

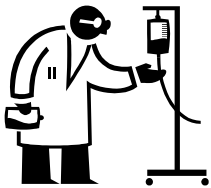
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Delivery of thrombolysis in England: Audit against NSF standards



Additional investment in human resources and IT is required if the standards for delivery of thrombolysis

embodied in the NSF are to be recorded and achieved, according to the results of this analysis.¹

The NSF for coronary heart disease stresses that delay in the delivery of thrombolysis for acute myocardial infarction should be a maximum of 60 minutes for 'call to needle time' (from initial call to treatment) and 20 minutes for 'door to needle time' (arrival at hospital). A postal questionnaire was sent to 201 acute hospitals in England to find out how closely these times were being adhered to. 125 (62%) hospitals responded.

Of the respondent hospitals, 102 (82%) had introduced strategies to reduce delays in thrombolysis. 108 (86%) and 49 (39%) hospitals had audit standards in place for the delivery of thrombolysis for 'door to needle time' and 'call to needle time', respectively. 29 (36%) had a stated standard of 'call to needle time' of less than 60 mins. The audit revealed

significant deficiencies in data collection. Only 13 (10%) collected the mean and 4 (3%) the median 'call to needle time'.

The authors conclude that there are shortfalls in the delivery of thrombolysis, even in hospitals that had introduced measures to reduce delays.

Keywords: national service framework, guidelines, myocardial infarction, thrombolysis

1. Rhodes M et al. National service framework for coronary heart disease: audit of English hospitals. *BMJ* 2002; 324: 709

Improving quality of care for acute MI



Implementation of guideline-based tools for acute myocardial infarction (MI) may improve the use of key evidence-based treatments, according to the results of Guidelines Applied in Practice (GAP) initiative.¹

The GAP programme was developed in collaboration with the American College of Cardiology with the aim to incorporate national guidelines into care processes. Previous studies have shown disappointing adherence to the therapies recommended in published guidelines for patients with acute MI. The project consisted of customised clinical tools (e.g. including clinical pathways and patient discharge forms) based on national guidelines, recruitment of local physician and nurse opinion leaders, and site visits. 10 hospitals were selected to participate from a local consortium of 31 hospitals in the USA.

A random sample of patients admitted to the 10 GAP hospitals for confirmed MI at baseline (1998-1999) and following intervention (2000) served as the intervention group. The same process was used to sample patients for the control group from the local consortium

of hospitals. The main outcome measures were the differences in adherence to quality indicators (use of aspirin, β -blockers, and ACE-inhibitors at discharge; time to reperfusion; smoking cessation and diet counselling; and cholesterol assessment and treatment) between patients in the intervention and control groups.

Overall in both groups, increases in adherence to key treatments were seen in the administration of aspirin (81% at baseline vs. 87% at follow up; $p=0.02$) and β -blockers (65% vs. 74%; $p=0.04$) on admission and use of aspirin (84% vs. 92%; $p=0.002$) and smoking cessation counselling (53% vs. 65%; $p=0.02$) at discharge. For most of the other indicators nonsignificant but favourable trends toward improvement in adherence to treatment goals were observed. Compared with the control group, only the increase in use of aspirin at discharge was significantly greater in the intervention group at follow up, although there were favourable trends in some of the other quality indicators.

The authors acknowledge that the cost implications of this quality improvement initiative were not evaluated. They suggest future studies are needed to address the cost-effectiveness of such programmes.

An accompanying editorial² discusses the implications of the GAP initiative for clinical practice. The author points out that modest gains in healthcare delivery achieved over a span of several months, as in the GAP initiative, are of considerable importance, since more sizeable gains may occur in the years ahead.

Keywords: evidence-based medicine, guidelines, myocardial infarction

1. Mehta RH et al. Improving quality of care for acute myocardial infarction. The Guidelines Applied in Practice (GAP) initiative. *JAMA* 2002;287:1269-1276
2. Rich MW. From clinical trials to clinical practice. Bridging the GAP. *Ibid*: 1321-1322

β-blockers for prevention of perioperative cardiac events



β-blockers reduce the rate of perioperative cardiac events in patients undergoing major non-cardiac surgery, according to the results of this analysis.¹

The analysis included five randomised controlled trials that examined the impact of giving β-blockers to patients undergoing major non-cardiac surgery on one or more of the following outcomes; myocardial ischaemia, myocardial infarction (MI), cardiac mortality and all-cause mortality. Although the studies involved different β-blockers and different dosages, therapy was started in all studies before induction of anaesthesia and continued into the postoperative period.

