forms in *Appendix B* are included for your reference, but not all are designed to collect all seven (7) of the AMI elements.**
- **Use them as a resource and adapt to meet your needs. Others are posted on the AMI Community of Practice.**
- **Contact your Node or the Central Measurement Team if you want some phone coaching for initial data submissions. These resources are happy to assist you.**

## APPENDIX A: Technical Descriptions and Worksheets

**Implementation Stages** – Definitions apply to all interventions and measures:

**Baseline State** – Pre-intervention. Data collected for Baseline should be collected prior to implementing small tests of change and reflect the current process.

**Early (Partial) Implementation Stage** – The team has: set a clear aim(s) for this intervention (i.e. AMI, CLI, MedRec, RRT, SSI or VAP); identified which measures will indicate if the changes will lead to improvement; and started to implement small tests of change (PDSA) to identify and refine processes, procedures and practices which will lead to improvement and achieving the aim. When the team is close to goal they are ready to move to Full Implementation.

**Full Implementation Stage** – The processes, procedures and practices are finalized and have lead to significant improvement. These practices on the selected unit are being consistently applied and monitored, showing a sustained performance at or close to goal. The team has achieved their aim(s) and is ready to spread to other areas.

## **1.0 Aspirin at Arrival – Technical Description**

**Intervention(s):** Improved Care for Acute Myocardial Infarction

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

**Goal:**  $\geq 90\%$ . (CCORT/CCS guidelines)

### **Matches Existing Measures:**

- CCORT/CCS Indicators for AMI Care (2003)
- CAEP Chest pain guideline for Society of Rural Physicians
- CMS 7th Scope of Work (IHI)
- National Quality Forum (IHI)

### **CALCULATION DETAILS:**

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

#### **Numerator Exclusions:**

- Same as the denominator

#### **Denominator Definition:**

- Concurrent analysis – Patients admitted through Emergency with diagnosis of AMI confirmed by **two** of the following:
  - **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB;
  - documented **symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or
  - documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.
- Retrospective analysis - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9. Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*

#### **Denominator Exclusions:**

- Patients less than 18 years of age
- Patients transferred to another acute care 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 and Sample Size:**

- Concurrent Sampling: Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. If volume allows, SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly.
- Retrospective Sampling: With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged within this month with an ICD-10-CA MRDx of I21.0 – I21.9. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

**Definition of Terms:**

- Hospital Arrival: The earliest documented date the patient arrived at the hospital; this may differ from the admission time
- AMI Patients:
  - Patients identified retrospectively who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9.
  - Patients identified concurrently who are admitted through Emergency with diagnosis of AMI confirmed by **two** of the following:
    - **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB;
    - documented **symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or
    - documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.

**Calculate as:**

- Numerator / Denominator; as a percentage of AMI patients who received aspirin within 24 hours before or after hospital arrival.

**Comments:**

- Do not double count the patient in this measure. If the patient received ASA within 24 hours prior to arrival **and** within 24 hours following arrival (s)he meets the standard of care and is counted once only.

## Aspirin at Arrival– Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) patients who received aspirin within 24 hours before or after hospital arrival.			
<b>Goal:</b>	≥90% (CCORT/CCS guidelines)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <i>Specify Region:</i>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b>	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Concurrent <input type="checkbox"/> Retrospective	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Denominator</b>			<b>Formula</b>	<b>Answer</b>
<b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>two of:</b> <ul style="list-style-type: none"> <li>▪ EKG showing elevated ST segments in 2 contiguous leads or new LBBB;</li> <li>▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or</li> </ul> documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.				
<b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9				
<b>General:</b> Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 meeting the criteria each month; first 5 meeting criteria between 0730-1530 + 1530-2330 + 2330-0730 etc.				
<b>1.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? (See definition above).			<b>1.1=</b>
<b>1.2</b>	What is the number of patients in # <b>1.1</b> whose age is less than 18 yrs on admission to hospital?			<b>1.2=</b>
<b>1.3</b>	Subtract the total of # <b>1.2</b> from the total of # <b>1.1</b> and enter here.		<b>(1.1 - 1.2 = )</b>	<b>1.3=</b>
<b>1.4</b>	What is the number of patients in # <b>1.3</b> transferred <b>out to</b> another acute care hospital on the day of arrival <b>and were NOT transferred back within 24 hours?</b>			<b>1.4=</b>
<b>1.5</b>	Subtract the total of # <b>1.4</b> from the total of # <b>1.3</b> and enter here.		<b>(1.3 - 1.4 = )</b>	<b>1.5=</b>
<b>1.6</b>	What is the number of patients in # <b>1.5</b> transferred <b>in from</b> another acute care hospital or Emergency Department on the day of arrival <b>and were NOT transferred back within 24 hours?</b>			<b>1.6=</b>
<b>1.7</b>	Subtract the total of # <b>1.6</b> from the total of # <b>1.5</b> and enter here.		<b>(1.5 - 1.6 = )</b>	<b>1.7=</b>
<b>1.8</b>	What is the number of patients in # <b>1.7</b> who were discharged <b>OR</b> expired <b>OR</b> left against medical advice on the day of arrival?			<b>1.8=</b>

<b>1.9</b>	Subtract the total of # <b>1.8</b> from the total of # <b>1.7</b> and enter here.	$(1.7 - 1.8 = )$	<b>1.9=</b>	
<b>1.10</b>	What is the number of patients in # 1.9 with one or more documented ASA contraindications including: Active bleeding on arrival or within 24 hours after arrival; ASA allergy; Coumadin/warfarin as pre-arrival medication; other reason documented by physician or nurse for not giving ASA within 24 hours before or after hospital arrival?		<b>1.10=</b>	
<b>1.11</b>	Subtract the total of # 1.10 from the total of # 1.9 and enter here.	$(1.9 - 1.10 = )$	<b>1.11=</b>	
<b>1.12</b>	Continue to select patients according to criteria 1.1 to 1.11 up to and including patient #15 or the sample size selected by the hospital AMI team. Enter final sample number here.	<b>FINAL SAMPLE SIZE</b>	<b>1.12=</b>	
<b>Calculation of Numerator - Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>1.13</b>	What is the total number of patients in # <b>1.12</b> who received ASA within 24 hours prior to hospital arrival? <i>Include ASA taken routinely on a daily basis and ASA given by paramedics prior to arrival at Emergency Department.</i>		<b>1.13=</b>	
<b>1.14</b>	What is the total number of patients in # <b>1.12</b> who received ASA within 24 hours following hospital arrival? <i>Include ASA given in Emergency Department and ASA ordered and on admission within 24 hours. If patient was counted in 1.13 DO NOT count the patient again in 1.14</i>		<b>1.14=</b>	
<b>1.15</b>	Add the answer to # <b>1.13</b> and # <b>1.14</b> and enter here.	$(1.13 + 1.14 = )$	<b>1.15=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>1.16</b>	Divide # <b>1.15</b> by # <b>1.12</b> . Multiply by 100.	$(1.15 / 1.12) \times 100$	<b>1.16=</b>	

## 2.0 Aspirin at Discharge – Technical Description

**Intervention(s):** Improved Care for Acute Myocardial Infarction

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

**Goal:**  $\geq 90\%$  (CCORT/CCS guidelines)

**Matches Existing Measures:**

- CCORT/CCS Indicators for AMI Care (2003)
- JCAHO Core Measure AMI-1 (IHI)
- CMS 7th Scope of Work (IHI)
- National Quality Forum (IHI)

### CALCULATION DETAILS:

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

**Numerator Exclusions:**

- Same as the denominator

**Denominator Definition:**

- Concurrent analysis – Patients admitted through Emergency with diagnosis of AMI confirmed by **two** of the following:
  - **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB;
  - documented **symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or
  - documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.
- Retrospective analysis - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9. Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*.

**Denominator Exclusions:**

- Patients less than 18 years of age
- Patients transferred to another acute care hospital
- Patients who expired
- Patients who left against medical advice
- Patients with one or more of the following aspirin contraindications/reasons for not prescribing aspirin documented in the medical record:
  - Active bleeding
  - Aspirin allergy
  - Coumadin/warfarin prescribed at discharge
  - Other reasons documented by a physician, nurse practitioner, or physician assistant for not giving aspirin at discharge

**Measurement Period Length and Sample Size:**

- **Concurrent Sampling:** Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. If volume allows, SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly.
- **Retrospective Sampling:** With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged **alive** within this month with an ICD-10-CA MRDx of I21.0 – I21.9. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

**Definition of Terms:**

- Hospital Discharge: The documented date that the patient left the hospital;
- AMI Patients:
  - Patients identified **retrospectively** who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9.
  - Patients identified **concurrently** who are admitted through Emergency with diagnosis of AMI confirmed by **two of:** **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.

**Calculate as:**

Numerator / Denominator; as a percentage of AMI patients who are prescribed aspirin at hospital discharge.

## 2.0 Aspirin at Discharge – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) patients who were prescribed aspirin at discharge from hospital.			
<b>Goal:</b>	≥90% (CCORT/CCS guidelines)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <i>Specify Region:</i>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	<i>Indicate the year for which the data was collected:</i> <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b>	<input type="checkbox"/> Concurrent <input type="checkbox"/> Retrospective
<b>Month:</b>	<i>Indicate the month for which the data was collected:</i> <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	<i>Describe the source of the patient sample.</i>			
<b>Additional Information:</b>	<i>Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital</i>			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Denominator</b>			<b>Formula</b>	<b>Answer</b>
<b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>two of:</b> ▪ <b>EKG</b> showing elevated ST segments in 2 contiguous leads or new LBBB; ▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction. <b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9 <b>General:</b> Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 meeting the criteria each month; first 5 meeting criteria between 0730-1530 + 1530-2330 + 2330-0730 etc.				
<b>2.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? ( <i>See definition above</i> ).			<b>2.1=</b>
<b>2.2</b>	What is the number of patients in # <b>2.1</b> whose age is less than 18 yrs on admission to hospital?			<b>2.2=</b>
<b>2.3</b>	Subtract the total of # <b>2.2</b> from the total of # <b>2.1</b> and enter here.		<b>(2.1 – 2.2 = )</b>	<b>2.3=</b>
<b>2.4</b>	What is the number of patients in # <b>2.3</b> who transferred <b>out to</b> another acute care hospital <b>and NOT transferred back within 24 hours?</b>			<b>2.4=</b>
<b>2.5</b>	Subtract the total of # <b>2.4</b> from the total of # <b>2.3</b> and enter here.		<b>(2.3 - 2.4 = )</b>	<b>2.5=</b>
<b>2.6</b>	What is the number of patients in # <b>2.5</b> who expired <b>OR</b> left against medical advice?			<b>2.6=</b>
<b>2.7</b>	Subtract the total of # <b>2.6</b> from the total of # <b>2.5</b> and enter here.		<b>(2.5 – 2.6 = )</b>	<b>2.7=</b>
<b>2.8</b>	What is the number of patients in # <b>2.7</b> with one or more documented ASA contraindications including: Active bleeding; ASA allergy; Coumadin/warfarin ordered at discharge; other reason documented by physician for not prescribing			<b>2.8=</b>

	ASA at discharge?			
<b>2.9</b>	Continue to select patients according to criteria <b>2.1</b> to <b>2.8</b> up to and including patient #15 or the sample size selected by the hospital AMI team. Enter final sample number here.	<b>FINAL SAMPLE SIZE</b>	<b>2.9=</b>	
<b>Calculation of Numerator - Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>2.10</b>	What is the total number of patients in # <b>2.9</b> who are prescribed ASA at discharge?		<b>2.10=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>2.11</b>	Divide # <b>2.10</b> by # <b>2.9</b> . Multiply by 100.	$(2.10 / 2.9) \times 100 =$	<b>2.11=</b>	%

### 3.0 Beta Blocker Prescribed at Discharge – Technical Description

**Intervention(s):** Improved Care for Acute Myocardial Infarction

**Definition:** The percentage of acute myocardial infarction (AMI) patients who are prescribed a beta blocker at hospital discharge

**Goal:**  $\geq 90\%$

**Matches Existing Measures:**

- CCORT/CCS Indicators for AMI Care (2003)
- CMS 7th Scope of Work (IHI)
- National Quality Forum (IHI)

#### CALCULATION DETAILS:

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

**Numerator Exclusions:**

- Same as the denominator

**Denominator Definition:**

- Concurrent analysis – Patients admitted through Emergency with diagnosis of AMI confirmed by two of the following:
  - **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB;
  - documented **symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or
  - documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.
- Retrospective analysis - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9. Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*

**Denominator Exclusions:**

- Patients less than 18 years of age
- Patients transferred to another acute care hospital
- Patients who expired
- Patients who left against medical advice
- 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 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 or nurse for not prescribing a beta blocker at discharge

- **Measurement Period Length and Sample Size:**
- **Concurrent Sampling:** Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. If volume allows, SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly.
- **Retrospective Sampling:** With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged **alive** within this month with an ICD-10-CA MRDx of I21.0 – I21.9. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

**Definition of Terms:**

- Hospital Discharge: The documented date that the patient left the hospital;
- AMI Patients:
  - Patients identified retrospectively who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9.
  - Patients identified concurrently who are admitted through Emergency with diagnosis of AMI confirmed by two of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.

