

Executive summary and recommendations

Overview

1 Medical equipment includes all medical devices connected to patients as part of their treatment and care in hospital, and medical devices used for diagnostic and laboratory purposes. Medical equipment therefore represents a substantial asset for the NHS that needs to be managed efficiently. Moreover, the way in which medical equipment is purchased, managed and used can influence the quality of care delivered to patients. Medical equipment can also involve risks to both patients and staff, particularly if used improperly, although the risks are small compared with the number of medical procedures carried out.

2 This report considers the strategic management of medical equipment in NHS acute trusts in England, its acquisition and use, how it is maintained, and how safe it is in use. The report examines the performance of trusts in managing medical equipment against good practice guidelines, particularly those promulgated by the Medical Devices Agency (MDA), highlighting the examples of good local practice we found.

3 The report concludes that, although there are examples of good practice, overall more needs to be done by trusts to allocate clear responsibility for medical equipment at board level. Trusts need to ensure that inventory information is comprehensive and used fully in decision making. Procurement of medical equipment needs to be better co-ordinated across trusts, with more involvement of technical personnel. They can also usefully contribute to non-clinical aspects of user training. We also recommend action that should help to improve the standards of reporting of adverse safety incidents, and to reduce their occurrence.

4 The report recommends that the NHS Executive and NHS trusts should investigate unexplained variations in the value of medical equipment holdings to see whether some trusts are under-provided with medical equipment compared to similar trusts. There may be good reasons why some trusts appear to have higher than expected amounts of medical equipment and maintenance costs, and we cannot make estimates of what economies will be possible following further investigation. We cannot therefore make an estimate of what savings can be achieved, but there is scope for investigating holdings of medical equipment to see whether economies of up to a maximum of £400 million are possible.

Medical equipment in NHS acute trusts

5 NHS trusts hold a vast array of medical equipment, ranging from less expensive items, such as stethoscopes and blood pressure gauges, to complex and costly medical equipment such as magnetic resonance imaging scanners, which typically cost £1 million and involve substantial ongoing revenue costs.

6 In total, in 1996-97, we estimate that NHS acute trusts in England held medical equipment with a replacement value of some £3 billion. They spent some £220 million on acquiring new and replacement medical equipment, and a further £120 million on maintenance. The value of medical equipment held and the scale of expenditure remained at a similar level in 1997-98. Although not specifically addressed in this report, charitable donations also contribute funding, particularly for medical equipment related to high profile conditions and services, such as coronary care, cancer and children's services.

Main findings on the strategic management of medical equipment

7 In January 1998 the MDA introduced revised guidance on the management of medical devices, including medical equipment. The revised guidance was less prescriptive than the previous guidance and its scope extended to medical devices used in the community. However, neither this guidance nor its predecessor set out the broader principles of good practice underlying the proper governance of medical equipment, including the role of trust boards. While the current guidance contains some examples of good practice, these could usefully be supplemented, particularly with regard to medical equipment organisation and management arrangements.

8 Clear leadership at board level is desirable if a trust's medical equipment is to be managed in a strategic manner. There were differences in the way responsibilities for medical equipment matters were allocated at trust board level, and at 12 per cent of trusts there was no clear lead at board level. In these circumstances it is difficult for trusts to be confident, and to demonstrate, that they are taking an acceptable approach to the strategic management of what is a substantial asset.

9 The MDA guidelines recommend that the manager of technical servicing (technical supervisor) should be involved in the purchase, acceptance testing, installation, and repair and maintenance of medical equipment, and the training

of users. However, a substantial number of technical supervisors did not include the procurement of medical equipment or the training of users as one of their main responsibilities.

10 The MDA guidelines also recommend that there should be a person in each hospital department nominated to represent all aspects of the use of medical equipment, but only a quarter of trusts had departmental user representatives in all hospital departments. The lack of user representation at departmental level can result in poor co-ordination between departments over the use and sharing of medical equipment, and between user departments and the technical department, for example over maintenance needs and scheduling. It may also impact on safety in the event that the MDA issues a Hazard or Safety Notice, as there is an increased risk that it takes longer to locate and identify specific medical equipment.

