Appendix 2 (as supplied by the authors)

A review of quality indicators for acute myocardial infarction care

Background reference material for the Canadian Cardiovascular Outcomes Research Team / Canadian Cardiovascular Society Acute Myocardial Infarction Quality Indicator Panel
September 2007

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Introduction

Many jurisdictions are involved in efforts to measure and improve the quality of healthcare services. The concept of quality in patient care emerged in the early 1970's. Donabedian conceptualized the assessment of quality through examining the structures, processes and outcomes of care.(1) In the 1990's, the Institute of Medicine defined quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."(2) Thus, measuring the quality of care is an important step in the process of enhancing and improving care.

The interplay of structure and processes impacts patient outcomes. While little information is available regarding structure, significant attention has focused on process and outcome measures. A current area of study is the relative importance of process versus outcome measures. Processes of care are more susceptible to variations in quality than outcome measures and can detect performance lapses more easily.(3) However, process measures may not be thorough enough to replace outcome measures.(4) Process measures examine a group of patients considered ideal,(4) while outcome measures are relevant to all patients. A recent study observed that variation in performance in processes of care was not strongly associated with outcomes.(5) In addition, patients may be more concerned about outcomes. Thus, a combination of process measures and outcome measures provides a more thorough view of hospital performance.

In 2001, the Canadian Cardiovascular Outcomes Research Team (CCORT) was initiated as a Canadian Institutes of Health Research (CIHR) Interdisciplinary Health Research Team.

The CCORT team consists of approximately 30 researchers from Nova Scotia, Quebec, Ontario, Alberta and British Columbia who are working on a series of projects to measure and improve the quality of cardiac care across Canada. In 2003, the CCORT team in association with the Canadian Cardiovascular Society (CCS) published a set of quality indicators for acute myocardial infarction relevant to the Canadian health system.(6) The indicators were generated from a thorough literature review and the consensus opinion of a multidisciplinary expert panel conducted in 2001. In the four years since the publication of the CCORT/CCS AMI quality indicators, many new papers have been published on this topic including revised ACC/AHA guidelines. A number of these studies have looked at the correlation of measures and outcomes. Given advances in both the literature and clinical practice, it is time to update the Canadian quality indicators.

This manuscript provides a brief summary of the current literature on quality indicators in acute myocardial infarction and includes comparison tables describing AMI quality indicators and benchmarks used in different jurisdictions.

Methods

A literature search was conducted using OVID technology to search MEDLINE (1966 onwards) and Pubmed (1966 onwards). The specific search words used to identify articles on quality indicators and benchmarks for AMI care included the following: performance indicators, quality indicators, performance measures, quality measures, report card, registry, acute myocardial infarction, acute coronary syndromes, cardiology, care, benchmarks and standards. Only articles in English were selected. In addition, bibliographies and the Internet were explored to identify articles in the grey literature and websites of specific organizations involved in developing indicators.

Results

Organizations involved in Quality of Care

The following is a brief summary of organizations involved in developing quality indicators:

1. American College of Cardiology/ American Heart Association (ACC/AHA)

The **ACC/AHA** is a leader in creating and updating clinical practice guidelines. In the year 2000, a task force was formed to evaluate performance measures. In 2006, a report identifying eleven performance measures was published,(7) including four new measures: alternate use of ARBs for ACE-I, in the event of contra-indications (this is also recommended by the 2004 ACC/AHA STEMI guidelines); median time to fibrinolytic

therapy (this differs from other measures based on the mean time); the standard for the time-to-Primary PCI measure was reduced from 120 minutes to 90 minutes in line with the ACC/AHA STEMI guidelines 2004; and a new reperfusion therapy measure to track the percentage of eligible patients who receive reperfusion therapy. The latter measure will support assessment of appropriateness and underutilization of reperfusion therapy.(7)

2. Department of Health, UK

The **National Service Framework** (**NSF**)(8) was published by the Department of Health, UK in March 2000. This ten-year plan is aimed at implementing national standards for cardiac care to bring consistency in access and quality of care. The Myocardial Infarction National Audit Project (MINAP)(9) was published in 2003 to assess the level of performance of hospitals in accordance with NSF 2000. It evaluated hospitals performance on the call-to-needle time, door-to-needle time and use of aspirin, beta-blockers and statins at discharge.

