

Acutely ill patients in hospital

Costing report

Implementing NICE guidance

July 2007

NICE clinical guideline 50



This costing report accompanies the clinical guideline: 'Acutely ill patients in hospital: recognition of and response to acute illness in adults in hospital' (available online at www.nice.org.uk/CG050).

Issue date: July 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. 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 'Acutely ill patients in hospital: recognition of and response to acute illness in adults in hospital' 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

The NICE clinical guideline on acutely ill patients in hospital is supported by a range of implementation tools available on our website

www.nice.org.uk/CG050 and detailed in the main body of this report.

Significant resource-impact recommendations

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:

- use of track and trigger systems and impact on taking patient observations
- impact on bed capacity
- education and training

Total cost impact

It has not been possible to estimate the national cost impact arising from implementation of this guideline. Discussions with clinicians indicate three main areas in which change will be required but the extent and impact of the changes is subject to considerable uncertainty because baseline provision varies considerably in different NHS organisations.

This report discusses the key items to be considered and potential impact arising from implementation. We estimate that there may be an opportunity cost of £3 million in order to improve observation taking. However, this cost

may be borne disproportionately across the NHS, depending on whether early warning systems have already been introduced.

The requirement to reduce transfers from critical care between 22.00 and 07.00 may impact on bed capacity. The impact depends on local circumstances and whether the capacity constraint is at the ward level or at the critical care level. As noted below there are inter-related consequences of implementation that also impacts on bed capacity.

Similarly the cost of training will depend on what training is already taking place and how this can be adapted, or added to in order to meet the recommendations.

Benefits and savings

Benefits and savings from implementing this guideline are likely to relate to:

- reduced admissions to critical care
- lower lengths of stay in critical care and on general wards
- reduced clinical negligence claims

Implementing the clinical guideline is anticipated to reduce the number of patients whose deteriorating condition is not recognised or acted upon sufficiently rapidly. In a recent National Confidential Enquiry into Patient Outcomes and Death (NCEPOD 2005) admission to an intensive care unit was thought to have been avoidable in 21% of cases, and the authors felt that suboptimal care contributed to about a third of the deaths which ultimately occurred in Intensive Care.

Early recognition and intervention should reduce patient mortality, morbidity and length of stay both in the hospital overall and in a critical care area. However, an ageing population and increasing demands on the service may mean that savings achieved through better management may not reduce the overall cost, but could reduce the additional investment required.

In addition to savings arising from lower lengths of stay, there is the potential to avoid costs associated with clinical negligence claims. Compliance with

NICE guidance is one of the criteria indicating good risk reduction strategies and, in combination with meeting other criteria, could lead to a discount on CNST (clinical negligence scheme for trusts) premiums. Furthermore, although it was not identified as a significant implementation resource issue, the guideline makes recommendations regarding record keeping, which also features as part of the CNST criteria.

Local costing template

The costing template produced to support this guideline enables organisations in England, Wales and Northern Ireland to estimate the impact locally even though we have not provided a national estimate. It should be possible to use local data and knowledge to develop the assumptions in the three areas that we have noted below to gain an appreciation of the local impact.

Introduction

1.1 *Supporting implementation*

1.1.1 The NICE clinical guideline on acutely ill patients in hospital is supported by the following implementation tools available on our website, www.nice.org.uk/CG050:

- 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 discusses cost impact arising from implementation of guidance on acutely ill patients in hospital. Variability in baseline and uncertainties regarding the impact arising from implementation of the recommendations means that a national cost estimate is not possible.