11 One in three trusts did not have an equipment procurement committee as recommended by the MDA. Furthermore, 60 per cent of the committees that did exist did not have responsibility for the procurement of all medical equipment, although in each case the proportion of a trust's expenditure on medical equipment not covered was unclear. In these circumstances the scope for effective strategic planning, co-ordination and procurement of medical equipment is limited, thereby risking value for money.

12 Good quality information is a prerequisite for effective management of medical equipment. At some of the trusts we visited medical equipment inventories were either out of date, inconsistent with other records, or lacking important detail. Poor inventory management and information can constrain a trust's ability to make rational long term planning decisions on the basis of the existing stock of medical equipment. It may also limit the efficient utilisation of medical equipment and effective planning of maintenance, and there may be safety implications if medical equipment cannot be located promptly via an inventory.

Main findings on the acquisition and use of medical equipment

13 A properly planned approach to the acquisition of medical equipment, taking into account the needs and preferences of professionals and end-users whilst retaining consistency and control, is needed if value for money is to be obtained. Some trusts demonstrated good practice by, for example, involving technical personnel in the acquisition process and using lifecycle costing to inform acquisition decisions. However, not all trusts we visited had a formal business planning process in place for the acquisition of medical equipment, and while business cases were often prepared they were of variable quality. The variable

quality of business cases applied equally to the acquisition of more costly medical equipment, such as magnetic resonance imaging (MRI) scanners, which can each cost up to £1 million in capital costs alone and can have a strategic impact beyond the boundaries of the purchasing trust.

14 Trusts made good use of available information in selecting medical equipment for purchase, including information on products provided by manufacturers or suppliers, and from the MDA and NHS Supplies. Some medical equipment suppliers told us, however, that they considered NHS medical equipment procurement procedures to be inconsistent between trusts and overly complex, resulting ultimately in higher prices being charged to their NHS customers.

15 On average, in 1996-97 trusts completed 40 per cent of medical equipment purchases in the last quarter of the year. And a fifth of trusts spent more than 50 per cent of their medical equipment budget in the final quarter. This pattern of spending, which was repeated in 1997-98, might reflect prudent financial management by some trusts, but where it is not planned there is a risk that trusts spend at the year end to use up their budgets, without due regard to value for money and longer term strategic priorities.

16 Clinical requirements will dictate that a minimum number of makes and models of the same item of medical equipment is needed in a hospital. But, where appropriate, standardisation of medical equipment can save costs on acquisition and maintenance, improve flexibility in the use of medical equipment for patient care, and reduce some of the potential for serious incidents. Standardisation of medical equipment by type, in conjunction with the operation of medical equipment libraries, can also lead to more efficient utilisation of medical equipment.

17 For selected items of equipment, we found a wide range in the number of makes and models held by different trusts. Standardisation to a limited number of makes and models of medical equipment can produce substantial savings and we found examples of where this had been achieved, but only a small minority of trusts had a documented policy on the standardisation of medical equipment.

18 The size of a trust and the nature of services provided are important determinants of the amount of medical equipment held, but allowance for these and a range of other factors explained only three quarters of the variation in medical equipment holdings across trusts in 1996-97. Some trusts had less equipment than expected, and this may reflect either efficiency in use, or under-provision in comparison to similar trusts. Some trusts are highly specialised

and require more, or more expensive, medical equipment. In some cases, equipment may be fully depreciated and kept in reserve, overstating the unexplained level of medical equipment. We cannot therefore make an estimate of what savings can be achieved, but there is scope for investigating holdings of medical equipment to see whether economies of up to a maximum of £400 million are possible.