3. Organization for Economic Co-operation and Development (OECD)

In 2004, the OECD published a report entitled "Selecting indicators for the quality of cardiac care at the Health Systems Level in OECD countries."(10) This report identified a list of indicators for measuring quality in cardiac care and highlighted the need for improving the quality of health care as a means of curbing expenditures and supporting efficient use of limited resources. Further it reported that quality could only be measured if benchmarks of performance were identified. The OECD Health Care Quality Indicators Project (HCQI) involved some 21 countries, as well as the WHO, the European Commission, the World Bank, the International Society for Quality in Health Care and the European Society for Quality in Healthcare.

4. Health Care Financing Administration (HCFA) / Centers for Medicaid and Medicare Services (CMS)

The HCFA/CMS overlooks the quality of care provided to Medicare patients. In June 2007, CMS initiated public reporting of 30 day all-cause mortality rates for AMI for hospitals.

5. Joint Commission on Accreditation of Healthcare Organizations (JCAHO)

In 2002, **JCAHO**, a not-for-profit organization, operationalized a set of standardized measures of performance in more than 3,000 hospitals in the US. JCAHO is the leading accreditor of hospitals in the US and through the ORYX initiative uses performance measures as part of its accreditation process. In 2004, CMS and JCAHO began working jointly on a set of common measures—Hospital Quality Measures (HQM)—which have also been supported by the National Quality Forum. In addition, the HQM measure set is used by the Hospital Quality Alliance.

6. Hospital Quality Alliance (HQA)

In 2002, the **HQA** was created by the Federation of American Hospitals, the American Hospital Association and the Association of American Medical Colleges and is supported by the Agency for Healthcare Research Quality (AHRQ), National Quality Forum, CMS and JCHAO. It is a public-private collaboration working to enhance voluntary hospital reporting of data related to quality of care. Benchmarks of performance derived from HQA data help in directing quality improvement in hospitals.(11)

7. Veterans Affairs (VA) Quality Enhancement Research Initiative (QUERI)

The Health Services Research and Development Service of VA launched the QUERI in 1998. The objective of QUERI is to implement evidence-based medicine and evaluate the quality of care along the lines of Donabedian's three elements of assessment: structure, process and outcome and compare the quality of cardiac care in VHA and in other non-VHA organizations. In addition, the ischemic heart disease (IHD) QUERI is involved in developing risk-adjusted models for in-hospital and 30-day mortality rates of patients with AMI.

8. Other organizations

Other organizations involved in quality improvement initiatives include the **National Committee for Quality Assurance (NCQA)** which publishes data regarding quality of care provided by health plans every year, in the Health Plan Employer Data and Information Set **(HEDIS)**. The **National Quality Forum (NQF)** is a private, not-for-profit organization addressing measurement of quality in healthcare nationally. In 2003, the **Agency for Healthcare Research and Quality (AHRQ)** released the National Healthcare Quality Report. AHRQ has its own set of quality indicators which have been used by the OECD in the Health Care Quality Indicators Project. **RAND Corporation** is another organization that generates quality indicators based on literature reviews and expert panel consensus. The **Institute of Medicine** has identified ischemic heart disease as a priority area for national action.(12) The **Leapfrog Group** is another organization which recently initiated a program to reward hospitals for performing well in five clinical areas, one of them being AMI. The **Institute for Healthcare Improvement (IHI)** ran the 100,000 Lives campaign from 2004 to 2006 to prevent deaths nationally including those caused by AMI. The program planned to reduce AMI mortality by incorporating seven components of care: early administration of aspirin, aspirin at discharge, Beta-blocker at discharge, ACE-I/ARBs at discharge for patients with systolic dysfunction, timely reperfusion (fibrinolysis or PCI) and smoking cessation counseling.

