

MI: secondary prevention

Costing report

Implementing NICE guidance

May 2007

This costing report accompanies the clinical guideline: 'Secondary prevention in primary and secondary care for patients following a myocardial infarction' (available online at www.nice.org.uk/CG048).

Issue date: May 2007

This guidance is written in the following context

This report represents the view of the Institute, which was arrived at after careful consideration of the available data and through consulting healthcare professionals. It should be read in conjunction with the NICE guideline. The report and templates are implementation tools and focus on those areas that were considered to have significant impact on resource utilisation.

The cost and activity assessments in the reports are estimates based on a number of assumptions. They provide an indication of the likely impact of the principal recommendations and are not absolute figures. Assumptions used in the report are based on assessment of the national average. Local practice may be different from this, and the template can be amended to reflect local practice to estimate local impact.

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Executive summary

This costing report looks at the resource impact of implementing the NICE guideline 'Secondary prevention in primary and secondary care for patients following a myocardial infarction' in England.

The costing method adopted is outlined in appendix A; it uses the most accurate data available, was produced in conjunction with key clinicians, and reviewed by clinical and financial professionals.

Supporting implementation

This is an update of the existing NICE guideline 'Prophylaxis for patients who have experienced a myocardial infarction' (NICE inherited guideline A, April 2001). The guideline is based on the best available evidence of clinical and cost effectiveness.

The NICE clinical guideline on MI: secondary prevention is supported by a range of implementation tools available on our website www.nice.org.uk/CG048 and detailed in the main body of this report.

Significant resource-impact recommendations

Because of the breadth and complexity of the guideline, this report focuses on recommendations that are considered to have the greatest resource impact and therefore require the most additional resources to implement or can potentially generate savings. They are:

- For patients who have had an MI within 3 months and who are not achieving 7 g of omega 3 fatty acids per week, consider providing at least 1 g daily of omega-3-acid ethyl esters treatment licensed for secondary prevention post MI for up to 4 years.
- All patients (regardless of their age) should be given advice about and offered a cardiac rehabilitation programme with an exercise component.

- Reminders such as:
 - telephone calls
 - telephone calls in combination with direct contact from a healthcare professional
 - motivational letters

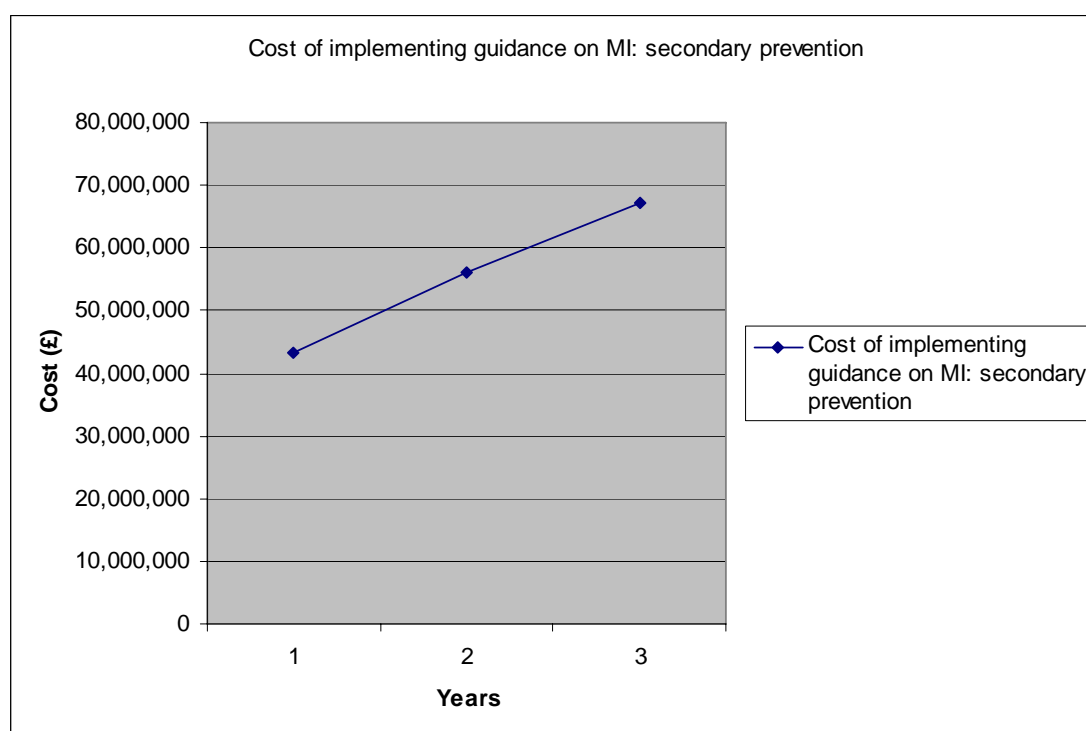
should be used to improve uptake of cardiac rehabilitation.