Main findings on medical equipment maintenance

19 Most medical equipment maintenance is carried out by suppliers or by third parties, who together accounted for about two-thirds of total maintenance costs across all acute NHS trusts in England in 1996-97 and in 1997-98. Trusts vary in the relative amount of maintenance carried out in-house and externally. Although there can be advantages from contracting with external suppliers of maintenance, particularly for more complex items of medical equipment, we found that some trusts had reduced their overall maintenance costs through the increased use of in-house maintenance. However, in each case the balance of provision needs to be weighed carefully to make sure that any change offers value for money. Some trusts had also produced savings through the rationalisation and improved monitoring of external maintenance contracts.

20 Almost all trusts have adopted planned preventative maintenance, taking into account manufacturers' recommendations on maintenance frequencies, in line with MDA guidance. Some trusts strictly follow maintenance schedules set by medical equipment suppliers. Others have developed their own schedules in the light of operating experience, to save costs without jeopardising safety. Trusts, however, need to take account of the potential increased exposure to liability should they vary maintenance schedules from those recommended by medical equipment manufacturers.

21 Total maintenance costs in 1996-97 varied widely across trusts. Allowance for the value of medical equipment held and a range of other factors explained nearly 80 per cent of the variation. Trust specific factors may well account for some of the remaining variation, and further investigation by trusts is needed. We cannot make an estimate of the savings that can be achieved, but the potential is for savings up to a maximum of £18 million a year.

22 Maintenance cover arranged through insurance companies is becoming increasingly popular. On the basis of international experience that we reviewed, we caution that this route may not offer savings in the long term, and in each case the benefits of maintenance insurance need to be assessed carefully.

23 Thirty per cent of in-house maintenance departments had external accreditation to a recognised quality standard. Apart from the greater assurance accreditation gives to medical equipment users, based on examples of best practice we saw it leads to higher quality of work and the scope for efficiency savings.

Main findings on medical equipment safety

24 More than 2,000 adverse safety incidents involving medical devices, including medical equipment, were reported to the MDA by NHS trusts in England in 1997-98. Although the number of adverse incidents is low in relation to the total number of procedures carried out in NHS trusts, there has been an upward trend in incidents reported since 1993-94. The MDA believes this is due, at least in part, to improved reporting by trusts and the introduction of mandatory reporting of some types of incidents by manufacturers. Over the three financial years 1995-6 to 1997-8, nine deaths and 55 serious injuries have been directly related to medical devices, including medical equipment, or their misuse.

25 We found a wide range in the number and proportion of adverse incidents involving medical equipment reported by NHS trusts to the MDA under its voluntary reporting scheme. The variations suggest that the safety record of some trusts may be worse than in others. Also, or alternatively, some trusts may have a poorer record than others in reporting incidents.

26 We found in some trusts visited examples of good practice in reporting adverse incidents and in disseminating safety information issued by the MDA. However, other trusts had ineffective systems for reporting adverse incidents or ensuring that an adverse incident involving an individual item of medical equipment would not be repeated.

27 While trusts find MDA Hazard and Safety Notices useful, some were unable to act on them effectively, particularly where their inventories are incomplete or out of date.

28 It is essential that all users of medical equipment are properly trained. User error is a frequent cause of adverse incidents, and good quality training is probably the most important factor in reducing the level of user error. Medical engineering departments are well placed to play a more active role, than they do at present in some trusts, in the non-clinical aspects of training in medical equipment use.

Recommendation 1: Improving strategic management of medical equipment

29 We found examples of good practice that could be adopted more widely. Strategic management could be improved by implementation of the following recommendations:

- The MDA guidance to trusts should be supplemented to address some higher level strategic issues, including the role of trust boards, and good practice in the management of medical equipment;
- trusts should ensure that there is clear and effective oversight at board level of all aspects of medical equipment, and consider whether this responsibility might be exercised more effectively by vesting it in a single director;
- all trusts should establish procurement committees, with medical engineering and finance department representation, and ensure that medical equipment user representatives are established in all hospital departments;
- trusts should review their inventory management arrangements against the principles of good practice set out in MDA guidance, and look at the potential for modern information systems to facilitate consolidation into a single inventory where practicable.