**Calculate as:**

Numerator / Denominator; as a percentage of AMI patients who are prescribed a beta blocker at hospital discharge.

### 3.0 Beta Blocker at Discharge – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) patients who were prescribed a beta blocker at discharge from hospital.			
<b>Goal:</b>	≥90%			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <i>Specify Region:</i>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	<i>Indicate the year for which the data was collected:</i> <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b>	<input type="checkbox"/> Concurrent <input type="checkbox"/> Retrospective
<b>Month:</b>	<i>Indicate the month for which the data was collected:</i> <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	<i>Describe the source of the patient sample.</i>			
<b>Additional Information:</b>	<i>Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital</i>			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Denominator</b>			<b>Formula</b>	<b>Answer</b>
<b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>two of:</b> <ul style="list-style-type: none"> <li>▪ EKG showing elevated ST segments in 2 contiguous leads or new LBBB;</li> <li>▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or</li> </ul> documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.				
<b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9				
<b>General:</b> Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 meeting the criteria each month; first 5 meeting criteria between 0730-1530 + 1530-2330 + 2330-0730 etc.				
<b>3.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? (See definition above).			<b>3.1 =</b>
<b>3.2</b>	What is the number of patients in # 3.1 whose age is less than 18 yrs on admission to hospital?			<b>3.2 =</b>
<b>3.3</b>	Subtract the total of # 3.2 from the total of # 3.1 and enter here.		<b>(3.1 – 3.2 = )</b>	<b>3.3=</b>
<b>3.4</b>	What is the number of patients in # 3.1 transferred <b>out to</b> another acute care hospital <b>and not transferred back within 24 hours?</b>			<b>3.4 =</b>
<b>3.5</b>	Subtract the total of # 3.4 from the total of # 3.3 and enter here.		<b>(3.3 – 3.4 = )</b>	<b>3.5=</b>
<b>3.6</b>	What is the number of patients in # 3.5 who expired <b>OR</b> left against medical advice?			<b>3.6 =</b>
<b>3.7</b>	Subtract the total of # 3.6 from the total of # 3.5 and enter here.		<b>(3.5 – 3.6 = )</b>	<b>3.7=</b>

<b>3.8</b>	What is the number of patients in # <b>3.1</b> with one or more documented documented contraindications to Beta Blocker contraindications including: Beta blocker allergy; Bradycardia (heart rate less than 50 bpm) on day of discharge or day prior to discharge while not on a beta blocker; 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 or nurse for not prescribing a beta blocker at discharge?		<b>3.8 =</b>	
<b>3.9</b>	Subtract the total of # <b>3.8</b> from the total of # <b>3.7</b> and enter here.	<b>(3.7 – 3.8 = )</b>	<b>3.9=</b>	
<b>3.10</b>	Continue to select patients according to criteria <b>3.1</b> to <b>3.9</b> up to and including patient #15 or the sample size selected by the hospital AMI team. Enter final sample number here.	<b>FINAL SAMPLE SIZE</b>	<b>3.10 =</b>	
<b>Calculation of Numerator - Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>3.11</b>	What is the total number of patients in # <b>3.10</b> prescribed a Beta Blocker at discharge?		<b>3.11=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>3.12</b>	Divide # <b>3.11</b> by # <b>3.10</b> . Multiply by 100.	<b>(3.11 / 3.10) x 100 =</b>	<b>3.12 =</b>	<b>%</b>

## 4.0 Timely Initiation of Reperfusion (4.0-A Thrombolysis or 4.0-B Percutaneous Intervention) – Technical Description

### 4.0-A Thrombolytic Agent Received Within 30 Minutes of Hospital Arrival

**Intervention(s):** Improved Care for Acute Myocardial Infarction

**Definition:** The percentage of acute myocardial infarction (AMI) patients (STEMI or new LBBB only ) receiving thrombolytic therapy during the hospital stay and having a time from hospital arrival to thrombolysis of 30 minutes or less.

**Goal:**  $\geq 85\%$  (CCORT/CCS guidelines)

**Matches Existing Measures:**

- CCORT/CCS Indicators for AMI Care (2003)
- CAEP Chest pain guideline for Society of Rural Physicians
- JCAHO Core Measures AMI – 7a (IHI)
- CMS 7th Scope of Work (IHI)
- National Quality Forum (IHI)

### CALCULATION DETAILS:

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

**Numerator Exclusions:**

- Same as the denominator

**Denominator Definition:**

- Concurrent analysis –
  - Patients admitted through Emergency with diagnosis of AMI **and**,
  - **EKG** showing elevated ST segments (STEMI) in 2 contiguous leads or new LBBB **and**,

**Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; **or**

- Retrospective analysis:
  - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.3; I21.9 **and**,
  - ST elevation (STEMI) or new LBBB on ECG **and**,
  - Received thrombolytic therapy (CCI Code 1.ZZ.35.HA-C1)
  - Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*

- **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction **and**,
- Received thrombolytic therapy

**Denominator Exclusions:**

- Patients with NSTEMI, non-Q wave or subendocardial MIs
- Patients less than 18 years of age
- Patients transferred **in from** another acute care hospital including another emergency department

**Measurement Period Length and Sample Size:**

- Concurrent Sampling: Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. Be sure to select patients who demonstrate ST elevation (STEMI) or new LBBB on the earliest ECG **and** either symptoms or enzyme elevation. If volume allows, SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly. If using the original monthly AMI sample selected you may have to over-sample for thrombolytic patients in order to obtain an adequate sample – this is a decision should be made by your AMI team.
- Retrospective Sampling: With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged within this month with an ICD-10-CA MRDx of I21.0 – I21.3; I21.9 **and** received thrombolytic therapy **and** had ST elevation (STEMI) or new LBBB (ICD-10-CA code I44.4-I44.7) on the earliest ECG. It may be necessary to select more than 15 patient charts which meet the coding and thrombolysis criteria in order to fulfill the EKG criterion for inclusion. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly. If using the original monthly AMI sample selected you may have to over-sample for thrombolytic patients in order to obtain an adequate sample – this is a decision should be made by your AMI team.

**Definition of Terms:**

- AMI Patients with ST elevation (STEMI) or new LBBB on ECG who received thrombolytic therapy - Patients discharged with all of the following:
  - Patients identified **retrospectively** who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.3; I21.9 **and**,
  - ST Segment elevation or new LBBB on the ECG performed closest to hospital arrival, **and**,
  - Thrombolytic therapy within 6 hours after hospital arrival (CCI Code 1.ZZ.35.HA-C1)

- AMI Patients with ST elevation (STEMI) or new LBBB on ECG who received thrombolytic therapy - Patients discharged with all of the following:
  - Patients identified **concurrently** who are admitted through Emergency with a diagnosis of AMI (STEMI) **and**
  - ST Segment elevation or new LBBB on the ECG performed closest to hospital arrival, **and,**
  - Symptoms compatible with AMI **or** Enzyme elevation
  - 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 new LBBB on ECG - see *“Comments” below*

**Calculate as:**

Numerator / Denominator; as a percentage of AMI patients receiving a thrombolytic agent who received it within 30 minutes of arrival.

**Comments:**

**Use the following rules for abstraction of ST segment elevation or new 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 or nurse who reviewed the ECG is signed, stamped, or typed on the report, or
  - Physician or nurse 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 new LBBB on the ECG tracing.
- If the ECG report is not specifically labelled “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 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 pre-arrival and post-arrival ECG is the same (e.g., both were done 15 minutes from hospital arrival time), include the patient if any of these ECGs have ST segment elevation or new 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 “**STEMI**” or “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). (**Exclude ICD-10-CA code I21.40 – I21.49**)
- 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 indeterminate”, “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”.
- Exclude the patient when both an inclusion and exclusion are documented in reference to the same ECG, or documentation is otherwise conflicting. 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 “new 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 not 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:**

- Patients arriving in the Emergency Department via ambulance with thrombolytic therapy infusing at the time of arrival are to be included.
- Patients arriving in the Emergency Department via ambulance and thrombolytic therapy was infused during transport but completed prior to the time of hospital arrival are to be excluded.
- Patients suffering an AMI post admission (i.e. on nursing unit) and receiving thrombolysis are to be excluded.

Thrombolysis is not indicated in NON-STEMI or Sub-endocardial MIs

By the time you have completed applying all exclusions (e.g. transfers in, transfers out) to your monthly AMI patient sample which include both STEMI and Non-STEMIs you may not have a sufficient number of STEMI patients eligible for inclusion in measure 4A or B.

**You should consider selecting a different patient sample for measure 4A and 4B limiting the sample to the STEMI infarcts only.**

## 4.0-A Thrombolytic Agent Received Within 30 Minutes of Hospital Arrival (Retrospective) – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) (STEMI or new LBBB) patients receiving thrombolytic therapy during the hospital stay and having a time from hospital arrival to thrombolysis of 30 minutes or less.			
<b>Goal:</b>	≥85% (CCORT/CCS guidelines)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <b>Specify Region:</b>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Retrospective	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Retrospective Denominator</b>			<b>Formula</b>	<b>Answer</b>
<b>4.1</b>	What is the total number of patients in this month with an ICD-10-CA MRDx of I21.0 – I21.3, I21.9?			<b>4.1=</b>
<b>4.2</b>	What is the total number of patients in # 4.1 whose age was less than 18 yrs on admission to hospital? <i>Exclude from patient list for calculating Thrombolytic Agents Received within 30 minutes of arrival.</i>			<b>4.2=</b>
<b>4.3</b>	Subtract the total of # 4.2 from the total of # 4.1 and enter here.		<b>(4.1 - 4.2 = )</b>	<b>4.3=</b>
<b>4.4</b>	What is the total number of patients in # 4.3 transferred <b>in from</b> another acute care hospital or Emergency Department <b>and not transferred back within 24 hours</b> ? <i>Exclude from patient list for calculating Thrombolytic Agents Received within 30 minutes of arrival.</i>			<b>4.4=</b>
<b>4.5</b>	Subtract the total of # 4.4 from the total of # 4.3 and enter here.		<b>(4.3 - 4.4 = )</b>	<b>4.5=</b>
<b>4.6</b>	What is the total number of patients in # 4.5 whose earliest ECG interpretation did not indicate ST elevation (STEMI) or Left Bundle Branch Block (new LBBB)? <i>Exclude from patient list for calculating Thrombolytic Agents Received within 30 minutes of arrival by chart review.</i>			<b>4.6=</b>
<b>4.7</b>	Subtract the total of # 4.6 from the total of # 4.5 and enter here.		<b>(4.5 - 4.6 = )</b>	<b>4.7=</b>
<b>4.8</b>	What is the total number of patients in # 4.7 who did not have a thrombolytic agent administered? <i>Exclude from patient list for calculating Thrombolytic Agents Received within 30 minutes of arrival by chart review.</i>			<b>4.8=</b>
<b>4.9</b>	Subtract the total of # 4.8 from the total of # 4.7 and enter here.		<b>(4.7 - 4.8 = )</b>	<b>4.9=</b>
<b>4.10</b>	What is the total number of patients in # 4.9 who underwent thrombolysis more than 360 minutes (6 hours) after arrival time? <i>Exclude from patient list for calculating Thrombolytic Agents Received within 30 minutes of arrival by chart review.</i>			<b>4.10=</b>
<b>4.11</b>	Subtract the total of # 4.10 from the total of # 4.9 and enter here.		<b>(4.9 - 4.10 = )</b>	<b>4.11=</b>
<b>4.12</b>	Select a sample of 15 patients (or the sample size selected by the hospital AMI		<b>FINAL SAMPLE</b>	<b>4.12=</b>

	team) from those remaining in #4.11. Enter final sample number here.	<b>SIZE</b>		
<b>Calculation of Numerator - Retrospective</b>		<b>Formula</b>	<b>Answer</b>	
<b>4.13</b>	What is the total number of patients in # 4.12 who received thrombolysis in 30 minutes or less from arrival? (CCI Code 1.ZZ.35.HA-C1)		<b>4.13=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>4.14</b>	Divide # 4.13 by #4.12. Multiply by 100.	$(4.13 / 4.12) \times 100 =$	<b>4.14=</b>	%