Summary of registries and studies using quality indicators

The National Registry of Myocardial Infarction **(NRMI)** is an observational study initiated in 1990 that extracts data and allows organizations to benchmark their performance. The

NRMI has been successful in collecting data for over 2.3 million AMI patients and has observed a trend of increased guideline compliance and decreased mortality.(13) The **CRUSADE** (Can Rapid risk stratification of Unstable angina Suppress ADverse outcomes with Early implementation of the ACC/AHA guidelines)(14) registry was launched in 2001 as a quality improvement initiative. It implemented ACC/AHA guidelines through protocols and educational programs to enhance management of NSTEMI patients.(15) Analyzing data from this registry identified correlations between mortality and the early use of GP IIb/IIIa inhibitors as well as low molecular weight heparin (LMWH).(16)

In 2007, the NRMI and CRUSADE registries merged with the **ACC's National Cardiovascular Data Registry (ACC-NCDR)** to form the new **ACTION** Registry which aims to measure quality indicators across hospitals and increase the adoption of ACC/AHA Guidelines by providing feedback. It will also allow hospitals to assess their performance as compared to national benchmarks. The D2B (door-to-balloon) Alliance is an initiative by ACC-NCDR to encourage hospitals and physicians to work together to reduce the door-to-balloon time.

In 2000, Guidelines Applied in Practice **(GAP)** was initiated by the ACC, to improve the quality of care for acute myocardial infarction. The objective of this project was to decrease the gap between guidelines and practice. Processes of care based on guidelines such as aspirin, beta-blockers, ACE-I prescription on discharge, treatment of elevated cholesterol, smoking cessation and dietary counseling(17) were encouraged by the use of tool kits. The use of the "tool kits" comprised of standard order sets, pathways, pocket guides etc., was observed to increase adherence to guideline-recommended medications.(18)

Get with the Guidelines (**GWTG**), was launched by the AHA in 2000, to improve the quality of AMI care in hospitals. The initiative uses web-based tools to enhance adherence to the ACC/AHA guidelines, is aimed at secondary prevention and has observed improvements in the rates of smoking cessation, aspirin use, statin use, LDL cholesterol measurement, blood pressure control and rehabilitation.(19)

EFFECT (Enhanced Feedback for Effective Cardiac Treatment) is a three-phase study, which is being carried out by CCORT to observe the effects of report cards on improvement in the quality of care for AMI patients. Phase I of the study was successfully completed while Phase II is currently underway. As part of Phase I, 104 hospitals were randomized to receive either early or delayed feedback(20) regarding their performance. Data from 1999-2001 was collected on more than 11,000 patients and quality was assessed utilizing indicators generated by CCORT/CCS.

Quality indicators used by these studies are provided in Table 1 (Comparison of indicators in different jurisdictions) at the end of this document.

Discussion

To date, the CCORT/CCS AMI quality indicators are the most comprehensive as they encompass processes of care as well as outcome measures. However, with the publication of newer guidelines, research studies and changes in practice, the CCORT/CCS indicators need to be updated to ensure they remain current and relevant. Potential new indicators, currently used in various jurisdictions, are noted below, while Table 1 provides a detailed comparison.