- For patients who have had an acute MI and who have symptoms and/or signs of heart failure and left ventricular systolic dysfunction, treatment with an aldosterone antagonist licensed for post-MI treatment should be initiated within 3–14 days of the MI, preferably after ACE inhibitor therapy.
- All patients should be offered a cardiological assessment to consider whether coronary revascularisation is appropriate. This should take into account comorbidity.

Total cost impact

The annual changes in revenue costs arising from fully implementing the guideline are summarised in the table below. It is estimated that the guideline will take more than 10 years to fully implement because changes to medication prescribed are applicable only to new patients presenting with a recent MI, and not for the backlog of patients who have had an MI in the past. We have focused on the costs over the next three years, which is the typical financial planning horizon within the NHS. This is summarized overleaf.

	Year 1 £000s	Year 2 £000s	Year 3 £000s
Recurrent costs when fully implemented			
Change in cost for omega-3-acid ethyl esters	7,071	13,316	18,835
Change in cost for aldosterone antagonists	21,749	40,957	57,932
Change in cost for additional rehabilitation	17,810	17,810	17,810
Change in cost for patient engagement intervention	2,537	2,537	2,537
Change in cost for additional revascularisation assessment	8,521	8,521	8,521
Cost of implementing guidance on MI: secondary prevention	57,688	83,141	105,634
Opportunity savings when fully implemented			
Change in further MIs following omega-3-acid ethyl esters	-1,736	-3,271	-4,627
Change in hospitalisations due to heart failure following aldosterone antagonists	-2,433	-4,579	-6,480
Change in further MIs following additional rehabilitation	-1,765	-1,765	-1,765
Opportunity savings from implementing guidance on MI: secondary prevention	-5,934	-9,616	-12,872
Net cost of implementing guidance on MI: secondary prevention	51,754	73,525	92,762



Rehabilitation is outside the scope of 'Payment by results'; however, revascularisation assessments and procedures are within the scope of 'Payment by results' and so are costed at national tariff.

The secondary care element of this guideline and primary care prescribing is expected to fall within programme budgeting category 10A (problems of circulation – coronary heart disease), while the cardiac rehabilitation elements may fall within category 10A or 23 (other) depending on how the care is delivered.

Benefits and savings

Following implementation of this guidance, there will be benefits to both individuals and the NHS and social services.

The recommendations have been presented net of benefits where it has been possible to calculate these. The total amount of savings identified is £5.6 million in year 1.

Following implementation of this guidance, it is expected that 2,800 secondary MIs and a further 3,500 admissions for heart failure would be avoided in the first three years.

Other benefits that do not result in significant costs include reduced risk of mortality, reduced risk of subsequent revascularisation and lower treatment cost where a further MI occurs.

Local costing template

The costing template produced to support this guideline enables organisations in England, Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that additional costs of £107,000 could be incurred for a population of 100,000 in year 1.

1 Introduction

1.1 *Supporting implementation*

1.1.1 The NICE clinical guideline on MI: secondary prevention is supported by the following implementation tools available on our website www.nice.org.uk/CG048:

- costing tools
 - a national costing report; this document
 - a local costing template; a simple spreadsheet that can be used to estimate the local cost of implementation.
- a slide set; key messages for local discussion
- implementation advice; practical suggestions on how to address potential barriers to implementation
- audit criteria.

1.1.2 A practical guide to implementation, 'How to put NICE guidance into practice: a guide to implementation for organisations', is also available to download from the NICE website. It includes advice on establishing organisational level implementation processes as well as detailed steps for people working to implement different types of guidance on the ground.

1.2 *What is the aim of this report?*

1.2.1 This report provides estimates of the national cost impact arising from implementation of guidance on secondary prevention for patients following an MI in England. These estimates are based on assumptions made about current practice and predictions of how current practice might change following implementation.

1.2.2 This report aims to help organisations plan for the financial implications of implementing NICE guidance. . It is estimated that the guideline will take more than 10 years to fully implement because changes to medication prescribed are applicable only to

new patients presenting, and not for patients who have had an MI in the past. We have focused on the costs over the next three years, which is the typical financial planning horizon within the NHS.

- 1.2.3 This report does not reproduce the NICE guideline on secondary prevention in primary and secondary care for patients following an MI and should be read in conjunction with it (see www.nice.org.uk/CG048).
- 1.2.4 The costing template that accompanies this report is designed to help those assessing the resource impact at a local level in England, Wales or Northern Ireland. NICE clinical guidelines are developmental standards in the Department of Health's document '[Standards for better health](#)'. The costing template may help inform local action plans demonstrating how implementation of the guideline will be achieved.