## 4.0-A Thrombolytic Agent Received Within 30 Minutes of Hospital Arrival (Concurrent) – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) (STEMI or new LBBB) patients receiving thrombolytic therapy during the hospital stay and having a time from hospital arrival to thrombolysis of 30 minutes or less.			
<b>Goal:</b>	≥85% (CCORT/CCS guidelines)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <i>Specify Region:</i>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Concurrent	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Concurrent Denominator</b>			<b>Formula</b>	<b>Answer</b>
Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 discharges meeting the criteria each month; every third discharge meeting the criteria each month etc.				
<b>4.1</b>	Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>EKG</b> showing elevated ST segments in 2 contiguous leads or Left Bundle Branch Block (new LBBB); <b>and either</b> (1) documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc. <b>or</b> (2) documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction. <i>ECG findings are required for inclusion in this measure.</i>			<b>4.1=</b>
<b>4.2</b>	What is the number of patients in # 4.1 whose age is less than 18 yrs on admission to hospital?			<b>4.2=</b>
<b>4.3</b>	Subtract the total of # 4.2 from the total of # 4.1 and enter here.		<b>(4.1 – 4.2 = )</b>	<b>4.3=</b>
<b>4.4</b>	What is the number of patients in # 4.3 transferred <b>in from</b> another acute care hospital or Emergency Department <b>and NOT transferred back within 24 hours?</b>			<b>4.4=</b>
<b>4.5</b>	Subtract the total of # 4.4 from the total of # 4.3 and enter here.		<b>(4.3 – 4.4 = )</b>	<b>4.5=</b>
<b>4.6</b>	What is the number of patients in # 4.5 who received thrombolysis more than 360 minutes (6 hours) after arrival time?			<b>4.6=</b>
<b>4.7</b>	Subtract the total of # 4.6 from the total of # 4.5 and enter here.		<b>(4.5 – 4.6 = )</b>	<b>4.7=</b>
<b>4.8</b>	Continue to select STEMI or new LBBB patients according to criteria 4.1 to 4.7 up to and including patient #15 or the sample size selected by the hospital AMI team. Enter final sample number here.		<b>FINAL SAMPLE SIZE</b>	<b>4.8=</b>

<b>Calculation of Numerator – Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>4.9</b>	What is the total number of patients in # 4.8 who received thrombolysis in 30 minutes or less from arrival?		<b>4.9=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>4.10</b>	Divide # 4.9 by # 4.8. Multiply by 100.	$(4.9 / 4.8) \times 100 =$	<b>4.10=</b>	%

## 4.0 Timely Initiation of Reperfusion (4.0-A Thrombolysis or 4.0-B Percutaneous Intervention) – Technical Description

### 4.0-B Primary Percutaneous Coronary Intervention (PCI) Received Within 90 Minutes of Hospital Arrival

**Intervention(s):** Improved Care for Acute Myocardial Infarction

**Definition:** The percentage of acute myocardial infarction (AMI) patients (STEMI or new LBBB only) who received Primary Percutaneous Coronary Intervention (PCI) within 90 minutes or less from hospital arrival to PCI

**Goal:**  $\geq 90\%$

Matches Existing Measures:

#### CALCULATION DETAILS:

**Numerator Definition:** AMI patients with ST elevation (STEMI) or new LBBB on ECG who received Primary PCI whose time from hospital arrival to PCI was 90 minutes or less.

#### Numerator Exclusions:

- Same as the denominator

#### Denominator Definition:

- Concurrent analysis –
  - Patients admitted through Emergency with diagnosis of AMI **and**,
  - **EKG** showing elevated ST segments (STEMI) in 2 contiguous leads or new LBBB **and**,
  - **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; **or**
  - **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction **and**,
  - Received a Primary PCI
- Retrospective analysis:
  - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.3; I21.9 **and**,
  - ST elevation (STEMI) or new LBBB (ICD-10-CA code I44.4-I44.7) on ECG **and**,
  - Received a Primary PCI (CCI code 1.IJ.50)

Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*

**Denominator Exclusions:**

- Patients with NSTEMI, non Q wave or subendocardial MIs
- Patients less than 18 years of age
- Patients transferred **in from** another acute care hospital including another emergency department
- Patients who received a thrombolytic agent administration

**Measurement Period Length and Sample Size:**

- **Concurrent Sampling:** Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. Be sure to select patients who demonstrate ST elevation (STEMI) or new new LBBB on the earliest ECG **and** either symptoms or enzyme elevation. If volume allows, SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly. **If using the original monthly AMI sample selected you may have to over sample for Primary PCI patients in order to obtain an adequate sample – this is a decision should be made by your AMI team.**
- **Retrospective Sampling:** With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged within this month with an ICD-10-CA MRDx of I21.0 – I21.3; I21.9 **and** received a Primary PCI (CCI code 1.IJ.50) **and** had ST elevation or new LBBB (ICD-10-CA code I44.4-I44.7) on ECG. It may be necessary to select more than 15 patient charts, which meet the coding, and primary PCI criteria in order to fulfill the EKG criterion for inclusion. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly. **If using the original monthly AMI sample selected you may have to over-sample for Primary PCI patients in order to obtain an adequate sample – this is a decision should be made by your AMI team.**

**Definition of Terms:**

- AMI Patients with ST elevation (STEMI) or new LBBB on ECG who received thrombolytic - Patients discharged with all of the following:
  - Patients identified **retrospectively** who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.3; I21.9 **and**,
  - Primary PCI (CCI Code 1.IJ.50.^) Dilation, coronary arteries) **and**,
  - ST Segment elevation or new LBBB (ICD-10-CA code I44.4-I44.7) on the ECG performed closest to hospital arrival, **and**,
  - Primary PCI performed within 24 hours after hospital arrival (CCI code 1.IJ.50)
- AMI Patients with ST elevation (STEMI) or new LBBB on ECG who received thrombolytic - Patients discharged with all of the following:
  - Patients identified **concurrently** who are admitted through Emergency with a diagnosis of AMI **and**
  - ST Segment elevation (STEMI) or new LBBB on the ECG performed closest to hospital arrival, **and**,
  - Symptoms compatible with AMI **or** Enzyme elevation
  - 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 (STEMI) or new LBBB (ICD-10-CA code I44.4-I44.7) on ECG - see "Comments" below

**Calculate as:**

Numerator / Denominator; as a percentage of AMI patients receiving a Primary PCI who received it within 90 minutes of arrival.

**Comments:**

**Use the following rules for abstraction of ST segment elevation or new 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 or nurse who reviewed the ECG is signed, stamped, or typed on the report, or
  - Physician or nurse 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 new LBBB on the ECG tracing.
- If the ECG report is not specifically labelled "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 or nurse 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 pre-arrival and post-arrival ECG is the same (e.g., both were done 15 minutes from hospital arrival time), include the patient any of these ECGs have ST segment elevation or new 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 "STEMI" or "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). (**Exclude ICD-10-CA code I21.40 – I21.49**)
- 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 indeterminate", "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”.

- **Exclude the patient** when the PCI is performed as a “salvage” procedure.
- **Exclude the patient** when both an inclusion and exclusion are documented in reference to the same ECG, or documentation is otherwise conflicting. 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”.

## 4.0-B Primary Percutaneous Coronary Intervention (PCI) Received Within 90 Minutes of Hospital Arrival (Retrospective) – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) patients (STEMI or new LBBB only) who received Primary Percutaneous coronary intervention (PCI) within 90 minutes or less from hospital arrival to PCI			
<b>Goal:</b>	≥90% (?)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <i>Specify Region:</i>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Retrospective	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Retrospective Denominator</b>			<b>Formula</b>	<b>Answer</b>
<b>4.1</b>	What is the total number of patients in this month with an ICD-10-CA MRDx of I21.0 – I21.3; I21.9?			<b>4.1=</b>
<b>4.2</b>	What is the total number of patients in # 4.1 whose age was less than 18 yrs on admission to hospital? Exclude from patient list for calculating PCI performed within 90 minutes of arrival.			<b>4.2=</b>
<b>4.3</b>	Subtract the total of # 4.2 from the total of # 4.1 and enter here.		(4.1 – 4.2 = )	<b>4.3=</b>
<b>4.4</b>	What is the total number of patients in # 4.3 transferred <b>in from</b> another acute care hospital or Emergency Department <b>and not transferred back within 24 hours</b> ? Exclude from patient list for calculating PCI performed within 90 minutes of arrival.			<b>4.4=</b>
<b>4.5</b>	Subtract the total of # 4.4 from the total of # 4.3 and enter here.		(4.3 – 4.4 = )	<b>4.5=</b>
<b>4.6</b>	What is the total number of patients in # 4.5 whose earliest ECG interpretation did not indicate ST elevation or Left Bundle Branch Block (new LBBB)? Exclude from patient list for calculating PCI performed within 90 minutes of arrival by chart review			<b>4.6=</b>
<b>4.7</b>	Subtract the total of # 4.6 from the total of # 4.5 and enter here.		(4.5 – 4.6 = )	<b>4.7=</b>
<b>4.8</b>	What is the total number of patients in # 4.7 who did not have a Primary PCI? Exclude from patient list for calculating Primary PCI performed within 90 minutes of arrival.			<b>4.8=</b>
<b>4.9</b>	Subtract the total of # 4.8 from the total of # 4.7 and enter here.		(4.7 – 4.8 = )	<b>4.9=</b>
<b>4.10</b>	What is the total number of patients in # 4.9 who underwent PCI more than 24 hours after arrival time? (CCI code 1.IJ.50) Exclude from patient list for calculating PCI performed within 90 minutes of arrival			<b>4.10=</b>
<b>4.11</b>	Subtract the total of # 4.10 from the total of # 4.9 and enter here.		(4.9 – 4.10 = )	<b>4.11=</b>
<b>4.12</b>	Select a sample of 15 patients (or the sample size selected by the hospital AMI team) from those remaining in #4.11. Enter final sample number here.		<b>FINAL SAMPLE SIZE</b>	<b>4.12=</b>
<b>Calculation of Numerator - Retrospective</b>			<b>Formula</b>	<b>Answer</b>

4.13	What is the total number of patients in # 4.12 who received a Primary PCI in 90 minutes or less from arrival? (CCI code 1.IJ.50)		4.13=	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
4.14	Divide # 4.13 by #4.12. Multiply by 100.	$(4.13 / 4.12) \times 100 =$	4.14=	%