1.2.2 This report aims to help organisations plan for the financial implications of implementing NICE guidance.

- 1.2.3 This report does not reproduce the NICE guideline on acutely ill patients in hospital and should be read in conjunction with it (see www.nice.org.uk/CG050).
- 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 acute illness in patients in hospital*

- 1.3.1 Clinical deterioration can occur at any stage of a patient's illness, although there are certain periods during which a patient is more vulnerable, such as at the onset of illness, during surgical or medical intervention and during recovery from critical illness.
- 1.3.2 Patients on general adult wards who are at risk of deteriorating may be identified before a serious adverse event by changes in physiological observations recorded by clinical staff. The identification of physiological deterioration and initiation of appropriate clinical management is of crucial importance to minimise the likelihood of serious adverse events, including cardiac arrest and death and the requirement for admission to critical care.
- 1.3.3 There is a consistent body of evidence that shows that patients who become, or are at risk of becoming, acutely unwell on general hospital wards receive suboptimal care. A report by the National Confidential Enquiry into Patient Outcome and Death ('An acute problem', NCEPOD 2005) identified delayed recognition and referral as prime causes of the substandard care of the acutely unwell in hospital. The report authors considered that admission to critical care could have been avoidable in 21% of cases and that

suboptimal care contributed to about a third of the deaths that occurred.

1.4 *Models of care*

- 1.4.1 The current model of care varies considerably between different providers, and sometimes even between different wards within a hospital. Basic observations are taken for the majority of admissions, but differences may arise in how observations are taken and when they trigger a response.
- 1.4.2 The Guideline Development Group needed to balance making clear recommendations about the level and nature of the response with the absence of evidence regarding optimal configuration. Given this, the GDG considered that the optimal configuration of response should be agreed and delivered locally. The guideline includes recommendations specifying some elements that should be included in the model of care, while also allowing for some variation in local configuration.
- 1.4.3 Consequently, it has not been possible to cost any specific model of care, and in considering the potential costs and savings arising from implementation of this guideline we have focussed on what needs to happen and made basic assumptions regarding what grade of staff might intervene, without precisely defining who should intervene.

2 *Costing methodology*

2.1 *Process*

- 2.1.1 We use a structured approach for costing clinical guidelines (see appendix A).
- 2.1.2 Little information has been systematically collected about the incidence of patients becoming acutely ill, and this led to problems in building a comprehensive bottom-up model for costing (a costing

methodology where the unit cost of individual elements and number of units are estimated and added together to provide a total cost). This was confounded by a number of organisations already working in a way that matches some of the recommendations either fully or in part. It is difficult to distinguish between improvements that arise from implementing a suite of different interventions. It is also very difficult to assess how many patients may have been identified early and for how many action has prevented exacerbation.

- 2.1.3 These limitations mean it was not possible to develop a national costing model. Instead of a costing model we discuss the main issues in this report and provide a costing template that can be used locally, using local knowledge to estimate the impact.

2.2 *Scope of the cost-impact analysis*

- 2.2.1 The guideline offers best practice advice on the care of adults in acute hospital settings who become acutely ill.
- 2.2.2 The guidance does not cover dying patients who are receiving palliative care, or children, or patients in critical care areas who are directly under the care of a critical care consultant. Therefore, these patients are outside the scope of the costing work. Following discussions with members of the GDG we assumed that day case patients were included, but not inpatients with mental health or learning difficulties unless they are being treated for an acute illness.
- 2.2.3 We worked with the GDG and other professionals to identify the recommendations that would have the most significant resource-impact (see table 1). Costing work has focused on these recommendations.