1.3 *Epidemiology of MI*

- 1.3.1 CHD death rates vary with age, gender, socioeconomic status, ethnicity and UK geographic location. Death rates in men aged less than 75 years are three times as high as those in women; and death rates in affluent areas in the UK are half of those in deprived areas (Department of Health, 2003). People of South Asian origin have almost a 50% higher death rate compared with the general population.
- 1.3.2 The annual incidence of MI for men aged 30–69 is about 600 per 100,000 and for women about 200 per 100,000. The British Heart Foundation states the annual incidence to mortality rate for MI is between 2.0 and 2.5. An estimated incidence to mortality rate of 2.4 has been used to calculate the annual incidence of MI based on the average CHD mortality rates from 2002 to 2004 (British Heart Foundation, 2006).

- 1.3.3 In the costing model, the incidence to mortality rate can be altered depending on local knowledge or, if available, the incidence rate for the local area can be entered directly. The incidence rate is known to vary across the UK. The incidence rate is assumed constant over time, although it is believed that it may be declining over time.
- 1.3.4 In the UK, about 838,000 men and 394,000 women have previously had an MI (British Heart Foundation, 2004). Prevalence rates taken from the Health Survey for England 2003 (Joint Health Surveys Unit, 2004) have been used in the costing model to obtain prevalence figures by age for England only.
- 1.3.5 In the costing model, the prevalence rates can be altered according to local knowledge.

1.4 *Models of care*

- 1.4.1 In order to establish the model of care, we contacted clinicians involved in the secondary prevention of MI and discussed the current baseline treatment and how it may change following the implementation of this updated guidance. Where possible, this report has attempted to estimate the average national baseline, taking into account wider practice within the NHS rather than concentrating on centres of excellence.
- 1.4.2 The costing model does not reproduce costing tools already developed for use with other guidelines and technology appraisals. Where existing guidelines or appraisals have not yet been fully implemented, the costing tools for these should be referred to as appropriate.

2 Costing methodology

2.1 *Process*

- 2.1.1 We use a structured approach for costing clinical guidelines (see appendix A).

2.1.2 Information about secondary prevention in CHD is collected as part of the Quality and Outcomes Framework in primary care, and from hospital statistics in secondary care. These statistics have been used to inform the costing analysis; however, there were still areas where assumptions had to be made. We developed these assumptions and tested them for reasonableness with members of the Guideline Development Group (GDG) and key clinical practitioners in the NHS.

2.2 *Scope of the cost-impact analysis*

2.2.1 The guideline offers best practice advice on the care of adults who have had an MI. This includes patients following the early acute phase (which can be defined as 48 hours after admission, providing the patient is stable), and patients who have had a proven MI at some point in the past. It does not cover patients who have had a non-spontaneous MI or a non-atherosclerotic-induced MI.

2.2.2 The guideline does not cover diagnosis of an MI, interventions specific to the early phase of the acute MI, management of patients in accident and emergency departments, different methods of assessment of cardiac status before possible coronary revascularisation, or symptom control such as the management of angina. Therefore, these issues are outside the scope of the costing work.

2.2.3 The additional management of diabetes and glycaemic control in patients who have had an MI is more appropriately placed in the revisions of the diabetes guidelines. These issues are therefore outside the scope of the costing work.

2.2.4 The additional management of chronic heart failure would be more appropriately placed in revisions of the chronic heart failure guideline. This is therefore outside the scope of the costing work.

- 2.2.5 Due to the breadth and complexity of the guideline, we worked with the GDG and other professionals to identify the recommendations that would have the most significant resource impact (see table 1 overleaf).
- 2.2.6 Costing work has focused on these recommendations. Eleven of the recommendations in the guideline have been identified as key priorities for implementation, and two of these are also among the five recommendations considered to have significant resource impact.
- 2.2.7 One key priority recommendation covers the discharge summary and is not believed to have a significant resource impact.
- 2.2.8 Four of the key priority recommendations cover advice for patients and are not considered to have any significant resource impact above that already covered in existing NICE guidance.
- 2.2.9 One key priority recommendation covers equality of access to cardiac rehabilitation. It is believed that any costs incurred in this would be included in the two cardiac rehabilitation recommendations considered in this costing report.
- 2.2.10 Three of the key priority recommendations not listed in table 1 cover medications. It is not believed that these recommendations have any significant resource impact nationally.
- 2.2.11 We have limited the consideration of costs and savings to direct costs to the NHS that will arise from implementation. We have not included consequences for the individual, the private sector or the not-for-profit sector. Where applicable, any realisable cost savings arising from a change in practice have been offset against the cost of implementing the change.