## 4.0-B Primary Percutaneous Coronary Intervention (PCI) Received Within 90 Minutes of Hospital Arrival (Concurrent) – Measurement Worksheet

Improved Care for Acute Myocardial Infarction				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) patients (STEMI or new LBBB only) who received Primary Percutaneous coronary intervention (PCI) within 90 minutes or less from hospital arrival to PCI			
<b>Goal:</b>	≥90% (?)			
Data Collection Details				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <b>Specify Region:</b>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Concurrent	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
Selection of Monthly Sample – Concurrent Denominator			Formula	Answer
Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 discharges meeting the criteria each month; every third discharge meeting the criteria each month etc.				
<b>4.1</b>	Of patients admitted through the Emergency Department include only those with a diagnosis of AMI confirmed by <b>EKG</b> showing elevated ST segments (STEMI) in 2 contiguous leads or Left Bundle Branch Block (new LBBB); <b>and either (1)</b> documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc. <b>or (2)</b> documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction. <i>ECG findings are required for inclusion in this measure.</i>			<b>4.1=</b>
<b>4.2</b>	What is the number of patients in # <b>4.1</b> whose age is less than 18 yrs on admission to hospital?			<b>4.2=</b>
<b>4.3</b>	Subtract the total of # <b>4.2</b> from the total of # <b>4.1</b> and enter here.		<b>(4.1 – 4.2 = )</b>	<b>4.3=</b>
<b>4.4</b>	What is the number of patients in # <b>4.3</b> transferred <b>in from</b> another acute care hospital or Emergency Department <b>and not transferred back within 24 hours?</b>			<b>4.4=</b>
<b>4.5</b>	Subtract the total of # <b>4.4</b> from the total of # <b>4.3</b> and enter here.		<b>(4.3 – 4.4 = )</b>	<b>4.5=</b>
<b>4.6</b>	What is the number of patients in # <b>4.5</b> who underwent a PCI more than 24 hours after arrival time?			<b>4.6=</b>
<b>4.7</b>	Subtract the total of # <b>4.6</b> from the total of # <b>4.5</b> and enter here.		<b>(4.5 – 4.6 = )</b>	<b>4.7=</b>
<b>4.8</b>	Continue to select patients according to criteria <b>4.1</b> to <b>4.7</b> up to and including patient #15 or the sample size selected by the hospital AMI team. Enter final sample number here.		<b>FINAL SAMPLE SIZE</b>	<b>4.8=</b>
Calculation of Numerator – Concurrent			Formula	Answer

4.9	What is the total number of patients in # 4.8 who underwent a Primary PCI in 90 minutes or less from arrival?		4.9=	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
4.10	Divide # 4.9 by #4.8. Multiply by 100.	$(4.9 / 4.8) \times 100 =$	4.10=	%

## **5.0 ACE-Inhibitor or Angiotensin Receptor Blockers (ARB) Prescribed at Discharge – Technical Description**

**Intervention(s):** Improved Care for Acute Myocardial Infarction

**Definition:** The percentage of acute myocardial infarction (AMI) patients with Q-wave infarction, hypertension, diabetes or left ventricular systolic dysfunction who were prescribed an ACE-inhibitor or Angiotensin Receptor Blockers (ARB) at discharge from hospital.

**Goal:**  $\geq 85\%$  (CCORT/CCS guidelines)

**Matches Existing Measures:**

- CCORT/CCS Indicators for AMI Care (2003)

### **CALCULATION DETAILS:**

**Numerator Definition:** AMI patients with Q-wave infarction, hypertension, diabetes or left ventricular systolic dysfunction who are prescribed an ACE-inhibitor or angiotensin receptor blockers (ARB) at hospital discharge.

**Numerator Exclusions:**

- Same as the denominator

**Denominator Definition:**

- Concurrent analysis – Patients admitted through Emergency with diagnosis of AMI confirmed by two of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction **and** chart documentation of with Q-wave infarction, hypertension, diabetes or left ventricular systolic dysfunction
- Chart documentation of left ventricular systolic dysfunction ICD-10-CA code I51.8 or I50 with evidence of heart failure.
- Retrospective analysis - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9. Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*.

**Denominator Exclusions:**

- Patients less than 18 years of age
- Patients transferred to another acute care hospital
- Patients who expired
- Patients who left against medical advice
- Patients with a chart documentation of participation in clinical trials testing alternatives to ACE-Is or ARBs as first-line therapy
- Patients with one or more of the following ACE-Inhibitors contraindications/reasons for not prescribing ACE Inhibitor or ARB documented in the medical record:
  - Moderate or severe aortic stenosis
  - Allergy or intolerance to ACE inhibitors or ARBs

- Severe renal dysfunction (i.e., peak or last prehospital discharge serum creatinine level >200 µmol/L)
- Systolic blood pressure <100 mmHg at discharge
- Bilateral renal artery stenosis
- Hyperkalemia (ie, peak or last prehospital discharge K<sup>+</sup> >4.5 mmol/L)
- Physician documented reason for nonuse of ACE inhibitor at discharge (eg, patient refusal, symptomatic hypotension)

### **Measurement Period Length and Sample Size:**

- **Concurrent Sampling:** Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. If volume allows, SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly.
- **Retrospective Sampling:** With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged **alive** within this month with an ICD-10-CA MRDx of I21.0 – I21.9 and *ICD-10-CA code for Q-wave infarction*, hypertension, diabetes or left ventricular systolic dysfunction. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

### **Definition of Terms:**

- Hospital Discharge: The documented date that the patient left the hospital;
- AMI Patients:
  - Patients identified **retrospectively** who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9 **and** chart documentation of left ventricular systolic dysfunction *ICD-10-CA code for Q-wave infarction*, hypertension, diabetes or left ventricular systolic dysfunction
  - Patients identified **concurrently** who are admitted through Emergency with diagnosis of AMI confirmed by **two** of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction **and** chart documentation of Q-wave infarction, hypertension, diabetes or left ventricular systolic dysfunction
- Pathological Q waves occur if they are 25% or more of the height of the partner R wave and/or they are greater than 0.04 seconds in width - one small square - and greater than 2mm (two small squares) in depth. Although not always evident in the early stages of and AMI they usually confirm the event has occurred.
- Hypertension is defined as having one or more of a number of criteria including: a diagnosis of hypertension recorded by the physician; antihypertensive medications prescribed; blood pressure >140/90mmHg or > 130/80 in patients with diabetes or renal disease and >125/75 in those with proteinuria.
- Diabetes is defined as having one or more of a number of criteria including a diagnosis of diabetes recorded by a physician; a fasting plasma glucose of >7.0 mmol/l or two-hour glucose level of >11.1 mmol/l following an oral glucose tolerance test.

- Left Ventricular Systolic Dysfunction (LVSD): A left ventricular ejection fraction (LVEF) less than 40%, or a narrative of left ventricular function consistent with moderate or severe systolic dysfunction. *ICD-10-CA code I51.8*

**Calculate as:**

Numerator / Denominator; as a percentage of AMI patients who are prescribed an ACE Inhibitor or ARB at hospital discharge.

## 5.0 ACE-Inhibitor or Angiotensin Receptor Blockers (ARB) Prescribed at Discharge – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) patients with Q-wave infarction, hypertension, diabetes or left ventricular systolic dysfunction who are prescribed an ACE-inhibitor or Angiotensin Receptor Blockers (ARB) at discharge from hospital.			
<b>Goal:</b>	≥85% (CCORT/CCS guidelines)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <b>Specify Region:</b>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Concurrent <input type="checkbox"/> Retrospective	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Denominator</b>			<b>Formula</b>	<b>Answer</b>
<p><b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of Acute Myocardial Infarction with Q-wave infarction, hypertension, diabetes or left ventricular systolic dysfunction. The diagnosis of AMI is confirmed by <b>two of:</b></p> <ul style="list-style-type: none"> <li>▪ EKG showing elevated ST segments in 2 contiguous leads or new LBBB;</li> <li>▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or</li> </ul> <p>documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.</p> <p><b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9</p> <p><b>General:</b> Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 meeting the criteria each month; first 5 meeting criteria between 0730-1530 + 1530-2330 + 2330-0730 etc</p>				
<b>5.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? (See definition above)			<b>5.1=</b>
<b>5.2</b>	What is the number of patients in # <b>5.1</b> whose age is less than 18 yrs on admission to hospital?			<b>5.2=</b>
<b>5.3</b>	Subtract the total of # <b>5.2</b> from the total of # <b>5.1</b> and enter here.		<b>(5.1 – 5.2 = )</b>	<b>5.3=</b>
<b>5.4</b>	What is the number of patients in # <b>5.3</b> transferred <b>out to</b> another acute care hospital <b>and not transferred back within 24 hours?</b>			<b>5.4=</b>
<b>5.5</b>	Subtract the total of # <b>5.4</b> from the total of # <b>5.3</b> and enter here.		<b>(5.3 – 5.4 = )</b>	<b>5.5=</b>
<b>5.6</b>	What is the number of patients in # <b>5.5</b> who expired <b>OR</b> left against medical advice?			<b>5.6=</b>

<b>5.7</b>	Subtract the total of # <b>5.6</b> from the total of # <b>5.5</b> and enter here.	<b>(5.5 – 5.6 = )</b>	<b>5.7=</b>	
<b>5.8</b>	What is the number of patients in # 5.7 with one or more documented ACE Inhibitor or Angiotensin Receptor Blocker contraindications including: Moderate or severe aortic stenosis; Allergy or intolerance to ACE inhibitors or ARBs; Severe renal dysfunction (i.e., peak or last prehospital discharge serum creatinine level >200 µmol/L); Systolic blood pressure <100 mmHg at discharge; Bilateral renal artery stenosis; Hyperkalemia (ie, peak or last prehospital discharge K+ >4.5 mmol/L); Physician documented reason for nonuse of ACE inhibitor or ARB at discharge (eg, patient refusal, symptomatic hypotension); Other reasons documented by a physician or nurse for not prescribing an ACE-I or ARB at discharge?		<b>5.8=</b>	
<b>5.9</b>	Subtract the total of # 5.8 from the total of # 5.7 and enter here.	<b>(5.7 – 5.8 = )</b>	<b>5.9=</b>	
<b>5.10</b>	Continue to select patients according to criteria 5.1 to 5.9 up to and including patient #15 (or the sample size selected by the hospital AMI team). Enter final sample number here.	<b>FINAL SAMPLE SIZE</b>	<b>5.10=</b>	
<b>Calculation of Numerator – Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>5.11</b>	What is the total number of patients in # <b>5.10</b> prescribed an ACE Inhibitor or ARB at discharge?		<b>5.11=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>5.12</b>	Divide # <b>5.11</b> by # <b>5.10</b> . Multiply by 100.	<b>(5.11 / 5.10) x 100</b>	<b>5.12=</b>	<b>%</b>

## 6.0 Adult Smoking (Cigarette, Cigar, or Pipe) Cessation Advice/Counselling and/or Pharmacologic Therapy – Technical Description

**Intervention(s):** Improved Care for Acute Myocardial Infarction

**Definition:** The percentage of AMI patients who receive smoking cessation advice, counselling and/or pharmacologic therapy and/or referral to cardiac rehabilitation program during hospital stay.

**Goal:** 100% (CCORT/CCS guidelines)

### Matches Existing Measures:

- JCAHO Core Measure AMI-4 (IHI)
- CMS 7th Scope of Work (IHI)
- National Quality Forum (IHI)

### CALCULATION DETAILS:

**Numerator Definition:** AMI patients (smokers) who receive smoking cessation advice, counselling, and/or pharmacological therapy during the hospital stay. Includes counselling provided to patients and family, pharmacological therapy (nicotine replacement, bupropion and serotonin reuptake inhibitors) as well as referral to smoking cessation programs and/or referral to cardiac rehabilitation program.