Of the four studies that reported perioperative myocardial ischaemia, three found a statistically significant reduction in ischaemia among treated patients, with a number needed to treat (NNT) of 2.5 to 6.7. Patients in the fourth study were at low risk, with only 15% of the control group experiencing ischaemia, compared to 28-73% of controls in the three other studies. Among two of the three studies that evaluated MI or mortality, the rates of these outcomes were also significantly reduced among patients receiving β-blockers compared to controls, with a NNT of 3.2 to 8.3. The one study that found no difference had a small sample size, short length of follow up, and a relatively high proportion of patients who had been receiving β-blockers pre-operatively. It is suggested that patients who are β-blocker-naïve may have a different response to perioperative β-blockers. Apart from bradycardia, adverse events were uncommon and mild in severity.

The authors recommend that patients at intermediate or high risk of cardiac

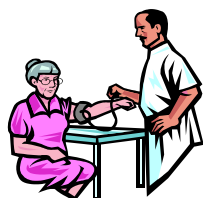
events are treated with β-blockers prior to non-cardiac surgery. The β-blocker should be started up to 30 days before surgery, and continued for up to 1 month postoperatively. However, they note that these recommendations are limited in their applicability as they are based on studies involving relatively few, carefully selected patients who received a variety of β-blockers.

In an accompanying article, three hypothetical cases are used to demonstrate how physicians can use available evidence to guide them in deciding if a patient is a good candidate for perioperative β-blocker therapy.²

Keywords: postoperative complications, beta blockers, cardiovascular disorders

1. Auerbach AD et al. β-blockers and reduction of cardiac events in non-cardiac surgery. Scientific review. *JAMA* 2002; 287: 1435-44
2. Auerbach AD et al. β-blockers and reduction of cardiac events in non-cardiac surgery. Clinical applications. *Ibid*: 1445-47

Cost effectiveness of metoprolol vs. carvedilol for heart failure



Carvedilol may be more cost effective in patients with heart failure (HF) than metoprolol, despite higher acquisition costs, according to the results of this company sponsored US study comparing resource use and costs in heart failure.¹

It has been established that use of β-blockers in patients with HF gives clinical and cost benefits. However, comparative efficacy of different β-blockers is unclear. The aim of this study was to assess the healthcare resource use and associated costs in HF patients treated with metoprolol or carvedilol in the managed care setting.

Data was collected retrospectively from health maintenance organisations in the US between June 1997 and December 1998. All patients were less than 65 years old (restriction placed by method of data collection), had a diagnosis of HF, were on a loop or thiazide diuretic and taking either carvedilol (n=139) or metoprolol (n=106). Clinical and

economic data was extracted for the 6-month period after the first beta-blocker prescription.

The average daily dose was 43 ±31mg for patients receiving carvedilol and 92±48mg for metoprolol treated patients. Patients who received carvedilol had significantly fewer total hospitalisations compared with the metoprolol group (36% vs. 62.3%, respectively, p<0.001), and fewer emergency visits (23.7% vs. 42.5%, p=0.002) (adjusted odds ratio for carvedilol and risk of any hospitalisation 0.35 [95% CI 0.20-0.63] p<0.001). Compared with metoprolol, carvedilol-treated patients had significantly higher pharmacy costs (mean \$1677 vs. \$1322; p<0.001) but significantly lower medical costs (mean \$6424 vs. \$13,153; p<0.001).

The authors are not aware of other such studies that directly compare clinical outcomes such as hospitalisation rates although other small studies have compared clinical benefits (e.g. cardiac parameters), with conflicting results. They comment that, carvedilol-treated patients had more outpatient visits (13.6 vs. 8.9, p<0.05). This may have contributed to reductions in hospitalisation by providing more opportunity for monitoring and therapy adjustment. The relatively higher dosing of carvedilol suggests that patients were more likely to achieve target doses used in clinical trials. Concomitant use of ACE inhibitors and digoxin was also higher in the carvedilol treated patients. 95% and 78% of carvedilol-treated patients also received an ACE inhibitor and/or digoxin, whilst 71% and 47% metoprolol-treated patients received such additional therapy. Other limitations include the fact that a secondary data source designed for payment was used, and, at the time of the study, relatively few patients with heart failure were treated with beta-blockers, limiting the sample size of the population.

Keywords: metoprolol, carvedilol, heart failure, pharmacoconomics

1. Luzier et al. Reimbursement claims analysis of outcomes with carvedilol and metoprolol. *Ann Pharmacother* 2002; 36: 386-91