Table 1 Recommendations with a significant resource impact

High-cost recommendations	Recommendation number	Key priority?
<p>Adult patients in acute hospital settings, including patients in the emergency department for whom a clinical decision to admit has been made, should have:</p> <ul style="list-style-type: none"> • physiological observations recorded at the time of their admission or initial assessment • a clear written monitoring plan that specifies which physiological observations should be recorded and how often. The plan should take account of the: <ul style="list-style-type: none"> – patient's diagnosis – presence of comorbidities – agreed treatment plan. <p>Physiological observations should be recorded and acted upon by staff who have been trained to undertake these procedures and understand their clinical relevance.</p>	1.2.2.1	✓
<p>As a minimum, the following physiological observations should be recorded at the initial assessment and as part of routine monitoring:</p> <ul style="list-style-type: none"> • heart rate • respiratory rate • systolic blood pressure • level of consciousness • oxygen saturation • temperature. 	1.2.2.2	
<p>Physiological track and trigger systems should be used to monitor all adult patients in acute hospital settings.</p> <ul style="list-style-type: none"> • Physiological observations should be monitored at least every 12 hours, unless a decision has been made at a senior level to increase or decrease this frequency for an individual patient. • The frequency of monitoring should increase if abnormal physiology is detected, as outlined in the recommendation on graded response strategy (recommendation 1.2.2.10). 	1.2.2.3	✓
<p>Staff caring for patients in acute hospital settings should have competencies in monitoring, measurement, interpretation and prompt response to the acutely ill patient appropriate to the level of care they are providing. Education and training should be provided to ensure staff have these competencies, and they should be assessed</p>	1.2.2.7	✓

to ensure they can demonstrate them.		
After the decision to transfer a patient from a critical care area to the general ward has been made, he or she should be transferred as early as possible during the day. Transfer from critical care areas to the general ward between 22.00 and 07.00 should be avoided whenever possible, and should be documented as an adverse incident if it occurs.	1.2.2.14	✓
Staff working with acutely ill patients on general wards should be provided with education and training to recognise and understand the physical, psychological and emotional needs of patients who have been transferred from critical care areas.	1.2.2.17	

2.2.4 Seven of the recommendations in the guideline have been identified as key priorities for implementation, and four of these are also among the six recommendations considered to have significant resource impact. These six recommendations are concerned with three main themes:

- use of track and trigger and impact on taking patient observations
- impact on bed capacity
- education and training

2.2.5 The key priorities that have not been costed related to graded response strategy and communication between clinicians, particularly communication between critical care areas and wards when patients are being transferred. These were not considered to significantly impact on resources.

2.2.6 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 considered.

2.3 *General assumptions made*

- 2.3.1 Unlike a specific disease for which incidence and prevalence statistics are available, any patient admitted to hospital may be at risk of their condition deteriorating. Precise numbers who are at most risk are unknown; effective management is already dealing with the risks and preventing deterioration in some cases, which makes the figures more difficult to interpret.
- 2.3.2 The cost estimates we have calculated are based on number of relevant hospital episodes. In order to be compatible with the scope, relevant episodes exclude specialties such as learning difficulties and mental illness and cases in which the patient is younger than 16 years.

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 or other appropriate case-mix measures are available. At present critical care is excluded from the scope of Payment by Results.
- 2.4.2 We have estimated the impact on ward staffing of increased time spent on observation. This cost is based on Agenda for Change bandings, with employers' costs for superannuation and national insurance contributions included.

3 Cost of significant resource-impact recommendations

3.1 *Patient observations*

Background

3.1.1 A number of recommendations relate to undertaking physiological observations and having a system in place to monitor, interpret and respond to deteriorating patients. These recommendations include the following.

- Adult patients in acute hospital settings, including patients in the emergency department for whom a clinical decision to admit has been made, should have:
 - physiological observations recorded at the time of their admission or initial assessment
 - a clear written monitoring plan that specifies which physiological observations should be recorded and how often. The plan should take account of the:
 - ◇ patient's diagnosis
 - ◇ presence of comorbidities
 - ◇ agreed treatment plan.