### Numerator Exclusions:

- Same as the denominator

### Denominator Definition:

- Concurrent analysis –
  - Patients admitted through Emergency with diagnosis of AMI **and**,
  - **Any two of:**
    - **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB **or**,
    - **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; **or**
    - **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction **and**,
  - History of smoking cigarettes, cigars or pipes anytime during the year prior to hospital arrival
- Retrospective analysis:
  - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9 **and**,
  - History of smoking cigarettes, cigars or pipes anytime during the year prior to hospital arrival

Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*.

### Denominator Exclusions:

- Patients less than 18 years of age
- Patients transferred out to another acute care hospital
- Patients who expired

- Patients who left against medical advice

### **Measurement Period Length and Sample Size:**

- **Concurrent Sampling:** Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. Be sure to select patients who have a **history of smoking cigarettes anytime during this year**. Clearly established criteria for what constitutes counselling for smoking cessation and/or pharmacologic intervention may be concurrently validated against the chart, Kardex, and discussions with the staff. If volume allows, SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly.
- **Retrospective Sampling:** With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged **alive** within this month with an ICD-10-CA MRDx of I21.0 – I21.9 and had a **history of smoking cigarettes anytime during the previous year**. It may be necessary to select more than 15 patient charts which meet the coding criteria in order to fulfill the smoking criterion for inclusion. Furthermore, the AMI Team should clearly specify the documentation required for smoking counselling and/or nicotine replacement in order to meet the criterion (see below). Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

### **Definition of Terms:**

- AMI Patients:
  - Patients identified **retrospectively** who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9.
  - Patients identified **concurrently** who are admitted through Emergency with diagnosis of AMI confirmed by **two** of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.
- Smoking: history of smoking cigarettes, cigars or pipes anytime during the year prior to hospital arrival
- Pharmacologic Intervention: nicotine replacement therapy, serotonin reuptake inhibitors or other drug therapy for withdrawal.
- Smoking cessation counselling: Involves a recognized program that may include patient video, information brochure or referral to formal program e.g. the Lung Association. Smoking cessation counselling is a component of cardiac rehabilitation. At discharge it is recommended that all AMI patients be referred to a multidisciplinary cardiac rehabilitation program or an appropriate medical ambulatory clinic which integrates cardiac rehabilitation care if available.

### **Calculate as:**

Numerator / Denominator; as a percentage of AMI patients with a history of smoking within this year who received counselling for smoking cessation and/or pharmacologic therapy during the hospital stay.

## 6.0 Adult Cigarette Smoking Cessation Advice/Counseling and/or Pharmacologic – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of AMI patients who receive smoking cessation advice, counselling and/or pharmacologic therapy and/or referral to cardiac rehabilitation program during hospital stay.			
<b>Goal:</b>	100% (CCORT/CCS guidelines)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <b>Specify Region:</b>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b>	<input type="checkbox"/> Concurrent <input type="checkbox"/> Retrospective
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Denominator</b>			<b>Formula</b>	<b>Answer</b>
<b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>two of:</b> ▪ <b>EKG</b> showing elevated ST segments in 2 contiguous leads or new LBBB; ▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.				
<b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9				
<b>General:</b> Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 meeting the criteria each month; first 5 meeting criteria between 0730-1530 + 1530-2330 + 2330-0730 etc.				
<b>6.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? (See definition above).			<b>6.1=</b>
<b>6.2</b>	What is the number of patients in # <b>6.1</b> whose age is less than 18 yrs on admission to hospital?			<b>6.2=</b>
<b>6.3</b>	Subtract the total of # <b>6.2</b> from the total of # <b>6.1</b> and enter here.		<b>(6.1 – 6.2 = )</b>	<b>6.3=</b>
<b>6.4</b>	What is the number of patients in # <b>6.3</b> transferred <b>out to</b> another acute care hospital or Emergency Department <b>and not transferred back within 24 hours?</b>			<b>6.4=</b>
<b>6.5</b>	Subtract the total of # <b>6.4</b> from the total of # <b>6.3</b> and enter here.		<b>(6.3 – 6.4 = )</b>	<b>6.5=</b>
<b>6.6</b>	What is the number of patients in # <b>6.5</b> who expired during the hospital stay?			<b>6.6=</b>
<b>6.7</b>	Subtract the total of # <b>6.6</b> from the total of # <b>6.5</b> and enter here.		<b>(6.5 – 6.6 = )</b>	<b>6.7=</b>
<b>6.8</b>	What is the number of patients in # <b>6.7</b> who left against medical advice?			<b>6.8=</b>
<b>6.9</b>	Subtract the total of # <b>6.8</b> from the total of # <b>6.7</b> and enter here.		<b>(6.7 – 6.8 = )</b>	<b>6.9=</b>
<b>6.10</b>	What is the number of patients in # <b>6.9</b> who had no history of smoking cigarettes, cigars or pipe anytime during the year prior to hospital arrival?			<b>6.10=</b>

<b>6.11</b>	Subtract the total of # <b>6.10</b> from the total of # <b>6.9</b> and enter here.	$(6.9 - 6.10 = )$	<b>6.11=</b>	
<b>6.12</b>	Continue to select patients according to criteria <b>6.1</b> to <b>6.11</b> up to and including patient #15 or the sample size selected by the hospital AMI team. Enter final sample number here.	<b>FINAL SAMPLE SIZE</b>	<b>6.12=</b>	
<b>Calculation of Numerator – Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>6.13</b>	What is the total number of patients in # <b>6.12</b> who received counselling for smoking cessation and/or pharmacologic intervention and/or referral to cardiac rehabilitation program during hospital stay as defined by the AMI team? (See 'Definition of Terms' above)		<b>6.13=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>6.14</b>	Divide # <b>6.13</b> by # <b>6.12</b> . Multiply by 100.	$(6.13 / 6.12) \times 100$	<b>6.14=</b>	%

## **7.0 Perfect Care for AMI – Technical Description**

**Intervention(s):** Improved Care for Acute Myocardial Infarction

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

**Goal:** 95% or more of all AMI receive all seven elements of the AMI Bundle in the absence of contraindications.

**Matches Existing Measures:** none

### **CALCULATION DETAILS:**

**Numerator Definition:** AMI patients who either received all of the following elements or had documentation of a contraindication to a medication, transferred in or out of the healthcare organization etc. The **AMI elements** for perfect care are:

- Early administration of aspirin
- Aspirin at discharge
- Beta Blocker prescribed at discharge
- Timely administration of thrombolytics **or** percutaneous coronary intervention (PCI)
- ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge
- Smoking cessation counselling and or Pharmacologic therapy
- Statins at discharge

#### **Numerator Exclusions:**

- Same as the denominator

#### **Denominator Definition:**

- Concurrent analysis – Patients admitted through Emergency with diagnosis of AMI confirmed by two of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.
- Retrospective analysis - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9. Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*

#### **Denominator Exclusions:**

- Patients less than 18 years of age
- Death in emergency department
- Transferred in or out and not returned to the hospital of origin within 24 hours unless there is an agreement between hospitals or within regions regarding which hospital will count these patients

#### **Measurement Period Length and Sample Size:**

Concurrent Sampling: Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. If volume allows SHN recommends obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This

is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly.

Retrospective Sampling: With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged within this month with an ICD-10-CA MRDx of I21.0 – I21.9. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

**Definition of Terms:**

- AMI Patients:
  - Patients identified concurrently who are admitted through Emergency with diagnosis of AMI confirmed by two of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.
  - Patients identified retrospectively who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9.

**Calculate as:**

Numerator / Denominator; as a percentage of AMI patients receiving perfect care – all components provided (see below) or documented as contraindicated.

**Comments:**

Perfect care for AMI is defined as the 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. **All patients with contraindications to a medication, transferred in or out of the healthcare organization etc. are considered to have met the inclusion criteria for Perfect Care.**

**Note: 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.

## 7.0 Perfect Care for AMI – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>	Improved Care for Acute Myocardial Infarction			
<b>Definition:</b>	The percentage of acute myocardial infarction (AMI) patients who received all seven appropriate AMI evidence-based elements.			
<b>Goal:</b>	95% or more of all AMI receive all six elements of the AMI Bundle in the absence of contraindications.(IHI?)			
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <b>Specify Region:</b>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Concurrent <input type="checkbox"/> Retrospective	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Denominator</b>			<b>Formula</b>	<b>Answer</b>
<p><b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>two of:</b></p> <ul style="list-style-type: none"> <li>▪ EKG showing elevated ST segments in 2 contiguous leads or new LBBB;</li> <li>▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or</li> </ul> <p>documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.</p> <p><b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9</p> <p><b>General:</b> Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 meeting the criteria each month; first 5 meeting criteria between 0730-1530 + 1530-2330 + 2330-0730 etc</p>				
<b>7.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? (See definition above)			<b>7.1=</b>
<b>7.2</b>	What is the number of patients in # 7.1 whose age is less than 18 yrs on admission to hospital?			<b>7.2=</b>
<b>7.3</b>	Subtract the total of # 7.2 from the total of # 7.1 and enter here.		<b>(7.1 – 7.2=)</b>	<b>7.3=</b>
<b>7.4</b>	What is the number of patients in # 7.3 who expired in the Emergency Department OR were <b>transferred in or out</b> and not returned to the hospital of origin within 24 hours unless there is an agreement between hospitals or within regions regarding which hospital will count these patients?			<b>7.4=</b>
<b>7.5</b>	Subtract the total of # 7.4 from the total of # 7.3 and enter here.		<b>(7.3 – 7.4=)</b>	<b>7.5=</b>
<b>7.6</b>	Continue to select patients according to criteria 7.1 to 7.5 up to and including patient #15 or the sample size selected by the hospital AMI team. Enter final sample number here.			<b>7.6=</b>

<b>Calculation of Numerator - Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>7.7</b>	What is the total number of patients in #7.6 whom received all of the following six elements or had documented contraindications or due to hospital transfer received those for which they were eligible? (Use AMI element Checklist)  <b>Perfect Care for AMI Elements:</b> <ol style="list-style-type: none"> <li>1) Early administration of aspirin, <b>and...</b></li> <li>2) Aspirin at discharge, <b>and...</b></li> <li>3) Beta Blocker prescribed at discharge <b>and...</b></li> <li>4) Timely administration of thrombolytics or percutaneous coronary intervention (PCI) <b>and...</b></li> <li>5) ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge <b>and...</b></li> <li>6) Smoking cessation counselling and/or pharmacological intervention and/or referral to cardiac rehabilitation program and....</li> <li>7) Statins at discharge</li> </ol>		<b>7.7=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>7.8</b>	Divide # 7.7 by #7.6. Multiply by 100.	$(7.7 / 7.6) \times 100$	<b>7.8=</b>	%

## **8.0 AMI Inpatient Mortality – Technical Description**

**Intervention(s):** Improved Care for Acute Myocardial Infarction

**Definition:** The percentage of acute myocardial infarction (AMI) patients who died during hospital stay.

**Goal:** Decrease by 25%

**Matches Existing Measures:** none

### **CALCULATION DETAILS:**

**Numerator Definition:** AMI patients who died during the hospital stay.

**Numerator Exclusions:**

- Same as the denominator

**Denominator Definition:**

- Retrospective analysis - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9.

**Denominator Exclusions:**

- Patients less than 18 years of age
- Patients transferred **in from** another acute care hospital, including another emergency department.
- Patients transferred **out to** another acute care hospital
- Patients less than 18 years of age
- Death in emergency department

**Measurement Period Length and Sample Size:**

- Concurrent Sampling for this measure is challenging.
- Retrospective Sampling: With the support of your Health Records Department staff select a sample of all AMI patients discharged within this month with an ICD-10-CA MRDx of I21.0 – I21.9. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

**Definition of Terms:**

- AMI Patients:
  - Patients identified retrospectively who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9.

**Calculate as:**

Numerator / Denominator; as a percentage of AMI mortality.

**Comments:**

Use the analytical capacity and support of your Health Records Department to determine the AMI admission and mortality rate for the preceding month. Although CIHI may be able to calculate this measure on your behalf coding practice and data submission may delay this process.