Table 1 Recommendations with a significant resource impact

High-cost recommendations	Recommendation number	Key priority?
For patients who have had an MI within 3 months and who are not achieving 7 g of omega 3 fatty acids per week, consider providing at least 1 g daily of omega-3-acid ethyl esters treatment licensed for secondary prevention post MI for up to 4 years.	1.1.1.3	
All patients (regardless of their age) should be given advice about and offered a cardiac rehabilitation programme with an exercise component.	1.2.1.1	
Reminders such as: <ul style="list-style-type: none"> • telephone calls • telephone calls in combination with direct contact from a healthcare professional • motivational letters should be used to improve uptake of cardiac rehabilitation.	1.2.2.8	
For patients who have had an acute MI and who have symptoms and/or signs of heart failure and left ventricular systolic dysfunction, treatment with an aldosterone antagonist licensed for post-MI treatment should be initiated within 3–14 days of the MI, preferably after ACE inhibitor therapy.	1.3.8.1	✓
All patients should be offered a cardiological assessment to consider whether coronary revascularisation is appropriate. This should take into account comorbidity.	1.4.1	✓

2.3 General assumptions made

- 2.3.1 The model is based on annual incidence, prevalence and population estimates (see tables 2, 3 and 4).
- 2.3.2 The annual incidence rates have been calculated using the average CHD mortality rate per 100,000 for 2002–2004, multiplied by the estimated MI to CHD mortality rate (British Heart Foundation).

Table 2 Average CHD mortality rate per 100,000 for 2002–2004

Age	Males	Females
15–34	1.42	0.43
35–64	99.71	24.25
65–74	632.33	268.02
75+	2004.60	1391.66

Table 3: Estimated MI yearly incidence rates

Age	Males	Females
15–34	0.0034% (219)	0.00096% (62)
35–64	0.239% (23,340)	0.058% (5,833)
65–74	1.518% (30,047)	0.643% (14,146)
75+	4.811% (69,764)	3.340% (79,189)

Table 4 MI prevalence rates

Age	Males	Females
35–44	0.8% (30,332)	0.3% (11,631)
45–54	2.2% (69,019)	0.8% (25,643)
55–64	6.7% (189,319)	2.1% (61,307)
65–74	12.1% (239,585)	4.2% (92,374)
75+	19.6% (284,217)	8.1% (192,042)

- 2.3.3 The assumptions made to support the costs of specific recommendations are detailed in section 3 of this report.

2.4 *Basis of unit costs*

- 2.4.1 The way the NHS is funded has undergone reform with the introduction of 'Payment by results', based on a national tariff. The national tariff will be applied to all activity for which Healthcare Resource Groups (HRGs) or other appropriate case-mix measures are available. Where a national tariff price or indicative price exists for an activity this has been used as the unit cost; this has then been inflated by the national average market forces factor.
- 2.4.2 Using these prices ensures that the costs in the report are the cost to the primary care trust (PCT) of commissioning predicted changes in activity at the tariff price, but may not represent the actual cost to individual trusts of delivering the activity.
- 2.4.3 For new or developing services, where there is no national average unit cost, organisations already undertaking this activity have been asked their current unit cost.

3 Cost of significant resource-impact recommendations

3.1 *Omega-3-acid ethyl esters*

Background

- 3.1.1 For patients who have had an MI within 3 months and who are not achieving 7 g of omega 3 fatty acids per week, consider providing at least 1 g daily of omega-3-acid ethyl esters treatment licensed for secondary prevention post MI for up to 4 years.

Assumptions made

- 3.1.2 Very few patients are currently prescribed omega-3-acid ethyl esters following an MI. The opinion of the GDG is that 20% of patients having an MI in the last 3 months (ranging from 0% to 50%) may be suitable for and prescribed omega-3-acid ethyl esters following the adoption of this guidance.

- 3.1.3 The number of patients receiving omega-3-acid ethyl esters over time has been predicted using the estimated survival rates given in Levy et al. (2002) to estimate the number of patients between 0 and 4 years post MI.
- 3.1.4 The number of patients affected by this recommendation will therefore increase from 40,000 in year 1 to 104,000 following full implementation.
- 3.1.5 The probability of further MI without intervention is taken from the full guideline. The reduction in probability is derived from Lee and Lip (2003).
- 3.1.6 The number of further MIs without intervention in the group of patients who would be prescribed omega-3-acid ethyl esters is estimated as 2,400, 4,600, and 6,500 in years 1, 2 and 3 respectively.
- 3.1.7 The number of further MIs after prescription of omega-3-acid ethyl esters is estimated as 2,000, 3,600 and 5,200 in years 1, 2 and 3 respectively.
- 3.1.8 It is therefore estimated that there will be a reduction of 2,700 further MIs after prescription of omega-3-acid ethyl esters in the first three years.

Cost summary

- 3.1.9 The yearly cost per patient of omega-3-acid ethyl esters is £181 (BNF 53).
- 3.1.10 The cost of a further MI is taken as the national tariff for non-elective acute MI without complications (E12), uplifted by the average market forces factor (MFF) of 1.1249, which is £3587.
- 3.1.11 The net cost of omega-3-acid ethyl esters is summarised in table 5.