Physiological observations should be recorded and acted upon by staff who have been trained to undertake these procedures and understand their clinical relevance. (recommendation 1.2.2.1)

- As a minimum, the following physiological observations should be recorded at the initial assessment and as part of routine monitoring:
 - heart rate
 - respiratory rate
 - systolic blood pressure
 - level of consciousness

- oxygen saturation
- temperature. (recommendation 1.2.2.2)
- Physiological track and trigger systems should be used to monitor all adult patients in acute hospital settings.
 - Physiological observations should be monitored at least every 12 hours, unless a decision has been made at a senior level to increase or decrease this frequency for an individual patient.
 - The frequency of monitoring should increase if abnormal physiology is detected. (recommendation 1.2.2.3)

3.1.2 There is a consistent body of evidence that shows that patients who become, or who are at risk of becoming, acutely unwell on general hospital wards receive suboptimal care. On a number of occasions follow-up on adverse events, such as the National Confidential Enquiry into Patient Outcome and Death (NCEPOD), found that deterioration in physiology was documented in patient notes but not acted upon. Section 3.2 deals with the training issues arising from this. However, the GDG also considered that adequate patient observation systems may require additional resourcing.

3.1.3 Physiological track and trigger systems rely on periodic observation of selected basic physiological signs, with predetermined calling or response criteria; these are also known as early warning systems (EWS). These systems allow a large number of patients to be monitored without a large increase in workload.

3.1.4 Based on the evidence available, the GDG considered that it was important to specify what physiological elements should be monitored. The GDG did not specify which track and trigger system to use because no system was identified that had been validated in a variety of populations and settings.

- 3.1.5 Similarly, the GDG identified the need for a graded response to triggers. However, this could be delivered by a range of service configurations, and NHS trusts should decide which configuration was most appropriate to local service needs.

Assumptions made

- 3.1.6 In estimating a national cost we assumed that basic observations were already being undertaken. However, clinical opinion suggested that some wards may need to change observations to include all the recommended elements – particularly respiratory rate and oxygen saturation, which may not traditionally have been recorded.
- 3.1.7 The NCEPOD report 'An acute problem' (2005) investigated hospitals' use of track and trigger systems and found that 73% used them in 2003 (the period under investigation). A more recent evaluation of outreach services in critical care indicated that 94.7% of the trusts surveyed were using track and trigger systems. However, this could be skewed because it was based on organisations that had critical care outreach services. Trusts that have outreach services are more likely to introduce track and trigger systems.
- 3.1.8 We have taken the midpoint of the two studies and assumed that 84% of acute trusts currently use track and trigger systems. As mentioned in the scope of the guideline, it may not be appropriate to use track and trigger systems for all patients, including patients who have chosen not to be resuscitated or who are receiving palliative care, and those already in critical care areas. This is estimated to account for 10% of patients, so an estimated 90% of patients may be subject to physiological monitoring. Nationally, this is estimated to affect 2.7 million patient bed days.
- 3.1.9 Clinical opinion indicates that increasing the number of elements observed could add 2 minutes per patient per observation, with a

minimum of two observations per day. This equates to 181,000 additional nursing hours.

- 3.1.10 Assuming that the observations will be taken by a qualified nurse on Agenda for Change band 5 working 37.5 hours per week for 42 weeks of the year (allowing for annual leave and training) the hourly cost will be £16.66 per hour.

Cost summary

- 3.1.11 The estimated national cost of increased time for observations to include all items specified in recommendation 1.2.2.2 of the guideline is £3,015,000. This is not expected to be an additional cost to the health service, it is more likely to be an opportunity cost of staff time diverted from other activities into extra time spent on patient observations.

Other considerations

- 3.1.12 The NHS Institute for Innovation and Improvement is currently promoting an initiative 'Releasing time to care: the productive ward'. (further details available at www.institute.nhs.uk/quality_and_value/productivity_series/productive_ward.html). One objective is to increase the amount of time spent with patients, and this may help to identify improvements that could be made in other areas (such as drug rounds) to enable increased observations to occur.
- 3.1.13 The implementation and resource impact of this recommendation depends on the starting position in a local area. NHS trusts and wards that have already implemented track and trigger systems may already be compliant with the recommendations. The impact is likely to fall disproportionately on those NHS trusts and wards that do not routinely monitor all the recommended physiological measurements.