This is a useful measure to teams which are interested in monitoring their own performance improvement against baseline in a timely fashion.  
**The AMI faculty recommends you monitor your AMI inpatient mortality every month.**

## 8.0 AMI Inpatient Mortality – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>		Improved Care for Acute Myocardial Infarction		
<b>Definition:</b>		The percentage of acute myocardial infarction (AMI) patients who died during hospital stay.		
<b>Goal:</b>		Reduce percentage of AMI patients who died during hospital stay by 25%.		
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <b>Specify Region:</b>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission:</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b>	<input type="checkbox"/> Concurrent <input type="checkbox"/> Retrospective
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Calculation of Denominator -</b>			<b>Formula</b>	<b>Answer</b>
<b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>two of:</b> ▪ EKG showing elevated ST segments in 2 contiguous leads or new LBBB; ▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.				
<b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9.				
<b>8.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? (See definition above)? (Calculate this measure with the assistance of your Health Records Department)			<b>8.1=</b>
<b>8.2</b>	What is the total number of patients in # 8.1 whose age was less than 18 yrs on admission to hospital? Exclude from patient list for calculating AMI Inpatient Mortality.			<b>8.2=</b>
<b>8.3</b>	Subtract the total of # 8.2 from the total of # 8.1 and enter here.		<b>(8.1 - 8.2 = )</b>	<b>8.3=</b>
<b>8.4</b>	What is the total number of patients in # 8.3 transferred <b>in from</b> another acute care hospital or emergency department <b>and not transferred back within 24 hours</b> ? Exclude from patient list for calculating AMI Inpatient Mortality.			<b>8.4=</b>
<b>8.5</b>	Subtract the total of # 8.4 from the total of # 8.3 and enter here.		<b>(8.3 - 8.4 = )</b>	<b>8.5=</b>
<b>8.6</b>	What is the total number of patients in # 8.5 transferred <b>out to</b> another acute care hospital on the day of arrival <b>and not transferred back within 24 hours</b> ? Exclude from patient list for calculating AMI Inpatient Mortality.			<b>8.6=</b>
<b>8.7</b>	Subtract the total of # 8.6 from the total of # 8.5 and enter here.		<b>(8.5 - 8.6 = )</b>	<b>8.7=</b>
<b>8.8</b>	What is the total number of patients in # 8.7 who died in the Emergency Department? Exclude from patient list for calculating AMI Inpatient Mortality.			<b>8.8=</b>
<b>8.9</b>	Subtract the total of # 8.8 from the total of # 8.7 and enter here.		<b>(8.7 - 8.8 = )</b>	<b>8.9=</b>
<b>Calculation of Numerator – Retrospective</b>			<b>Formula</b>	<b>Answer</b>
<b>8.10</b>	What is the total number of patients in # 8.9 who died during the hospital stay?			<b>8.10=</b>

<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>8.11</b>	Divide # <b>8.10</b> by # <b>8.9</b> . Multiply by 100.	$(8.10 / 8.9) \times 100 =$	<b>8.11=</b>	%

## **9.0 Statins Prescribed at Discharge – Technical Description**

**Intervention(s):** Improved Care for Acute Myocardial Infarction

**Definition:** The percentage of acute myocardial infarction (AMI) patients who were prescribed a Statin at discharge from hospital.

**Goal:** 95%

**Matches Existing Measures:** none

### **CALCULATION DETAILS:**

**Numerator Definition:** AMI patients who are prescribed a Statin at hospital discharge.

**Numerator Exclusions:**

- Same as the denominator

**Denominator Definition:**

- Concurrent analysis – Patients admitted through Emergency with diagnosis of AMI confirmed by two of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.
- Retrospective analysis - Patients with an ICD-10-CA Most Responsible Diagnosis (MRDx) of I21.0 – I21.9. Some facilities may wish to apply these guidelines to a broader group of cardiac patients (for example, to patients with acute coronary syndrome – ACS). While this can be done at a facility level, please ensure that only confirmed AMI cases are included in measurements for *Safer Healthcare Now!*.

**Denominator Exclusions:**

- Patients less than 18 years of age
- Patients transferred to another acute care hospital
- Patients who expired
- Patients who left against medical advice
- Patients with a chart documentation of participation in clinical trials testing alternatives to Statins as first-line therapy
- Patients with one or more of the following Statin contraindications/reasons for not prescribing statins documented in the medical record:
  - Active liver disease
  - Allergy or intolerance to Statins
  - CK >10 times upper limit of normal
  - Persistent unexplained elevations in serum transaminase (ALT or AST) to <3 times upper limit of normal
  - Hypersensitivity to a Statin
  - Pregnancy and lactation
  - Physician documented reason for nonuse of Statin at discharge (eg, patient refusal)

**Measurement Period Length and Sample Size:**

- Concurrent Sampling: Select **15 consecutive** AMI patients as defined above, each month if AMI volume at your institution makes this possible. If volume allows, SHN recommends

obtaining a weekly sample of patients that meet the concurrent or retrospective definitions for AMI. Rotate the day and time of weekly sampling strategy and be sure to include weekends and nights. This is an on-going weekly measure. Hospitals with a lower AMI volume may have to select the sample over a 3-month period, reporting quarterly.

- **Retrospective Sampling:** With the support of your Health Records Department staff select a sample of **15 consecutive** AMI patients discharged **alive** within this month with an ICD-10-CA MRDx of I21.0 – I21.9. Patient volume, coding practices and policies regarding completing charts may make it difficult to select this sample from this month making it necessary to select the sample over a 3-month period and reporting quarterly.

- 

**Definition of Terms:**

- Hospital Discharge: The documented date that the patient left the hospital;
- AMI Patients:
  - Patients identified retrospectively who at discharge had an ICD-10-CA Most Responsible Diagnosis (MRD) of I21.0 – I21.9.
  - Patients identified concurrently who are admitted through Emergency with diagnosis of AMI confirmed by two of **EKG** showing elevated ST segments in 2 contiguous leads or new LBBB; documented **Symptoms** compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or documented **Enzyme** elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial.

**Calculate as:**

Numerator / Denominator; as a percentage of AMI patients who are prescribed a Statin at hospital discharge.

## 9.0 Statin Prescribed at Discharge (Concurrent) – Measurement Worksheet

<b>Improved Care for Acute Myocardial Infarction</b>				
<b>Intervention:</b>		Improved Care for Acute Myocardial Infarction		
<b>Definition:</b>		The percentage of acute myocardial infarction (AMI) who are prescribed a Statin at discharge from hospital.		
<b>Goal:</b>		95%(?IHI)		
<b>Data Collection Details</b>				
<b>Hospital Name:</b>			<b>Health Region:</b> <input type="checkbox"/> NA or <b>Specify Region:</b>	
<b>Completed by:</b>	<b>Name:</b>	<b>E-mail Address:</b>	<b>Phone Number:</b> ( ) -	<b>Date of Submission</b>
<b>Year:</b>	Indicate the year for which the data was collected: <input type="checkbox"/> 2004 <input type="checkbox"/> 2005 <input type="checkbox"/> 2006 <input type="checkbox"/> 2007 <input type="checkbox"/> 2008 <input type="checkbox"/> Other (specify):		<b>Collection Method:</b> <input type="checkbox"/> Concurrent	
<b>Month:</b>	Indicate the month for which the data was collected: <input type="checkbox"/> Jan. <input type="checkbox"/> Feb. <input type="checkbox"/> Mar. <input type="checkbox"/> Apr. <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug. <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.			
<b>Implementation Stage:</b>	<input type="checkbox"/> Baseline Stage (Pre-intervention)	<input type="checkbox"/> Early implementation stage (Some team members in selected unit(s) have begun implementing AMI bundle)	<input type="checkbox"/> Full implementation stage (All team members in selected unit(s) are consistently implementing AMI bundle)	
<b>Patient Sample:</b> 1 worksheet/sample	Describe the source of the patient sample.			
<b>Additional Information:</b>	Describe any other pertinent information here, including Team # if there is more than one AMI team in your hospital			
	<b>Team #:</b> <input type="checkbox"/> N/A	<b>Comments:</b>		
<b>Selection of Monthly Sample – Denominator</b>			<b>Formula</b>	<b>Answer</b>
<p><b>Identifying patients for inclusion for Concurrent data collection:</b> Of patients admitted through the Emergency Department, include only those with a diagnosis of AMI confirmed by <b>two of:</b></p> <ul style="list-style-type: none"> <li>▪ EKG showing elevated ST segments in 2 contiguous leads or new LBBB;</li> <li>▪ documented <b>Symptoms</b> compatible with an AMI e.g. chest pain, diaphoresis, gray pallor etc.; or</li> </ul> <p>documented <b>Enzyme</b> elevation e.g. CK, CK-MB or Troponin (I or T) compatible with acute myocardial infarction.</p> <p><b>Identifying patients for inclusion for Retrospective Collection:</b> The number of patients in this month with a Most Responsible Diagnosis of ICD-10-CA MRDx of I21.0 – I21.9</p> <p><b>General:</b> Determine process your team wishes to use for concurrent selection of patients sample e.g., first 15 meeting the criteria each month; first 5 meeting criteria between 0730-1530 + 1530-2330 + 2330-0730 etc</p>				
<b>9.1</b>	What is the number of patients with a diagnosis of acute myocardial infarction (AMI) this month? (See definition above)			<b>9.1=</b>
<b>9.2</b>	What is the number of patients in # <b>9.1</b> whose age is less than 18 yrs on admission to hospital?			<b>9.2=</b>
<b>9.3</b>	Subtract the total of # <b>9.2</b> from the total of # <b>9.1</b> and enter here.		<b>(9.1 – 9.2 = )</b>	<b>9.3=</b>
<b>9.4</b>	What is the number of patients in # <b>9.3</b> transferred <b>out to</b> another acute care hospital <b>and not transferred back within 24 hours?</b>			<b>9.4=</b>
<b>9.5</b>	Subtract the total of # <b>9.4</b> from the total of # <b>9.3</b> and enter here.		<b>(9.3 – 9.4 = )</b>	<b>9.5=</b>
<b>9.6</b>	What is the number of patients in # <b>9.5</b> who expired <b>OR</b> left against medical advice?			<b>9.6=</b>
<b>9.7</b>	Subtract the total of # <b>9.6</b> from the total of # <b>9.5</b> and enter here.		<b>(9.5 – 9.6 = )</b>	<b>9.7=</b>
<b>9.8</b>	What is the total number of patients in # <b>9.7</b> with one or more documented			<b>9.8=</b>

	<p>Statin contraindications including: Active liver disease; Allergy or intolerance to Statins; CK &gt;10 times upper limit of normal; Persistent unexplained elevations in serum transaminase (ALT or AST) to &lt;3 times upper limit of normal; Hypersensitivity to a statin; Pregnancy and lactation; Physician documented reason for nonuse of Statins at discharge (eg, patient refusal); Other reasons documented by a physician or nurse for not prescribing a ACE-I or ARB at discharge?  <i>Exclude from patient list for calculating Rate of Statins at discharge.</i></p>			
<b>9.9</b>	Subtract the total of # <b>9.8</b> from the total of # <b>9.7</b> and enter here.	$(9.7 - 9.8 = )$	<b>9.9=</b>	
<b>9.10</b>	Continue to select patients according to criteria <b>9.1</b> to <b>9.9</b> up to and including patient #15 (or the sample size selected by the hospital AMI team). Enter final sample number here.	<b>FINAL SAMPLE SIZE</b>	<b>9.10=</b>	
<b>Calculation of Numerator – Concurrent</b>		<b>Formula</b>	<b>Answer</b>	
<b>9.11</b>	What is the total number of patients in # <b>9.10</b> prescribed a Statin at discharge?		<b>9.11=</b>	
<b>Final Calculation</b>		<b>Formula</b>	<b>Answer</b>	
<b>9.12</b>	Divide # <b>9.11</b> by # <b>9.10</b> . Multiply by 100.	$(9.11 / 9.10) \times 100$	<b>9.12=</b>	%