There is an increasing need to develop indicators to assess the pre-hospital stage of patient care. Currently, few organizations have addressed this component of the care timeline. The NSF has taken a step towards incorporating two indicators that evaluate patient care provided by ambulance services. One of the indicators assesses the proportion of calls attended within 8 minutes by trained individuals with defibrillators. The other measure assesses the call-to-door time within 30 minutes or the call-to-needle time within 60 minutes.(8)

Evaluating door-to-ECG time may prove to be another important indicator as it may affect other processes of care such as initiation of fibrinolytic therapy. The ACC/AHA guidelines recommend that an ECG should be done within 10 minutes of patient arrival at the hospital.(21) This measure is already in use in a number of studies such as EFFECT, the Brisbane Cardiac Consortium(22) and Glickman et al.(23) The ECG may be important in determining the care received by patients, as noted in a recent study, where 1 in 8 patients with high risk findings on ECG were not identified in the ER and this was strongly associated with lack of provision of evidence-based care.(24)

The door-to-needle time for fibrinolytics has been reduced from 60 minutes to 30 minutes as recommended by the ACC/AHA STEMI guidelines 2004.(21) In addition, this measure is part of the performance measures recommended by the ACC/AHA Task force,(7) has been adopted by JCAHO, CMS and the HQA and is in use in studies in both the US and Australia.(22) The NSF, however, updated its standard and reduced the door-to-needle time (D2N) time from 30 minutes to 20 minutes in 2003—currently the shortest time period identified for D2N time. Similarly, under the recommendations from the 2004 guidelines, the time-to-PCI has been reduced from 120 minutes to 90 minutes.(21) The new target has been incorporated by the task force, CMS, JCAHO, HQA and various studies.

Smoking cessation counseling is a Class IB recommendation in the STEMI(21) and NSTEMI(25) guidelines. This measure is an integral part of the ACC/AHA performance measures, CMS, JCAHO, HQA and many studies as seen in Table 1 of this document. Likewise, cardiac rehabilitation programs are a Class IC recommendation in the 2004 STEMI guidelines.(21) The latter two indicators are used extensively by different jurisdictions.

There has been less focus on NSTEMI patients as compared to STEMI patients. Recent studies have provided new evidence for the use of clopidogrel in NSTEMI patients. According to the ACC/AHA guidelines, clopidogrel should be given (in addition to aspirin) to NSTEMI patients with no planned intervention and also to patients with planned PCI unless a high risk of bleeding has been identified. It is further advised that the therapy should be continued for 1 month (Class IA) or for 9 months (Class IB). Similarly, recommendations are made for the use of GP IIb/IIIa inhibitors especially before PCI. Initiation of heparin is a Class IA recommendation in addition to ASA and/or clopidogrel. In patients with NSTE-ACS, after excluding patients with contraindications, the use of LMWH and GP IIb/IIIa inhibitors have been associated with improved patient survival.(26,27)

After classifying indicators, it is also important to set associated target rates or benchmarks. These benchmarks serve as a minimum standard that should be achieved by hospitals providing AMI care. CCORT/CCS, NSF and the MISSION group have clearly identified benchmarks for indicators. As with indicators, benchmarks need to be periodically reviewed to ensure they reflect current practice. In addition, target rates should be high enough to ensure good quality care, and yet also be achievable.

Current use of indicators

Once clinical practice guidelines have been defined, the cycle of quality improvement needs to be completed through the measurement of performance. Assessment of performance through the use of process and outcome measures generates feedback and improvement in clinical knowledge which in combination with expert consensus leads to updates of clinical practice guidelines.

A few studies are described below that have used indicators for assessing hospital performance and in deriving associations between evidence-based therapies and improved outcomes.

Guideline compliance has been correlated with survival at one year after AMI(28) and thus many projects have focused on enhancing the implementation of guidelines such as Guidelines Applied in Practice, Get with the Guidelines and CRUSADE.(16,29,30) Observational studies such as the Cooperative Cardiovascular Project (CCP) and the National Registry of Myocardial Infarction (NRMI) have associated increased use of guideline-suggested therapies with better outcomes.(31,32) Public reporting of data related to quality and pay for performance has been identified by various studies as a means to enhance quality.(33–37) In a recent study published in February 2007, Lindenaeur and colleagues observed that hospitals receiving a 1%–2% bonus for high levels of performance had greater improvements in mortality as compared to hospitals receiving no monetary incentives.(38) Likewise, studies have highlighted the positive contribution of feedback in enhancing hospitals' performance on quality measures.(31,39,40) This applies to feedback provided to both clinicians and physicians (41-43). However, a recent study, utilizing confidential report card based feedback was not associated with improvements in

patient care.(44) Therefore, a multi-dimensional intervention, encompassing feedback, guideline-based tools and use of opinion leaders may have more impact than one based on a single method or dimension.