Recommendation 2: Improving value for money from the acquisition and use of medical equipment

30 In the light of our findings, we recommend that trusts should:

- review their business planning arrangements for medical equipment, in particular the quality of business cases developed for the acquisition of more expensive items of medical equipment;
- review their medical equipment procurement procedures to ensure they are based on full life costing, are only as complex as is needed to ensure value for money, and encourage a consistent approach. The NHS

Executive should provide a lead by identifying and promulgating good procurement practice taking account of the outcome of the 1998 Cabinet Office review of NHS procurement;

- seek to reduce the number of different models of each type of medical equipment in use and, accordingly, introduce a replacement strategy that promotes standardisation of medical equipment, to save money and minimise the staff training burden while ensuring that all clinical needs are covered. Benchmarking between trusts has an important role to play in facilitating this work;
- examine whether the pattern of expenditure over the financial year in procuring medical equipment is conducive to ensuring good value for money;
- benchmark their holdings of medical equipment against those of similar trusts to examine how cost effective they are and identify good practice.

Recommendation 3: Increasing the value for money obtained from maintenance

31 We found many good examples of innovation, cost saving and quality of work improvements in connection with medical equipment maintenance. To learn from this, and taking account of our other findings, we recommend that trusts should:

- examine whether they can reduce maintenance costs through sharing maintenance with external suppliers, or by taking over some work altogether;
- review external contracts, to seek cost savings through better contract co-ordination and monitoring of their need. When considering insurance based maintenance, trusts should assure themselves that long term savings are possible;
- develop and review planned preventative maintenance schedules, in the light of experience and manufacturers' recommendations on maintenance frequencies, and sharing information and experience with other trusts, with a view to saving costs without reducing medical equipment safety or increasing exposure to liability;

- benchmark their maintenance costs against those of other trusts, in order to introduce best practice and explore the potential for financial savings;
- evaluate the benefits of, and where appropriate take steps to obtain, external accreditation of their in-house maintenance departments.

Recommendation 4: Improving safety of medical equipment

32 The upward trend in the number of medical equipment safety incidents reported may stem in part from more reliable reporting by trusts, and we welcome the MDA's work to improve the standards of reporting. We recommend that:

- the MDA and the NHS Executive should investigate variations in the levels and proportions of incidents reported, and consider whether the voluntary system that requires trusts to report incidents, when taken together with other reporting systems, leads to a sufficiently comprehensive knowledge of medical equipment safety risks in NHS trusts;
- trusts should have effective systems and fully documented procedures for recording and reporting medical equipment safety incidents, and ensuring that adverse incidents occurring within a trust are not repeated;
- the MDA and the NHS Executive should consider how best practice related to safety of medical equipment generally can be monitored, disseminated and put into effect in order to reduce the overall level of adverse incidents;
- trusts should consider how to make best use of medical engineering department and other expertise in user training.

Overall conclusions

33 Our examination has identified many examples of good practice in the management of medical equipment, from strategic overview, to day to day activities such as maintenance, and in the field of medical equipment safety.

34 There is considerable variation between trusts, however, in terms of practices adopted, and also in the amount of medical equipment held in relation to size of trust and other factors, and also in respect of maintenance expenditure. In

many instances we believe there may be potential for financial savings and we have attempted to quantify this. We believe that the benchmarking of costs and management practices, as used by many public and private sector organisations, could yield the benefits of lower costs, quality improvements and reduced safety risks.

35 The Accounts Commission for Scotland have adapted some of our methodology to review the management of medical equipment by trusts in Scotland. And we have discussed with the Audit Commission the scope for them to undertake local audits of NHS trusts in England and Wales, drawing on our findings, in order to help realise these benefits.