



# Getting Started Kit: Improved Care for Acute Myocardial Infarction

## Bibliography

### **100,000 Lives Campaign**

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

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**Bibliography: Improved Care for Acute Myocardial Infarction**

Adams K, Corrigan JM, eds. *Priority Areas for National Action: Transforming Health Care Quality*. Washington, DC: The National Academies Press, 2003.

This publication is part of the Institute of Medicine (IOM) *Quality Chasm* Series. It presents recommendations of the IOM's Committee on Identifying Priority Areas for Quality Improvement and is a follow-up to the 2001 IOM report, *Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century*. "Ischemic heart disease – prevention, reduction of recurring events, and optimization of functional capacity" is one of 20 "priority areas for improvement in health care quality" identified in this report.

Antman EM, Anbe DT, Armstrong PW, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction – executive summary. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 1999 Guidelines for the Management of Patients with Acute Myocardial Infarction). *J Am Coll Cardiol*. 2004;44:671-719.

This is an update of an evidence-based guideline for the management of patients with acute myocardial infarction (AMI), originally issued by the ACC and AHA in 1999.

Antman EM, Lau J, Kupelnick B, Mosteller F, Chalmers TC. A comparison of results of meta-analyses of randomized controlled trials and recommendations of clinical experts: treatments for myocardial infarction. *JAMA*. 1992;268:240-248.

The authors examine the temporal relationship between accumulating data from randomized control trials of treatments for AMI and the recommendations of clinical experts writing review articles and textbook chapters. Based on the results of a cumulative meta-analysis, they conclude that there are often discrepancies between the most current evidence of effective practice as derived from randomized trials and the recommendations of reviewers. Review articles often fail to mention important advances or exhibit delays in recommending effective preventive measures. In some cases, treatments that have no effect on mortality or are potentially harmful continue to be recommended. The authors conclude that finding and analyzing all therapeutic trials in a given field has become such a difficult and specialized task that clinical experts called on to summarize the evidence in a timely fashion need access to better databases and new statistical techniques to assist them in this important task.

Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients: Antithrombotic Trialists' Collaboration. *BMJ*. 2002;324:71-86.

The authors used collaborative meta-analyses (systematic overviews) to determine the effects of antiplatelet therapy among patients at high risk of occlusive vascular events. They included in these meta-analyses randomized trials of an antiplatelet regimen versus control or of one antiplatelet regimen versus another in high risk patients (with acute or previous vascular disease or some other predisposing condition) from which results were available before September 1997. The main outcome measure was "serious vascular event," defined as non-fatal myocardial infarction, non-fatal stroke, or vascular death.

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Two hundred and eighty-seven studies involving 135,000 patients in comparisons of antiplatelet therapy versus control and 77,000 in comparisons of different antiplatelet regimens met inclusion criteria. Overall, among these high-risk patients, allocation to antiplatelet therapy reduced the combined outcome of any serious vascular event by about one quarter; non-fatal myocardial infarction was reduced by one third, non-fatal stroke by one quarter, and vascular mortality by one sixth (with no apparent adverse effect on other deaths). Absolute reductions in the risk of having a serious vascular event were 36 (SE 5) per 1000 treated for two years among patients with previous myocardial infarction; 38 (5) per 1000 patients treated for one month among patients with acute myocardial infarction; 36 (6) per 1000 treated for two years among those with previous stroke or transient ischaemic attack; 9 (3) per 1000 treated for three weeks among those with acute stroke; and 22 (3) per 1000 treated for two years among other high risk patients (with separately significant results for those with stable angina ( $P=0.0005$ ), peripheral arterial disease ( $P=0.004$ ), and atrial fibrillation ( $P=0.01$ )). In each of these high risk categories, the absolute benefits substantially outweighed the absolute risks of major extracranial bleeding. Aspirin was the most widely studied antiplatelet drug, with doses of 75-150 mg daily at least as effective as higher daily doses. The effects of doses lower than 75 mg daily were less certain. Clopidogrel reduced serious vascular events by 10% (4%) compared with aspirin, which was similar to the 12% (7%) reduction observed with its analogue ticlopidine. Addition of dipyridamole to aspirin produced no significant further reduction in vascular events compared with aspirin alone. Among patients at high risk of immediate coronary occlusion, short-term addition of an intravenous glycoprotein IIb/IIIa antagonist to aspirin prevented a further 20 (4) vascular events per 1000 ( $P<0.0001$ ) but caused 23 major (but rarely fatal) extracranial bleeds per 1000.

The authors concluded that aspirin (or another oral antiplatelet drug) is protective in most types of patient at increased risk of occlusive vascular events, including those with an acute myocardial infarction or ischemic stroke, unstable or stable angina, previous myocardial infarction, stroke or cerebral ischemia, peripheral arterial disease, or atrial fibrillation. Low-dose aspirin (75-150 mg daily) is an effective antiplatelet regimen for long-term use, but in acute settings an initial loading dose of at least 150 mg aspirin may be required. Adding a second antiplatelet drug to aspirin may produce additional benefits in some clinical circumstances, but more research into this strategy is needed.