- 3.1.14 There may be a need to change the forms used to document observations if they do not include space for all the recommended physiological factors. Documentation and record keeping is a key element of the CNST standards. Reviewing procedures and documentation will assist in demonstrating compliance with these standards.

3.2 *Education and training*

Background

- 3.2.1 Two recommendations relate specifically to training.
- Staff caring for patients in acute hospital settings should have competencies in monitoring, measurement, interpretation and prompt response to the acutely ill patient appropriate to the level of care they are providing. Education and training should be provided to ensure staff have these competencies, and they should be assessed to ensure they can demonstrate them. (recommendation 1.2.2.7)
 - Staff working with acutely ill patients on general wards should be provided with education and training to recognise and understand the physical, psychological and emotional needs of patients who have been transferred from critical care areas. (recommendation 1.2.2.17)
- 3.2.2 As referred to above (3.1.2) evidence suggests that patients can be identified as becoming acutely unwell through changes in their physiological signs. However, there are occasions when observations are recorded but not interpreted or acted upon (NCEPOD 2005).
- 3.2.3 The GDG considered that having appropriately trained staff was a key priority for implementation. Training was considered to be relevant for all staff caring for patients on acute wards, including

healthcare support workers, who may be the ones taking initial observations.

- 3.2.4 The ways in which training can be provided varies considerably, from staff attending recognised courses to informal training within the ward area. Two courses we are aware of are the AIM (acute illness management) course, which is given in 13 NHS trusts across the Greater Manchester area, and the ALERT (acute life-threatening events recognition and treatment) course (www.alert-course.com), which is available in centres across the UK.
- 3.2.5 Informal training could be delivered by nurse educators who are based on acute wards, or by staff who are part of critical care outreach services.

Cost summary

- 3.2.6 It is not possible to determine a national cost for this element. This needs to be considered and estimated locally. There is little data available nationally regarding how many staff are trained in the recognition and management of acutely ill patients in order to determine the baseline level of provision.
- 3.2.7 Factors to be taken into consideration when determining the local cost are:
- Current training provision – can this be adapted or amended to provide adequate training at no additional cost. For example, including it within pre-registration training or as part of induction.
 - Number of staff requiring training – this includes nurses, healthcare support workers, professions allied to medicine and doctors.
 - How training is to be delivered – ward based training or attending a structured course.
 - For ward based training – grade of staff delivering the course, the cost of training the trainer.

- For attending a course – staff to cover absence if ward training allowances will be exceeded.