The MINAP 2003 was carried out in the UK to determine the performance of hospitals. It was observed that 95 hospitals accomplished the door-to-needle time 30 minutes (DTN30) target, an increase from 52 since the last report in November 2002.(9) It was noted that overall care provided in hospitals had improved at an increased rate against a background of NSF and a national online electronic reporting and analysis system.(45)

A recent study by Liem et al,(46) used tools at three points in the care cycle: pre-hospital, in-hospital and outpatient, in order to increase compliance with guidelines. After the implementation stage, the study group used indicators to assess performance against benchmarks using data from the Euro Heart survey and the EuroAspire registry(47–49) and observed improved outcomes.

The future holds promise for real-time registries which would allow omissions to be corrected and quality of care guaranteed by a rapid cycle feedback. A study by Vasaiwala et al(50) applied real-time observation of patients to capitalize on the GAP model of care at a local hospital which helped to decrease both in-hospital and six month mortality.

Chen et al examined the association of JCAHO accreditation and hospitals' quality of care in Medicare patients. An increased use of therapies in AMI and a better 30-day outcome was observed in hospitals that were surveyed by JCAHO. But within surveyed hospitals large differences in the use of treatments were observed.(51) It was observed that hospital performance measures developed by CMS predict small differences in mortality rates in different hospitals.(52) This point was echoed, when Bradley and colleagues observed that only 6% of the differences in 30-day AMI mortality rates in hospitals were attributed to the performance of hospitals on the CMS/JCAHO measures.(5) In contrast, Peterson and colleagues found a strong relationship between hospital performance and outcomes. After risk-adjustment, a 10% increase in composite adherence was associated with a 10% decrease in mortality.(53) Likewise, better performance on AMI HQA indicators was associated with increased survival.(11) These varied results highlight the increasing need for a comprehensive list of indicators that are more thorough in assessing hospital performance.

Conclusion

While formulating the performance indicators it is important to have a balanced mix of both measures of process as well as measures of outcome. Outcome measures provide a more holistic view of the care delivered and may hold more importance for the patient.(54) In the future structural indicators such as protocols and use of physician tools would form an important part of quality indicators for AMI care in hospitals.

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Table 1: Comparison of performance indicators in use in different countries.