## APPENDIX B: Sample Data Collection Forms

### Sample Data Collection Form

#### AMI Diagnostic Criteria

- This patient has had an acute myocardial infarction (AMI) or heart attack
- This patient had an ST elevation or LBBB on ECG

#### *For ST elevation MI patients only*

- |                                |                              |                             |  |
|--------------------------------|------------------------------|-----------------------------|--|
| Thrombolysis within 30 minutes | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> contraindicated |
| PCI within 90 minutes          | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> contraindicated |

#### *For all heart attack patients*

#### Early measures

This patient received the following care during the specified time frames after arrival at the hospital:

- |                         |                              |                             |  |
|-------------------------|------------------------------|-----------------------------|--|
| Aspirin within 24 hours | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> contraindicated |
|-------------------------|------------------------------|-----------------------------|--|

#### Medications at discharge

This patient has been prescribed the following medications (or counselled to continue this medication if taking pre-arrival)

- |                   |                              |                             |  |
|-------------------|------------------------------|-----------------------------|--|
| Aspirin           | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> contraindicated |
| ACE inhibitor/ARB | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> contraindicated |
| Beta Blocker      | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> contraindicated |
| Statin            | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> contraindicated |

#### Pharmacological therapy

- |                      |                              |                             |
|----------------------|------------------------------|-----------------------------|
| Nicotine Replacement | <input type="checkbox"/> yes | <input type="checkbox"/> no |
|----------------------|------------------------------|-----------------------------|

#### Non-pharmacological therapy

This patient has been counseled to stop smoking

- |                              |                             |   |
|------------------------------|-----------------------------|---|
| <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> not a smoker (no smoking in past year) |
|------------------------------|-----------------------------|---|

PATIENT IDENTIFICATION	
Method of patient selection: <input type="checkbox"/> Retrospective <input type="checkbox"/> Concurrent	Pt. ID/ Bradma
Admitted to: <input type="checkbox"/> CCU <input type="checkbox"/> ICU/CCU <input type="checkbox"/> Ward <input type="checkbox"/> Other	
Age $\geq$ 18 years old <input type="checkbox"/> No <input type="checkbox"/> Yes	
History of Cigarette Smoking: <input type="checkbox"/> No <input type="checkbox"/> Yes	

RETROSPECTIVE CRITERIA FOR INCLUSION	<i>With the support of your Health Records Department staff select patients discharged within this month with an ICD-10-CA MRDx of I21.0 – I21.9.</i>
--------------------------------------	---

CONCURRENT CRITERIA FOR INCLUSION	<i>Of patients admitted through the Emergency Department include only those with a diagnosis of AMI confirmed by <b>two of</b></i>
EKG on Admission: <input type="checkbox"/> elevated ST segments in 2 contiguous leads <input type="checkbox"/> Left Bundle Branch Block (LBBB)	
SYMPTOMS on Admission documented as compatible with AMI: <input type="checkbox"/> No <input type="checkbox"/> Yes	
ENZYME elevation on Admission (e.g.,CK-MB or Troponin) documented as compatible with AMI: <input type="checkbox"/> No <input type="checkbox"/> Yes	

PATIENT HISTORY - ADMISSION				
ARRIVAL EMERG DEPT	Date of Arrival in ED: (dd/MMM/yyyy)___/___/___		Time of Arrival in ED: ____ : ____	
ADMISSION TO HOSPITAL	Date of Admission to Hospital: (dd/MMM/yyyy)___/___/___		Time of Admission: ____ : ____	
Electrocardiogram	Date of earliest ECG on Arrival: (dd/MMM/yyyy)___/___/___		Time of ECG: ____ : ____	
Admit ECG	<input type="radio"/> No ACS ST-T changes <input type="radio"/> New LBBB <input type="radio"/> Atr. Fib <input type="radio"/> Paced <input type="radio"/> Other(specify):_____			
	I aVL	$\theta$ ST $\uparrow$ $\theta$ ST $\downarrow$ $\theta$ T $\downarrow$ $\theta$ Q wave	V <sub>1</sub> – V <sub>4</sub>	$\theta$ ST $\uparrow$ $\theta$ ST $\downarrow$ $\theta$ T $\downarrow$ $\theta$ Q wave
	II/III aVF	$\theta$ ST $\uparrow$ $\theta$ ST $\downarrow$ $\theta$ T $\downarrow$ $\theta$ Q wave	V <sub>5</sub> – V <sub>6</sub>	$\theta$ ST $\uparrow$ $\theta$ ST $\downarrow$ $\theta$ T $\downarrow$ $\theta$ Q wave
CHEST PAIN (within 48°):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Hx CP	Date of Onset: (dd/MMM/yyyy)___/___/___	Time of Onset: ____ : ____	
ENZYMES	Peak CK	Peak CK-MB	Peak Troponin	
Result	N/R	N/R    %	N/R	
Upper Limit of Normal	N/R	N/R    %	N/R	
Other	Left Ventricular Systolic Dysfunction (LVEF <40%): <input type="checkbox"/> No <input type="checkbox"/> Yes			

Treatment on Arrival			
ASA	<input type="checkbox"/> Before Arrival <input type="checkbox"/> After Arrival <input type="checkbox"/> Contraindicated <input type="checkbox"/> Not given	If 'Before': Given by whom: <input type="checkbox"/> Patient at home <input type="checkbox"/> EMS en route	
	Date of ASA: (dd/MMM/yyyy)___/___/___	Time of ASA: ____ : ____	
Thrombolytic Therapy	<input type="checkbox"/> No <input type="checkbox"/> Yes	Date of Thrombolysis: dd/MMM/yyyy)___/___/___	Time of Thrombolysis: ____ : ____
PCI performed	<input type="checkbox"/> No <input type="checkbox"/> Yes	Date of PCI: dd/MMM/yyyy)___/___/___	Time of PCI (1sr Inflation) : ____ : ____

Treatment at Discharge	
ASA	Ordered: <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Contraindicated
Beta Blocker	Ordered: <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Contraindicated
ACE Inhibitor	Ordered: <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Contraindicated
Angiotensin Receptor Blocker	Ordered: <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Contraindicated
Statin	Ordered: <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Contraindicated

Medication Contraindications	
ASA (select all that apply)	<input type="checkbox"/> ASA Allergy <input type="checkbox"/> Active bleeding on arrival or within 24 hours after arrival or on discharge <input type="checkbox"/> Coumadin/warfarin as pre-arrival medication or at discharge <input type="checkbox"/> Other reason documented by physician or nurse for not giving ASA within 24 hours before, after hospital arrival or on discharge.
Beta Blocker	<input type="checkbox"/> Beta Blocker Allergy <input type="checkbox"/> Bradycardia (heart rate less than 50 bpm) on day of discharge or day prior to discharge while not on beta a blocker <input type="checkbox"/> Moderate or severe left ventricular failure <input type="checkbox"/> Systolic blood pressure less than 90 mm Hg on day of discharge or day prior to discharge while not on beta blocker <input type="checkbox"/> PR-interval on the electrocardiogram >0.24 seconds <input type="checkbox"/> Active asthma/reactive airways disease <input type="checkbox"/> Other reason documented by physician or nurse for not giving a Beta Blocker within 24 hours after hospital arrival or at discharge.
ACE Inhibitor / ARB	<input type="checkbox"/> Allergy or intolerance to ACE inhibitors or ARBs <input type="checkbox"/> Moderate or severe aortic stenosis <input type="checkbox"/> Severe renal dysfunction (i.e., peak or last prehospital discharge serum creatinine level >200 µmol/L) <input type="checkbox"/> Systolic blood pressure <100 mmHg at discharge <input type="checkbox"/> Bilateral renal artery stenosis <input type="checkbox"/> Hyperkalemia (ie, peak or last prehospital discharge K+ >4.5 mmol/L) <input type="checkbox"/> Physician documented reason for nonuse of ACE inhibitor at discharge (eg, patient refusal, symptomatic hypotension)
Statin	<input type="checkbox"/> Active liver disease <input type="checkbox"/> Allergy or intolerance to Statins <input type="checkbox"/> Persistent unexplained elevations in serum transaminase to <3 times upper limit of normal <input type="checkbox"/> Hypersensitivity to a Statin <input type="checkbox"/> Pregnancy and lactation <input type="checkbox"/> Physician documented reason for nonuse of Statin at discharge (eg, patient refusal)

COUNSELLING	
Smoking Cessation <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> UTD <input type="checkbox"/> N/A	If 'Yes' Format: <input type="checkbox"/> Brochure <input type="checkbox"/> Video <input type="checkbox"/> Discussion w/ Md or RN <input type="checkbox"/> National Program e.g. Lung Assoc.
Nicotine Replacement Ordered: <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> NA	Serotonin Reuptake Inhibitor Ordered: <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> NA

DISCHARGE	
Date of Discharge: (dd/MMM/yyyy)___/___/___	Discharge Status: <input type="checkbox"/> Dead <input type="checkbox"/> Alive
Discharge to: <input type="checkbox"/> Acute Care <input type="checkbox"/> I/P Rehab <input type="checkbox"/> L-T Care <input type="checkbox"/> CC Care <input type="checkbox"/> Home <input type="checkbox"/> Home Care	

**SAMPLE DATA COLLECTION FORMS**

ALAMANCE REGIONAL MEDICAL CENTER

ADDRESSOGRAPH

**CONCURRENT ACUTE CORONARY SYNDROME DOCUMENTATION ALGORITHM**

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

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 change 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 24 hour post-arrival?  Yes  No Date: \_\_\_\_\_ Time: \_\_\_\_\_

Contraindication to Beta-blocker 24 hour post arrival?  Yes  No

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

- HR <60 on arrival
- Heart Failure on arrival
- 2<sup>nd</sup> or 3<sup>rd</sup> 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 / Date Beta Blocker given** \_\_\_\_\_

**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 C: Sample Clinical Documentation, Concurrent Audit & Data Source Tool



Atlantic Health Sciences Corporation  
 Corporation des sciences de la santé de l'Atlantique

### COLLABORATIVE PLAN FOR IMPROVED AMI & ACS CARE

PATIENT IDENTIFICATION	PERMANENT PATIENT RECORD
<b>AFFIX PATIENT LABEL or</b>	
Name: _____	Transferred in from another ED/UCC <input type="checkbox"/> Yes <input type="checkbox"/> No
PPRN # _____	Transferred out to another ED/UCC <input type="checkbox"/> Yes <input type="checkbox"/> No
Medicare # _____	Admitted to: <input type="checkbox"/> CCU <input type="checkbox"/> ICU <input type="checkbox"/> Ward <input type="checkbox"/> _____
Registration Date to ED: _____	Age > 18 years old <input type="checkbox"/> Yes <input type="checkbox"/> No
	History of tobacco use in past year: <input type="checkbox"/> Yes <input type="checkbox"/> No
POINT OF ENTRY: EMS ( EMERGENCY MEDICAL SERVICE )	
Patient contact at _____ hrs.	EMS Master Incident # _____
Onset of relevant cardiac symptoms at _____ hrs.	Section Completed by: _____
Arrived hospital at _____ hrs.	ECG Interpreting Physician _____
1 <sup>st</sup> 12- lead ECG at _____ hrs. Sent or reported to ED at _____ hrs. Lytic Eligible? <input type="checkbox"/> Yes <input type="checkbox"/> No	
2 <sup>nd</sup> 12-Lead ECG at _____ hrs. Sent or reported to ED at _____ hrs. Lytic Eligible? <input type="checkbox"/> Yes <input type="checkbox"/> No	
ASA administered at home <input type="checkbox"/> by patient at _____ hrs. <input type="checkbox"/> by Paramedic at _____ hrs. <input type="checkbox"/> Contraindications	
POINT OF ENTRY: EMERGENCY DEPARTMENT	
Onset of relevant cardiac symptoms at _____ hrs.	<b>Admitting Dx.</b> <input type="checkbox"/> STEMI <input type="checkbox"/> NSTEMI <input type="checkbox"/> Angina <input type="checkbox"/> Other _____  Section completed by: _____
*Time seen by Triage/Charge/ED Nurse _____ hrs.	
Time of 1st Hospital 12- ECG _____ hrs.	
Signed by physician <input type="checkbox"/> Yes	
Time from arrival to 1st ECG _____ min.	
Time of Initial Assessment By Physician _____ hrs.	
Time of diagnostic (STEMI) ECG if not the 1st ECG _____ hrs.	
ASA within 24 hours <input type="checkbox"/> Yes <input type="checkbox"/> No. Given in ED <input type="checkbox"/> Yes <input type="checkbox"/> No	
If not, why not? <input type="checkbox"/> Already taken <input type="checkbox"/> Contraindicated	
Thrombolytic Therapy given? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If not, why not? <input type="checkbox"/> NSTEMI <input type="checkbox"/> Late Presentation <input type="checkbox"/> To Cath Lab	
<input type="checkbox"/> Refused <input type="checkbox"/> Other Time started _____ hrs.	
Initial Nursing Assessment time (*) to needle time (Lytics) mins.	
Less than 30 min. <input type="checkbox"/> Yes <input type="checkbox"/> No	
To Cath Lab Date: _____ Time: _____ hrs.	