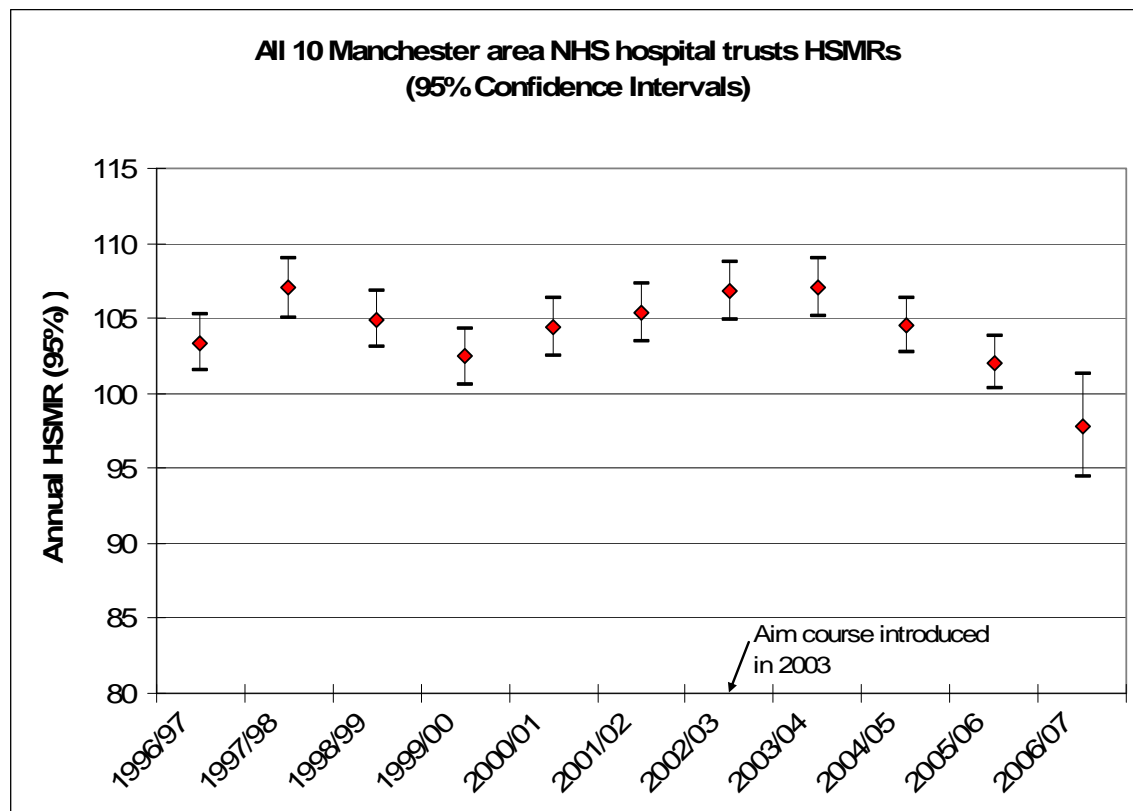
3.2.8 As with the costs for patient observations, the impact of the staff training recommendations will depend on the current systems used and training already provided within each NHS trust.

Other considerations

3.2.9 One of the reasons for developing the guidance was to improve patient outcomes through better recognition of the acutely unwell and appropriate action being taken in a timely manner. Training is one means of ensuring that improvements are made, and if implementing other recommendations in this guideline requires change then training will be an essential part of implementing any changes.

3.2.10 Greater Manchester introduced their AIM course following a pilot in 2003, and about 5000 candidates from 13 acute hospitals have completed the course. Although it is difficult to attribute causation, recent statistics show that the hospital standardised mortality ratios have improved considerably following this introduction. The national underlying trend is 98% (because the data are normalised to the previous year and there is a constant overall reduction of 2% per year). The reductions seen in Manchester are over and above this underlying reduction, as demonstrated in figure 1.

Figure 1 Reduction in hospital standardised mortality ratios for Greater Manchester



3.2.11 As stated above it is difficult to attribute cause to this reduction, but there has not been any significant change in demographics that would otherwise explain it. Therefore, staff in Manchester consider that the introduction of the AIM course has contributed.

3.3 *Bed capacity*

Background

3.2.12 The GDG made one recommendation regarding transfer of patients from critical care to general wards.

- After the decision to transfer a patient from a critical care area to the general ward has been made, he or she should be transferred as early as possible during the day. Transfer from critical care areas to the general ward between 22.00 and 07.00 should be avoided whenever possible, and should be

documented as an adverse incident if it occurs.

(recommendation 1.2.2.14)

- 3.2.13 The above recommendation was made because research demonstrates worse outcomes for patients transferred at night, including an increased hospital mortality rate and a higher critical care re-admission rate. Clinicians we spoke with considered that some of the transfers at night occur prematurely because of an assessment of their needs relative to other patients requiring critical care beds.
- 3.2.14 Anecdotal evidence indicates that some transfers happen at night for patients who were well enough to be on general wards, but have remained in critical care because of a lack of beds on general wards. Irrespective of the fitness of the patient, a transfer at night limits the opportunity for a formal structured handover and to prepare the patient and, if they agree, their family and carers.
- 3.2.15 Additional critical care beds could reduce the requirement for premature transfer if a more seriously ill patient needs the bed. Similarly, if the capacity constraint is at the general ward level then additional general beds will enable timely transfers, thus freeing up critical care beds.
- 3.2.16 Implementation of other recommendations is also likely to impact on bed capacity. The NCEPOD report estimates that a transfer to critical care was thought to have been avoidable in 21% of cases. Appropriate identification and management of patients at risk of becoming acutely unwell could therefore reduce admissions to critical care.
- 3.2.17 In addition to avoiding the need for transfer to critical care, early identification and management that avoids a patient becoming acutely unwell is associated with reduced length of stay, reduced readmissions and reduced risk of cardiac arrest and death. The benefits to general wards may be considerable because only a