#	Indicators	CCORT[1]	NSF[2]	OECD[3]	HQA[4]^	ACC/AHA[5]	JCAHO[6]	HEDIS[7]	PP[8]	P[9]	GAP[10]	Mehta[11]	CCP[12]	Chen[13]	Normand[14]	QUICC[15]	Beck[16]	MISSION[17]	BCC[18]	Scott[19]	West[20]
	(Organizations)								*(Studies/Registries)*												
	Countries	Ca	UK	Int.	US	US	US	US	US	US	US	US	US	US	US	SE	Ca	NL	Au	Au	Au
	Year	2001	2000	2004	2007	2006	2001	2007	2007	2006	2004	2000	1999	1999	1996	2006	2005	2007	2004	2005	2000
	Pre-Hospital Indicators																				
1.	Calls to emergency services attended within 8 minutes by a trained individual with a defibrillator		✔																		
2.	Patients eligible for thrombolysis arriving at hospital within 30 minutes of call for professional help (call to door time)		✔																		
	In-hospital Indicators																				
3.	ECG within 10 minutes of hospital arrival								✔										✔		
4.	ECG interpretation time on admission																				
5.	**Aspirin prescribed within 6 hours** or 24 hours **of hospital arrival**	✔		✔	✔	✔	✔		✔ c	✔	✔	✔ e	✔		✔ e				✔		
6.	**Beta-blockers within 12 hours of admission** or arrival	✔			✔	✔	✔	✔	✔ c	✔ w	✔								✔		
7.	**Reperfusion with thrombolytics during hospitalization**	✔																	✔	✔	✔
8.	**Median 'door to needle' time for thrombolysis**	✔		✔			✔														
9.	Thrombolytics received within 30 min of hospital arrival				✔	✔													✔	✔	
10.	Thrombolytics received within 60 min of hospital arrival																		✔		
11.	Number and proportion of patients eligible for thrombolysis receiving it within 20 minutes of arrival at hospital (door to needle time)		✔																		
12.	Number and proportion of patients eligible for thrombolysis receiving it within 60 minutes of call for professional help (call to needle time)		✔																		
13.	GP IIb/IIIa inhibitor use during hospital stay								✔	✔ w									✔		
14.	Cardiac catheterization within 48 hours of arrival								✔												
15.	Coronary angiography performed during hospital stay															✔					
16.	**Coronary angiography in-hospital or referral for angiography (test indicator*)**	✔																	✔	✔ d	
17.	Heparin or LMWH use during hospitalization								✔	✔ w						✔			✔		
18.	Clopidogrel use during hospital stay																	✔ w			
19.	Non-invasive risk stratification																		✔	✔ d	
20.	Glycoprotein IIb/IIIa inhibitor before PCI																		✔		
21.	**Reperfusion using PCI**	✔																			
22.	**Median time from door to first balloon inflation in primary PCI**	✔		✔			✔														
23.	PCI received within 120 min of hospital arrival																				
24.	PCI received within 90 min of hospital arrival				✔ ~	✔													✔		
25.	Reperfusion therapy					✔						✔	✔	✔	✔						
26.	STEMI patients meeting criteria for reperfusion and receiving it																				
27.	**Lipid sample obtained within 24 hours of admission** or in hospital	✔				✔					✔								✔		
28.	Statins within 24 hours																		✔		

#	Indicator	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20
29.	**Aspirin prescribed at hospital discharge**	✔	✔	✔	✔	✔	✔		✔ c	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
30.	**Beta-blockers at hospital discharge**	✔	✔	✔	✔	✔	✔		✔ c	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
31.	ACE inhibitors/ARB for LVSD				✔		✔		✔ c									✔ w			
32.	**ACE inhibitors prescribed at hospital discharge**	✔	✔	✔		✔				✔	✔	✔	✔		✔	✔		✔	✔	✔	✔
33.	**Statins**/lipid-lowering **prescribed at hospital discharge**	✔	✔	✔		✔			✔	✔	✔	✔			✔	✔		✔	✔	✔	✔
34.	Calcium channel blockers held at discharge											✔	✔	✔							
35.	Clopidogrel prescribed at discharge								✔	✔						✔		✔			
36.	Smoking cessation counseling				✔	✔	✔		✔ c		✔	✔	✔								
37.	Blood pressure < 140/90 at discharge																	✔			
38.	In-hospital cardiac counseling																		✔	✔	
39.	Dietary modification counseling								✔		✔										
40.	Referral for cardiac rehabilitation								✔										✔	✔	✔
41.	**Median length of stay in emergency department**	✔																			
42.	**Median length of coronary care unit/intensive care unit stay**	✔																			
43.	**Median/**mean **length of in-hospital stay**	✔																✔	✔	✔	✔
	Outpatient Indicators																				
44.	Aspirin use at 30 days																	✔	✔		
45.	Aspirin use at 90 days of post discharge																			✔	
46.	Aspirin six month adherence post discharge																	✔	✔		
47.	Aspirin one year adherence post discharge																	✔	✔		
48.	Beta-blocker prescription filled within 7 days																				
49.	**Beta-blocker prescription filled within 30 days post discharge**	✔																✔	✔		
50.	**Beta-blocker prescription filled within 90 days post discharge**	✔																		✔	
51.	Beta-blocker six month adherence post discharge																	✔	✔		
52.	**Beta-blocker one year adherence post discharge**	✔																✔	✔		
53.	Use of beta-blocker use after MI						✔														
54.	Clopidogrel use at 30 days																		✔		
55.	Clopidogrel use at 6 months																		✔		
56.	Clopidogrel use at one year																		✔		
57.	**ACE inhibitor prescription filled within 30 days post discharge**	✔																✔	✔		
58.	**ACE inhibitor prescription filled within 90 days post discharge**	✔																		✔	
59.	ACE inhibitor six month adherence post discharge																	✔	✔		
60.	**ACE inhibitor one year adherence post discharge**	✔																✔	✔		
61.	**Statin prescription filled within 30 days post discharge**	✔																✔	✔		
62.	**Statin prescription filled within 90 days post discharge**	✔																		✔	
63.	Statin six month adherence post discharge																	✔	✔		
64.	**Statin one year adherence post discharge**	✔																✔	✔		
65.	**Physician visit within four weeks of post discharge**	✔																✔			
66.	**Median waiting time (in days) for catheterization postmyocardial infarction**	✔																✔			
67.	**Median waiting time (in days) for PCI postmyocardial infarction**	✔																✔			
68.	**Median waiting time (in days) for coronary artery bypass graft postmyocardial infarction**	✔																✔	✔		