Table 5 Net cost of omega-3- acid ethyl esters

	Year 1 (£000s)	Year 2 (£000s)	Year 3 (£000s)
Cost of omega-3-acid ethyl esters	7,071	13,316	18,835
Savings from MIs avoided following omega-3-acid ethyl esters	-1,736	-3,271	-4,627
Net cost/saving (-)	5,335	10,045	14,208

3.2 *Aldosterone antagonists*

Background

- 3.2.1 For patients who have had an acute MI and who have symptoms and/or signs of heart failure and left ventricular systolic dysfunction, treatment with an aldosterone antagonist licensed for post-MI treatment should be initiated within 3–14 days of the MI, preferably after ACE inhibitor therapy.
- 3.2.2 Patients who have recently had an acute MI and have clinical heart failure and left ventricular systolic dysfunction, but who are already being treated with an aldosterone antagonist for a concomitant condition (for example, chronic heart failure), should continue with the aldosterone antagonist or an alternative, licensed for early post-MI treatment.
- 3.2.3 For patients who have had a proven MI in the past and heart failure due to left ventricular systolic dysfunction, treatment with an aldosterone antagonist should be in line with ‘Chronic heart failure’ (NICE clinical guideline 5).

Assumptions made

- 3.2.4 The opinion of the GDG is that 20% of patients having an MI in the recent past may be suitable for and prescribed an aldosterone antagonist, following the adoption of this guidance.

- 3.2.5 The only aldosterone antagonist currently licensed for use for patients post MI is eplerenone. Eplerenone could be prescribed for the lifetime of the patient.
- 3.2.6 The number of patients affected by this recommendation will therefore increase from 40,000 in year 1 to 104,000 in year 3.
- 3.2.7 The probability of admission for heart failure and the reduction in risk after aldosterone antagonist treatment is taken from the full guideline.
- 3.2.8 The number of admissions for heart failure without intervention in the group of patients who would be prescribed eplerenone is estimated as 5,500, 10,300 and 14,600 in years 1, 2 and 3 respectively.
- 3.2.9 The number of admissions for heart in the same group of patients after prescription of eplerenone is estimated as 4,200, 7,900 and 11,200 in years 1, 2 and 3 respectively.
- 3.2.10 It is therefore estimated that there will be a reduction of 7,000 admissions for heart failure after prescription of eplerenone in the first three years.

Cost summary

- 3.2.11 The yearly cost per patient of eplerenone is £557.
- 3.2.12 The net cost of aldosterone antagonists is summarised in table 6.

Table 6 Net cost of aldosterone antagonists

	Year 1 (£000s)	Year 2 (£000s)	Year 3 (£000s)
Cost of aldosterone antagonists	21,749	40,957	57,932
Savings from admissions for heart failure avoided following aldosterone antagonists	-2,433	-4,579	-6,480
Net cost/saving (-)	19,316	36,378	51,452

3.3 Cardiac rehabilitation

Background

- 3.3.1 All patients after an MI (regardless of their age) should be given advice about and offered a cardiac rehabilitation programme with an exercise component.
- 3.3.2 Cardiac rehabilitation should be equally accessible and relevant to all patients after an MI, particularly people from groups that are currently less likely to access this service. These include people from black and minority ethnic groups, older people, people from lower socioeconomic groups, women, people from rural communities and people with mental and physical health comorbidities.

Assumptions made

- 3.3.3 Current referrals to cardiac rehabilitation programmes are estimated as 45–67% of patients discharged from hospital with primary diagnosis of acute MI (Beswick et al. 2004). The model assumes that 56% (the midpoint of the above estimates) of patients experiencing an MI are currently referred to cardiac rehabilitation.
- 3.3.4 This equates to 125,000 people in England currently referred to cardiac rehabilitation programmes after an MI annually.
- 3.3.5 The same study identifies 73–81% of patients with acute MI as being suitable for cardiac rehabilitation. The model assumes that provision of rehabilitation will be necessary for 77% of patients (the midpoint of the above estimates).

- 3.3.6 This equates to 171,000 people after an MI in England referred to a cardiac rehabilitation scheme after implementation of the guidance, an increase of 47,000 annually.
- 3.3.7 Both these assumptions are flexible to allow for local circumstances.
- 3.3.8 The cost per patient of cardiac rehabilitation is taken as the average cost given in Beswick et al. This equates to £381 per referral.
- 3.3.9 The probability of further MI and the reduction in risk after cardiac rehabilitation is taken from the full guideline.
- 3.3.10 The number of further MIs without intervention in the group of patients who would be referred for cardiac rehabilitation is estimated as 2,900 yearly.
- 3.3.11 The number of further MIs in the same group of patients following referral to cardiac rehabilitation is estimated as 2,400.
- 3.3.12 It is therefore estimated that there will be a reduction of 500 further MIs following the increase in cardiac rehabilitation referrals.