small fraction of patients admitted to hospital require an unplanned transfer to critical care, and there are significantly more patients on general wards.

Cost summary

- 3.2.18 It is not possible to determine a national cost for this element. It needs to be considered and estimated locally because local circumstances, such as the mix of general and critical care beds and local bed management policies, will vary.
- 3.2.19 Consideration of bed occupancy rates and records of time of transfer from critical care (as collected for the Intensive Care National Audit and Research Centre [ICNARC] audits) will help to identify where the capacity constraints occur. The ICNARC dataset will help identify delayed discharges that should be assessed in conjunction with occupancy data.
- 3.2.20 The potential for reduced lengths of stay on general wards and within critical care for patients whose deterioration might previously have been unrecognised should also be considered.

4 Sensitivity analysis

- 4.1.1 We would normally consider possible minimum and maximum values of variables and assumptions used in the cost model. As described above, it has not been possible in this instance to estimate a national cost, so we have not undertaken any sensitivity analysis.

5 Impact of guidance for commissioners

- 5.1.1 The impact of this guidance for commissioners is difficult to assess, because of the many and varied effects that could arise. It is unlikely to result in a reduction in hospital admissions, because the initial reason for admission is not addressed by this guideline.

- 5.1.2 The potential for reduced transfers to critical care and reduced length of stay within critical care could impact on local agreements for critical care services. There is unlikely to be any reduction in direct admissions to critical care. This is outside the Payment by Results tariff, so will be subject to local negotiation and influenced by the local baseline.
- 5.1.3 The changes could affect various programme budget categories, because categories are determined by diagnosis and this guideline includes all inpatients in acute settings.