3/058 (m/06)

<b>CATH LAB</b>	<b>CARDIAC CATH LAB</b>	
	<p><b>FROM ED</b>                  Arrived in Cath Lab Date: _____ Time: _____                  Time of 1st coronary intervention (aspiration cath, balloon inflation, primary stent deployment) _____ Hrs.                  PCI performed? <input type="checkbox"/> Yes <input type="checkbox"/> No.                  *FOR STEMI PATIENTS: Time seen by nurse in ED to 1st coronary intervention time _____ mins. Less than 90 min? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><b>FROM INPATIENT UNIT</b>                  PCI performed? <input type="checkbox"/> Yes <input type="checkbox"/> No                  Date: _____ Time: _____                  Section Completed by: _____</p>

Is Diagnosis Non Cardiac?  Yes **IF YES Do Not Complete Remainder of Form**


<b>PHYSICIAN</b>	<b>PHYSICIAN RX AT DISCHARGE FROM CCU/SDU/ICU/OTHER CARE AREA</b>	
	ASA	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy <input type="checkbox"/> Active bleeding <input type="checkbox"/> Warfarin <input type="checkbox"/> Other
	Beta Blocker	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy <input type="checkbox"/> Bradycardia <input type="checkbox"/> LV failure <input type="checkbox"/> SBP < 90 mm Hg <input type="checkbox"/> PR-interval > 0.24 sec. <input type="checkbox"/> Active asthma/reactive airways disease <input type="checkbox"/> Other
	ACE Inhibitor/ARB Echo done <input type="checkbox"/> Yes <input type="checkbox"/> No LVEF < 40% <input type="checkbox"/> Yes <input type="checkbox"/> No	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy or intolerance <input type="checkbox"/> Mod. Or severe AS <input type="checkbox"/> Creatinine >200 µmol/L <input type="checkbox"/> Not Indicated <input type="checkbox"/> SBP <100 mmHg <input type="checkbox"/> Bilateral renal artery stenosis <input type="checkbox"/> K+ >4.5 mmol/L <input type="checkbox"/> Other
	Lipid Lowering Medication	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> At Target Level <input type="checkbox"/> Intolerance <input type="checkbox"/> CK > 10 x upper limit <input type="checkbox"/> ALT/AST > 3 x upper limit <input type="checkbox"/> Other
	Clopidogrel	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy or intolerance <input type="checkbox"/> Not indicated <input type="checkbox"/> Other
	Nitroglycerine PRN	Ordered on D/C: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not?
	Nicotine Replacement Therapy Given as inpatient <input type="checkbox"/> Yes <input type="checkbox"/> No	Ordered on D/C: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Non-smoker <input type="checkbox"/> Allergy or intolerance <input type="checkbox"/> Refused <input type="checkbox"/> Other cessation medication given Smoking Cessation Counseling given <input type="checkbox"/> Yes <input type="checkbox"/> No
Cardiac Rehab	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not?	
Diagnosis	<input type="checkbox"/> STEMI <input type="checkbox"/> NSTEMI <input type="checkbox"/> Angina <input type="checkbox"/> CABG <input type="checkbox"/> Other	

<b>NURSING</b>	<b>NURSING COUNSELLING INPATIENT AND ON DISCHARGE</b>		
	Inpatient Dietary information given?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Refused
	Inpatient Cardiac Teaching Done?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Refused
	Has patient used a tobacco product in the past 12 months? If 'yes' was the following offered to the patient?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Clinical Tobacco Intervention (Ask, Advise & Assist) initiated?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Refused	
<b>DISCHARGE INFORMATION</b>			
Date of Discharge: mm____dd____yr_____		Transferred Out <input type="checkbox"/> Yes <input type="checkbox"/> No	
To home hospital <input type="checkbox"/> Yes <input type="checkbox"/> No		Transfer Date mm____dd____yr_____	
Left Against Medical Advice <input type="checkbox"/> Yes <input type="checkbox"/> No Deceased <input type="checkbox"/> Yes <input type="checkbox"/> No Completed by: _____			

Contact 648-6201 with questions. For Study Coordinator Use: ASA on Arrival  Yes  No  NA/ ASA on D/C  Yes  No  NA/ BB on D/C  Yes  No  NA/ ACE/ARB on D/C  Yes  No  NA/ Lytics or PCI  Yes  No  NA/ Smoking couns.  Yes  No  NA Perfect Care

## APPENDIX D: Smoking Cessation Tools

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**STAGE 1: Precontemplation**

### *Not Thinking about Quitting*

Quitting smoking is the single most effective thing you can do to improve the quality and length of your life.

Think about why you smoke:

Is it worth your health?

YES     NO


### **STAGE 2: Contemplation**

### *Thinking About Quitting*


People often have mixed feelings about quitting. Most people try several times before quitting for good.

Is there anyway at all your life would be better if you quit smoking?

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**STAGE 3: Preparation**

### *Getting Ready to Quit*

You plan to quit within the next 30 days. Things to consider if you want to quit smoking:

- Know your reasons for quitting
  - Make it your decision to quit
  - Set a quit date
  - Discuss your decision with your physician or health care provider. Ask about medication that may help you to quit.
  - Participate in individual, group, telephone, or web smoking cessation programs
  - Eat well
  - Drink plenty of water and fluids
  - Exercise regularly
  - Reward yourself for steps in the right direction
- 
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**STAGE 4: Action**


### *Quitting*

Thousands of Canadians successfully quit every year. YOU CAN DO IT! Five (5) steps to success:

1. Know your nicotine triggers and plan to handle them.
2. You can QUIT. A cigarette cannot control your life and health.
3. Be prepared to deal with withdrawal symptoms such as cravings, irritability, headache and change in appetite. Remember these only last a few days and treatment is available.
4. On your quit day, plan to do something special for yourself. Avoid triggers.
5. Congratulate yourself. If you slip, try again.

*Success is not found in how many times we fall but in how many times we get back up.*

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**STAGE 5: Maintenance**

*Staying Quit*

Staying smoke free and dealing with relapse.

1. Remember your reasons to quit
2. If you have a slip, learn from it and make a plan to deal with it better next time.
3. Remember urges will pass whether or not you smoke. Remove or avoid temptations
4. Use available help :
  - ⇒ Addiction Services Smoking Cessation Groups
  - ⇒ Nicotine replacement
  - ⇒ Canadian Cancer Society "Steps" booklet
  - ⇒ Physicians, nurses and other health care providers.

The more often you try, the more help you use, the more likely you will succeed.



**HELP AVAILABLE**

Most smokers make several attempts to quit before they successfully kick the habit. The more help you use to quit smoking, the more likely you will succeed.

- ⇒ **Addiction Services- 563-2050**  
Smoking cessation groups,  
Nicotine replacement therapy
- ⇒ **Smoker's Help Line**  
Phone toll free 1-877-513-5333
- ⇒ **Canadian Cancer Society**  
Phone toll free 1-888-939-3333  
Free self-help smoking cessation program called One Step at a Time, information on website: [www.cancer.ca](http://www.cancer.ca)
- ⇒ **Health Canada**  
Information and support for quitting on website, [www.gosmokefree.ca](http://www.gosmokefree.ca)
- ⇒ **Medication**  
Nicotine replacement therapy is available to help replace nicotine from cigarettes i.e. Nicotine Patch or gum. Bupropion or Zyban works to reduce cravings from nicotine withdrawal.

Printed April 26th, 2005

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**We Care  
About  
Your Health,**



**Don't Let  
it Go Up  
In Smoke!**

 Cape Breton District  
**HEALTH AUTHORITY**  
Making Healthier Choices Together



Cape Breton  
District Health  
Authority

Nicotine Replacement Therapy (NRT)

Physician Order Sheet

Orders will be activated when the order sheets are signed and dated by the physician.  
To complete the order form, check the appropriate boxes and/or fill in the required blanks.  
To delete an unwanted order the physician is to **CROSS OUT AND INITIAL THE DISCONTINUED ORDER.**

Allergies:

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1. Administer Fagerstrom Nicotine Tolerance Scale (see reverse) to obtain numeral score for patient (Mandatory for patients on Mental Health Service) Score: \_\_\_\_\_

or

Determine number cigarettes smoked per day: \_\_\_\_\_

2. MEDICATION

a. Score 6-10 or >20 cigarettes per day

- Nicotine Patch 21mg daily and nicotine gum 2mg prn (maximum 20 pieces/day; maximum 1 piece/hour) 6 weeks followed by
- Nicotine Patch 14mg daily and nicotine gum 2mg prn (maximum 20 pieces/day; maximum 1 piece/hour) 2 weeks followed by
- Nicotine Patch 7mg daily and nicotine gum 2mg prn (maximum 20 pieces/day; maximum 1 piece/hour) for a MAXIMUM of 4 additional weeks.

b. Score 1-5 or ≤ 20 cigarettes per day

- Nicotine Patch 14mg daily and nicotine gum 2mg prn (maximum 20 pieces/day; maximum 1 piece/hour) 6 weeks followed by
- Nicotine Patch 7mg daily and nicotine gum 2mg prn (maximum 20 pieces/day; maximum 1 piece/hour) 4 weeks.

3. Patients on Medication as outlined in 2b who continue to complain of withdrawal on Nicotine Patch 14mg should be switched to Medication as outlined in 2a. The Nicotine Patch 14mg is to be removed and a 21mg patch administered at time of withdrawal complaint.

4. Patients on Nicotine Patch 21mg and 2mg nicotine gum who complain of withdrawal symptoms may have gum increased to 4mg prn (maximum 20 pieces/day; maximum 1 piece/hour)

5. Reassess patient at any time during treatment; NRT not to exceed maximum number of 12 weeks.

Approved by MAC (12/09/2005)

Physician's Signature \_\_\_\_\_ Date & Time

Time

DD/MM/YYYY

Fagerstrom Nicotine Tolerance Scale

Questions		Points				Score
		0	1	2	3	
1.	How soon after you wake up do you smoke your first cigarette?	After 1 hour	31-60 minutes	6– 30 minutes	Within 5 minutes	
2.	Do you find it difficult to refrain from smoking in places where it is forbidden, such as the library, theatre or doctor's office?	No	Yes	-	-	
3.	Which would you hate most to give up?	All others	The first one in the morning	-	-	
4.	How many cigarettes do you smoke a day?	10 or less	11 – 20	21 – 30	31 or more	
5.	Do you smoke more frequently during the first hours after waking than the rest of the day?	No	Yes	-	-	
6.	Do you smoke when you are so ill that you are in bed most of the day?	No	Yes	-	-	