Cost summary

- 3.3.13 There are further costs associated with encouraging uptake of rehabilitation.
- 3.3.14 This cost ranges from £15 per referral based on two reminder letters to £47 per referral based on four home visits by a social worker and a follow-up phone call by a specialist nurse. The cost used in the model is for two reminder letters per patient.
- 3.3.15 The cost of a further MI is taken as the national tariff for non-elective acute MI without complications (E12), uplifted by the average MFF of 1.1249, which is £3587.
- 3.3.16 The net cost of cardiac rehabilitation is summarised in table 7.

Table 7 Net cost of cardiac rehabilitation

	Current cost (£000s)	Predicted cost (£000s)	Change in cost (£000s)
Cost of cardiac rehabilitation	47,794	65,304	17,810
Cost of further MIs following cardiac rehabilitation	10,395	8,630	-1,765
Cost of patient engagement intervention	0	2,537	2,357
Net cost/saving (-)			18,582

Other considerations

- 3.3.17 There may be additional costs associated with the development and set-up of cardiac rehabilitation services.
- 3.3.18 This will be dependent on local existing circumstance and on the setting of any additional services, for example in primary or secondary care. There are various different models for providing cardiac rehabilitation services. The model used locally will alter the costs associated with increasing uptake.

3.4 Coronary revascularisation assessment

Background

- 3.4.1 All patients should be offered a cardiological assessment to consider whether coronary revascularisation is appropriate. This should take into account comorbidity.

Assumptions made

- 3.4.2 The Myocardial Infarction National Audit Project has been used to determine the number of patients currently receiving an assessment, although this is unpublished preliminary data in draft form only.
- 3.4.3 The percentage of hospitals either routinely performing angiography for post-MI patients or performing angiography after an assessment of risk for post-MI patients is 69.5% for ST-

segment-elevation infarction and 86.5% for non-ST-segment-elevation infarction.

- 3.4.4 The percentage of patients estimated as receiving an assessment was then assumed to be 78%, which is the average of the above figures.
- 3.4.5 The number of patients currently referred for an assessment is estimated as 174,000.
- 3.4.6 The actual percentage referred for assessment can be amended to reflect local circumstances.
- 3.4.7 If all patients receive a cardiac assessment after an MI, the number of referrals is expected to rise to 223,000; an increase of 49,000.
- 3.4.8 This costing report does not include the cost of any additional revascularisations, as this is outside the scope of the guidance.

Cost summary

- 3.4.9 The cost of a cardiological assessment is taken from the national tariff for a first cardiology outpatient appointment, uplifted by the average MFF for England of 1.1249, which is £174.
- 3.4.10 The net cost of coronary revascularisation assessments is summarised in table 8.

Table 8 Net cost of coronary revascularisation assessments

	Current cost (£000s)	Predicted cost (£000s)	Change in cost (£000s)
Cost of assessments	30,211	38,732	8,521
Net cost/saving (-)			8,521

Other considerations

- 3.4.11 The scope of the guideline does not include the method of cardiological assessment; hence no account of this has been made in the costing report.

- 3.4.12 The cost benefits of any health improvements resulting from additional revascularisation procedures are not included in the costing report.

4 Sensitivity analysis

4.1 Methodology

- 4.1.1 There are a number of assumptions in the model for which no empirical evidence exists. Because of the limited data, the model developed is based mainly on discussions of typical values and predictions of how things might change as a result of implementing the guidance and is therefore subject to a degree of uncertainty.
- 4.1.2 As part of discussions with practitioners, we discussed possible minimum and maximum values of variables, and calculated their impact on costs across this range.
- 4.1.3 Wherever possible we have used the national tariff plus market forces factor to determine cost. We used the variation of costs for the 25th and 75th percentiles from reference costs compared with the reference cost national average as a guide to inform the maximum and minimum range of costs.
- 4.1.4 It is not possible to arrive at an overall range for total cost because the minimum or maximum of individual lines would not occur simultaneously. We undertook one-way simple sensitivity analysis, altering each variable independently to identify those that have greatest impact on the calculated total cost.
- 4.1.5 Appendix B contains a table detailing all variables modified and the key conclusions drawn are discussed below.

4.2 *Impact of sensitivity analysis on costs*

Incidence and prevalence

4.2.1 The sensitivity analysis investigates the effect of incidence figures 10% higher and lower than that calculated. It also investigates the effect of altering the incidence to mortality rate to the extremes of that estimated. This alters the cost of the guideline by up to £10.8 million in the first year.

Annual drug costs

4.2.2 The percentage of patients prescribed omega-3-acid ethyl esters or aldosterone antagonists is varied between the limits suggested by the GDG.