	Outcome Indicators											
69.	**In-hospital mortality**	✔	✔		✔	✔	✔		✔	✔	✔	✔
70.	**30 day mortality**	✔	✔	✔				✔	✔			
71.	**One year mortality**	✔	✔									
72.	**AMI readmission rate at 30 days post discharge**	✔							✔	✔		
73.	Same cause readmission in 30 days										✔	
74.	**AMI readmission rate of one year post discharge**	✔										
75.	Reinfarction rate											✔
76.	**CHF readmission rate at 30 days post discharge**	✔							✔			
77.	**CHF readmission rate at one year post discharge**	✔										
78.	**Unstable angina readmission rate at 30 days post discharge**	✔							✔			
79.	**Unstable angina readmission rate at one year post discharge**	✔										

The quality indicators in bold are part of the CCORT/CCS indicators developed in 2001.

Jurisdictions:
CCORT[1]
NSF: National Service Framework[2]
OECD: Organization for Economic Co-operation and Development[3]
HQA: Hospital Quality Alliance[4]
ACC/AHA: American College of Cardiology/American Heart Association[5]
JCAHO: Joint Commission on Accreditation of Healthcare Organizations[6]
HEDIS: Healthcare Effectiveness Data and Information Set[7]
PP: Pay for performance, quality of care and outcomes in AMI[8]

P: Peterson et al.[9]
GAP: Guidelines Applied in Practice[10]
Mehta et al [11]
CCP: Cooperative Cardiovascular Project[12]
Chen et al [13]
Normand et al[14]
QUICC: Quality Improvement in Coronary Care[15]

MISSION: Optimization of acute and chronic care for patients with AMI[10]
BCC: Brisbane Cardiac Consortium[11]
Beck et al [12]
Scott et al [13]
West: WESTCOP[20]

Int: International
NL: Netherlands
Au: Australia
SE: Sweden
ECG: electrocardiogram
ACE: angiotensin-converting enzyme
ARB: Angiotensin receptor blocker
LVSD: Left ventricular systolic dysfunction
c: Centers for Medicaid and Medicare Services (CMS) measures
~: Since 2006, the time has been decreased from 120 to 90 minutes
w: within 24 hours
e: in the ED
d: within 30 days

<u>References for Table 1 (Comparison of indicators in different jurisdictions)</u>

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