6 Conclusion

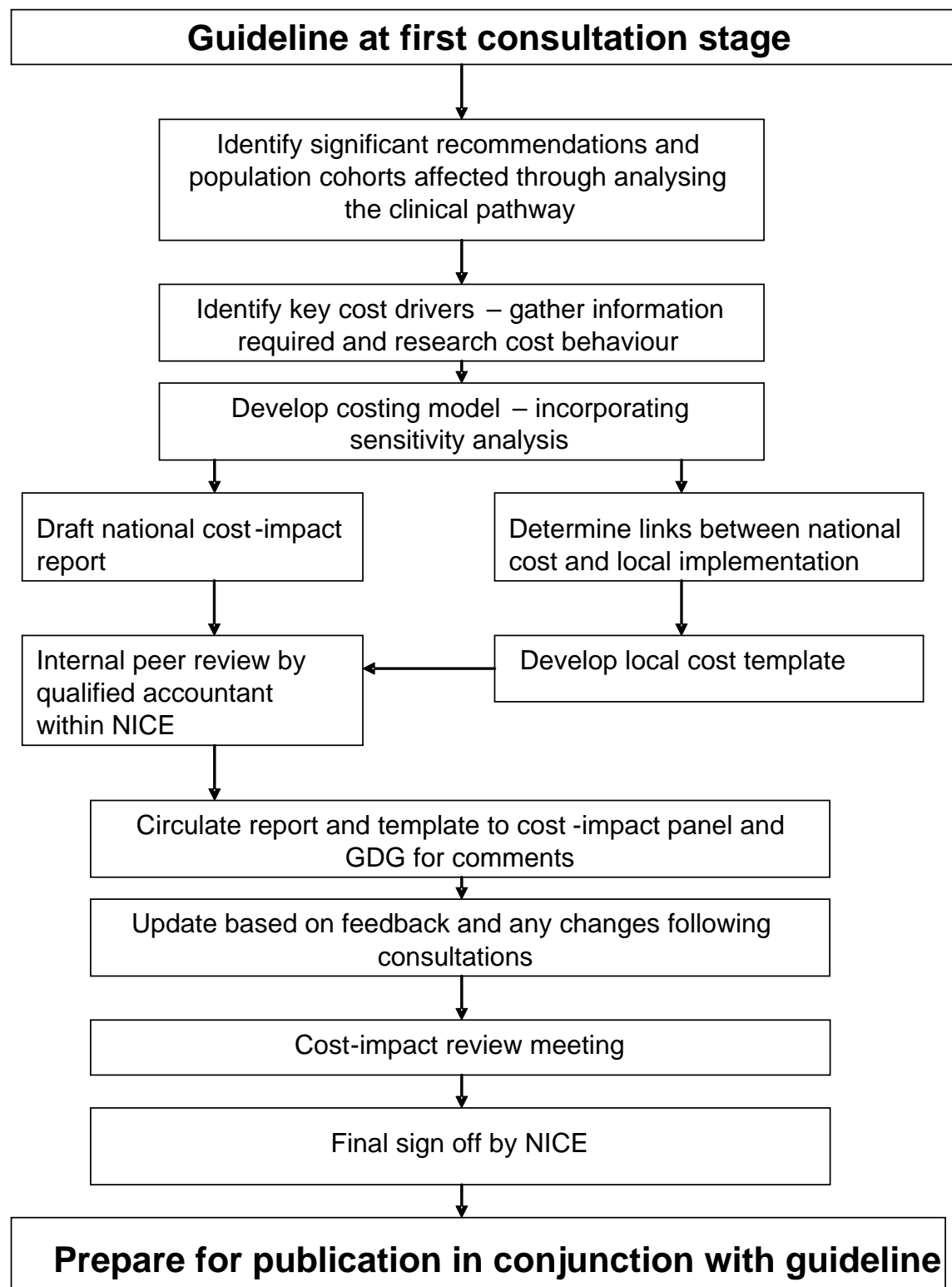
6.1 *Total national cost for England*

- 6.1.1 We have highlighted the issues that the clinicians we discussed this with and the GDG consider may have a financial impact.
- 6.1.2 We were not able to estimate a national cost arising from implementation because of the lack of baseline data regarding observations taken in different hospitals, the potential for various interrelated consequences of implementation on bed capacity and the potential changes needed to training.
- 6.1.3 We estimate that there may be an opportunity cost of £3 million in order to improve observation taking. However, this cost may be borne disproportionately across the NHS depending on local circumstances.
- 6.1.4 The recognition and appropriate management of patients at risk of becoming acutely unwell could lead to improvements in length of stay on both general and critical care wards. An ageing population and increasing demands on the service may mean that savings achieved through better management will not reduce the overall cost, but could reduce the additional investment required.

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. Use this template to help calculate the cost of implementing this guidance in your area.

Appendix A. Approach to costing guidelines



Appendix B. References

NCEPOD (2005) An acute problem? A report of the National Confidential Enquiry into Patient Outcome and Death (NCEPOD). London: NCEPOD.

Harrison D, Gao H, Grieve R et al. An evaluation of outreach services in critical care: A matched cohort analysis of the impact of outreach services, at the patient level, as characterised by the case mix, outcome and activity of patients admitted to/discharged from critical care unit participating in the Case Mix Programme. (NHS Service Delivery and Organisation (SDO) Research and Development Programme Funded Research Project (SDO/74/2004) – Sub-study 7). [Unpublished].