4.2.3 Varying the number of people receiving these drugs in this way alters the cost of implementing the guideline by up to £54.4 million in the first year.

Cardiac rehabilitation

4.2.4 The current level of referrals is varied from the minimum to the maximum of that given in Beswick et al. (2004).

4.2.5 The future level of referrals is varied from the minimum to the maximum of that given in Beswick et al. (2004).

4.2.6 The cost of cardiac rehabilitation is varied from the minimum to the maximum of that given in Beswick et al. (2004).

4.2.7 The cost of the patient engagement intervention is varied from letters alone to visits and telephone calls.

4.2.8 These variations alter the cost of implementing the guideline by up to £30.9 million.

Coronary revascularisation assessment

4.2.9 The percentage increase in patients receiving cardiological assessment is varied by 10% in each direction.

- 4.2.10 The cost of cardiological assessment is varied from a follow-up cardiology appointment to a first vascular surgery outpatient appointment.
- 4.2.11 These variations alter the cost of implementing the guideline by up to £4.8 million.

Conclusion

- 4.2.12 The cost is most sensitive to the number of patients prescribed either omega-3-acid ethyl esters or aldosterone antagonists. There is limited evidence as to how prescribing patterns will change after the introduction of this guidance. Additional information should be sought locally about the appropriate percentage change in prescribing patterns for these two classes of drug.

5 Impact of guidance for commissioners

- 5.1.1 The cost of updating prescribing patterns will be mainly in primary care.
- 5.1.2 Additional cardiac rehabilitation programmes will need to be commissioned and could be undertaken in either a primary care or secondary care setting. The setting of the programme will influence its cost. Rehabilitation is currently excluded from 'Payment by results'.
- 5.1.3 Additional access to cardiac revascularisation may need to be commissioned as a result of the increased access to assessment.
- 5.1.4 The secondary care element of this guideline and primary care prescribing is expected to fall within programme budgeting category 10A (problems of circulation – coronary heart disease), while the cardiac rehabilitation elements may fall within category 10A or 23 (other) depending on how the care is delivered.

6 Conclusion

6.1 Total national cost for England

6.1.1 Using the significant resource-impact recommendations shown in table 1 and assumptions specified in section 3 we have estimated the annual cost impact of implementing the guideline in England to be £51.8 million in the first year. Table 9 shows the breakdown of cost of each significant resource-impact recommendation.