Hennekens CH, Albert CM, Godfried SL, Gaziano JM, Buring JE. Adjunctive drug therapy of acute myocardial infarction – evidence from clinical trials. *N Engl J Med*. 1996;335:1660-1667.

The authors review current evidence from randomized trials and meta-analyses regarding the effectiveness of several categories of drugs in the treatment of patients with AMI, including beta-adrenergic antagonists, angiotensin-converting-enzyme (ACE) inhibitors, nitrates, calcium-channel blockers, antiarrhythmic drugs, and magnesium. They conclude that beta-adrenergic antagonists are effective in reducing mortality during and after AMI (relative risk 0.87 and 0.77) and that ACE inhibitors are effective in reducing mortality after AMI in patients with left ventricular dysfunction (relative risk 0.78).

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**Bibliography: Improved Care for Acute Myocardial Infarction**

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

In an effort to assess the impact of the Medicare Quality Improvement Organization (QIO) program on the quality and safety of health care in the United States, the authors tracked national- and state-level changes in performance on 22 quality indicators for care of Medicare beneficiaries using observational cross-sectional studies of national and state-level fee-for-service data for Medicare beneficiaries during 1998-1999 (baseline) and 2000-2001 (follow-up). Absolute improvement was defined as the change in performance from baseline to follow-up (measured in percentage points for all indicators except those measured in minutes); relative improvement was defined as the absolute improvement divided by the difference between the baseline performance and perfect performance (100%). The median state's performance improved from baseline to follow-up on 20 of the 22 indicators. In the median state, the percentage of patients receiving appropriate care on the median indicator increased from 69.5% to 73.4%, a 12.8% relative improvement. The average relative improvement was 19.9% for outpatient indicators combined and 11.9% for inpatient indicators combined ( $P < .001$ ). For all but one indicator, absolute improvement was greater in states in which performance was low at baseline than those in which it was high at baseline (median  $r = -0.43$ ; range: 0.12 to -0.93). When states were ranked on each indicator, the state's average rank was highly stable over time ( $r = 0.93$  for 1998-1999 vs. 2000-2001). The authors conclude that care for Medicare fee-for-service plan beneficiaries improved substantially between 1998-1999 and 2000-2001, but a much larger opportunity remains for further improvement.

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.

The authors describe a nonrandomized before-after study comparing patients hospitalized before (1996-1998) and after (1999-2002) implementation of a discharge medication program (DMP) by the 10 largest hospitals in the Utah-based Intermountain Health Care system. The goal of the program was to ensure appropriate prescription of aspirin, statins, beta-blockers, ACE inhibitors, and warfarin at hospital discharge. Patients were followed for up to 1 year. Authors found that the rate of prescription of each medication increased significantly to more than 90% ( $P < 0.001$ ); this rate was sustained. At 1 year, unadjusted absolute event rates for readmission and death, respectively, were 210 per 1000 person-years and 96 per 1000 person-years before DMP implementation and 191 per 1000 person-years and 70 per 1000 person-years afterward. Relative risk for death and readmission at 30 days decreased after DMP implementation; hazard ratios (HRs) for death and readmission were 0.81 (95% CI, 0.73 to 0.89) and 0.92 (CI, 0.87 to 0.99) ( $P < 0.001$  and  $P = 0.017$ , respectively). At 1 year, risk for death continued to decrease (hazard ratio, 0.79 [CI, 0.75 to 0.84];  $P < 0.001$ ) while risk for readmission stabilized (hazard ratio, 0.94 [CI, 0.90 to 0.98];  $P = 0.002$ ), probably because survivors had more opportunities to be readmitted.

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### **Bibliography: Improved Care for Acute Myocardial Infarction**

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

The authors telephoned a random sample of adults living in 12 metropolitan areas in the U.S. and asked them about selected health care experiences. They also reviewed medical records for the most recent two-year period to evaluate performance on 439 indicators of quality of preventive care as well as care for 30 acute and chronic conditions, including AMI. Overall, survey participants received 54.9 percent of recommended services. However, only 61 percent of persons presenting with AMI received aspirin and only 45 percent received beta-blockers.

## **Resources**

American College of Cardiology Clinical Guidelines

[www.acc.org/clinical/guidelines/stemi/index\\_pkt.pdf](http://www.acc.org/clinical/guidelines/stemi/index_pkt.pdf)

CMS National Acute Myocardial Infarction Project

[www.medqic.org/content/nationalpriorities/topics](http://www.medqic.org/content/nationalpriorities/topics)

JCAHO Core Measures: Change Announcement

<http://www.jcaho.org/pms/core+measures/changeinaceiforlvsdmeasuresincorparbs.pdf>