Table 9 Recurrent costs of implementing guidance

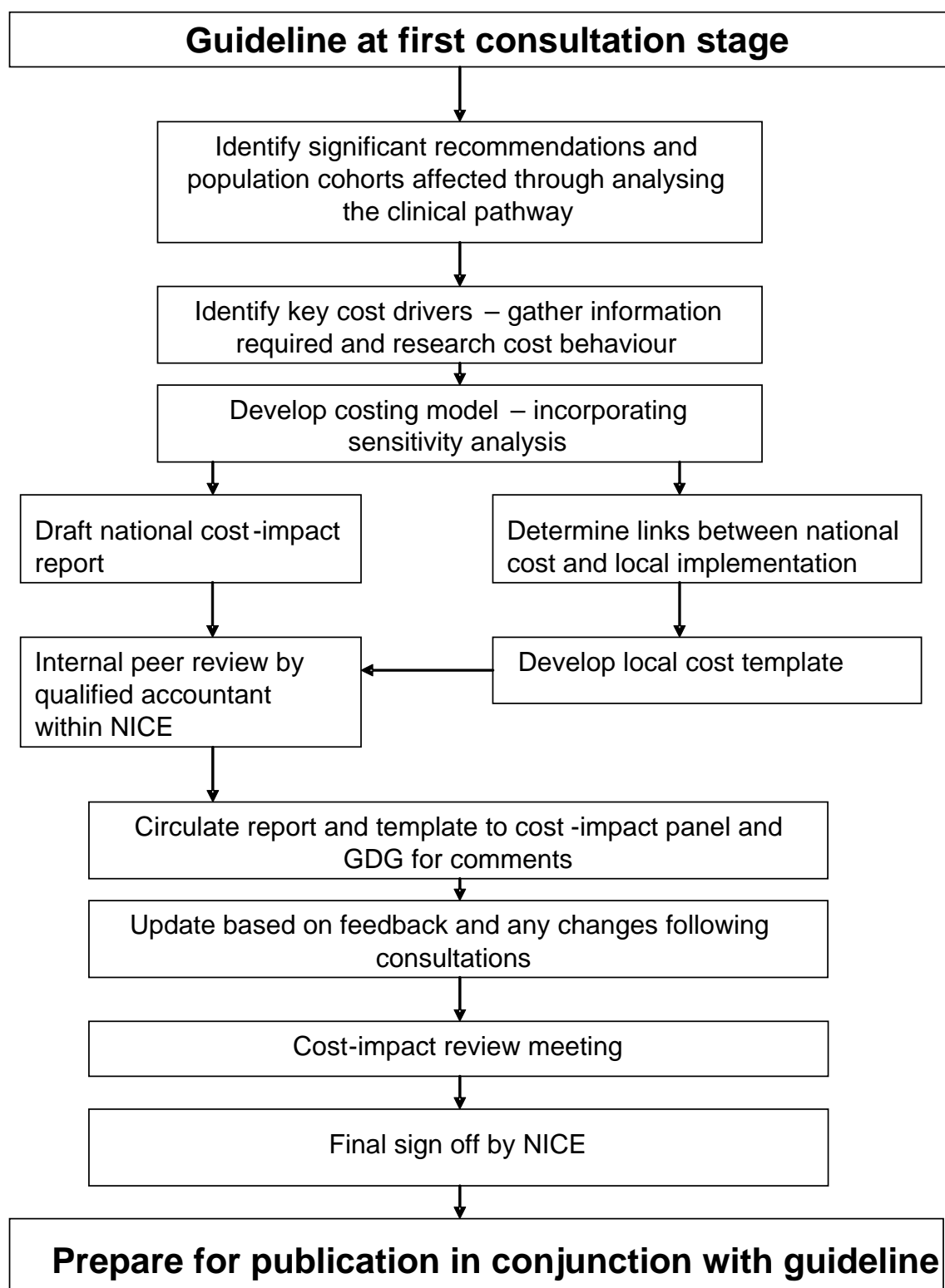
	Year 1	Year 2	Year 3
Recurrent costs when fully implemented	£000s	£000s	£000s
Change in cost for omega-3-acid ethyl esters	7,071	13,316	18,835
Change in cost for aldosterone antagonists	21,749	40,957	57,932
Change in cost for additional rehabilitation	17,810	17,810	17,810
Change in cost for patient engagement intervention	2,537	2,537	2,537
Change in cost for additional revascularisation assessment	8,521	8,521	8,521
Cost of implementing guidance on MI: secondary prevention	57,688	83,141	105,634
Opportunity savings when fully implemented			
Change in further MIs following omega-3-acid ethyl esters	-1,736	-3,271	-4,627
Change in hospitalisations due to heart failure following aldosterone antagonists	-2,433	-4,579	-6,480
Change in further MIs following additional rehabilitation	-1,765	-1,765	-1,765
Opportunity savings from implementing guidance on MI: secondary prevention	-5,934	-9,616	-12,872
Net cost of implementing guidance on MI: secondary prevention	51,754	73,525	92,762

- 6.1.2 We applied reality tests against existing data wherever possible, but this was limited by the availability of detailed data. We consider this assessment to be reasonable, given the limited detailed data regarding diagnosis and treatment paths and the time available. However, the costs presented are estimates and should not be taken as the full cost of implementing the guideline.
- 6.1.3 Because some of the recommendations apply only within 14 days of an MI, full implementation of this guideline will take approximately 10 years. We have estimated costs for the next three years which is the typical financial planning horizon for the NHS.

6.2 *Next steps*

- 6.2.1 The local costing template produced to support this guideline enables organisations such as primary care trusts (PCTs) or health boards in Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that a population of 100,000 could expect to incur additional costs of £107,000 in the first year. Use this template to calculate the cost of implementing this guidance in your area.

Appendix A. Approach to costing guidelines



Appendix B. Results of sensitivity analysis

Assessment of sensitivity costs to a range of variables							
Parameter varied	Baseline value	Minimum value	Maximum value	Baseline cost £000s	Minimum cost £000s	Maximum cost £000s	Change £000s
Incidence rates							
Incidence of MI to CHD mortality rate	2.4	2	2.5	51,754	43,128	53,908	10,780
Incidence of MI in adults	222,600	200,340	244,860	51,754	49,043	54,461	5,418
Numbers receiving each treatment							
Percentage prescribed omega-3-acid ethyl esters	20%	0%	50%	7,071	0	17,677	17,677
Percentage prescribed aldosterone antagonists	20%	0%	50%	21,749	0	54,372	54,372
Additional percentage referred to cardiac rehabilitation	21%	6%	36%	17,810	5,089	30,532	25,443
Additional percentage receiving cardiological assessment	22%	20%	24%	8,521	7,746	9,296	1,550
Costs							
Variation in the cost of cardiac rehabilitation	£347	£50	£712	17,810	2,337	33,283	30,946
Variation in the cost of rehabilitation patient engagement	£15	£15	£47	2,537	2,537	8,056	5,519
Variation in the cost of cardiological assessment	£174	£90	£189	8,521	4,407	9,256	4,849

Appendix C. References

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