King's Fund

Better Beds for Health Care

Report of the King's Fund Centenary Bed Project

John Mitchell
Judith Jones
Bardy McNair
John McClenahan

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Foreword

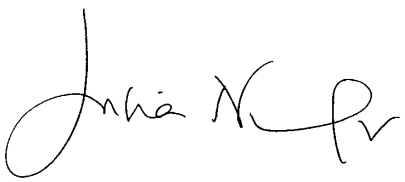
I am delighted to commend this report and its accompanying guides. This is an important piece of work for several reasons.

Beds, like other types of health care equipment, can have a profound impact on the lives and work of their users. Ultimately, health care depends on the skills, efforts, motivation and powers of recovery of patients, staff and the many informal carers as well.

Together, they are health care's most precious asset. It is vital to ensure that they can each do what they have to do effectively, easily, safely, comfortably and independently. Only good, well chosen beds can ensure this. The wrong bed will waste scarce human resources and put them at risk.

The 'King's Fund Bed' which we developed thirty years ago was intended to meet the needs of users in acute hospital wards. As well as having its roots in our earlier work, the 'Centenary Bed Project' also suggests new partnerships and innovations which are needed to reflect our rapidly changing patterns of health care. Then, it was possible for a 'one-off' study to remain influential for many years. This is not the case today. New partnerships and methods of improving and innovating beds and other types of health care equipment must be developed to respond to current needs.

The challenge now is for the stakeholders to come together in a new forum for innovation to sustain and develop this partnership among all those with an interest in better beds for health care. This should ultimately lead to beds which enhance the quality of life of all those who use them.



Rabbi Julia Neuberger
Chief Executive
King's Fund

Executive summary

Good quality beds are essential for health care

People are health care's most valuable asset. Bed users include:

- *occupants* (the people who are in the beds)
- informal *carers*
- health care *staff* and *organisations* providing health and related services.

Each must be able to carry out their work and functions effectively, safely, easily, comfortably and as independently as possible.

This can only be achieved if their beds and related equipment have been designed to take full account of their needs and circumstances.

Better beds can make an important difference

The advantages from better designed and chosen beds can include:

- Faster and/or better recovery from illness
- increased independence, and greater ability to cope with chronic illness or disability
- reduced demand upon social support services
- increased productivity from health services
- reduced personal and organisational costs of accidents, absenteeism, litigation and insurance premiums.

A wide range of organisations have a stakeholder interest in better beds

Many interests would be served if human resources could be used more effectively through developing and using better beds. They include occupants and their carers, tax-payers, health providers, support services, bed manufacturers and suppliers.

There are also a number of statutory, commercial and voluntary organisations which supply beds or information about beds. They include local and central providers and commissioners of health and social support services, NHS Supplies, equipment loans stores, the British Surgical Trades Association, Disabled Living Centres (DLCs), the Disabled Living Foundation, the Disability Information Trust, manufacturers and retailers, and a wide range of disability organisations, charities and user groups.

Need for partnership: a forum for innovation

There is no established forum where stakeholders can work together to improve the quality of health care beds. Our discussions have revealed widespread recognition of the need for such a forum and support for its establishment.

Need for appropriate methods and systems

Systematic methods are needed to ensure that beds are chosen, used, evaluated and innovated effectively. Present systems rely on 'one-off' initiatives which do not take full account of stakeholder needs.

The King's Fund guides to choosing health care beds are intended to underpin the choice, use and evaluation of beds. More extensive methods are however needed to ensure that user problems are routinely identified and resolved through a systematic process of information exchange supporting innovation.

Information links between stakeholders

Reliable and effective information is needed when beds are being chosen, used, evaluated and innovated. For example, those choosing beds need a thorough understanding of their users' needs as well as reliable, up-to-date information on available beds and how well they perform. Users need to know how they can evaluate their beds and how they can make their feedback count. Innovators need to know how well their products meet their users needs and how they compare with competitors' models.

Present information links cannot satisfy these needs.

Estimating the 'lifetime' costs of beds

Though poor quality or badly chosen beds can impose heavy penalties on occupants, staff, informal carers and providers it is nevertheless very difficult for them to work out what these costs may be or how to choose beds that will allow their resources to be used more effectively. Though it is easy to identify the capital costs of beds, it is much harder to estimate the benefits and costs over the lifetime of the beds.

Applications of information technology

Bed occupants, staff and informal carers, service providers, and suppliers between them could have an unrivalled combination of expertise on their needs and problems. Unfortunately, they often work in isolation and have few opportunities to contact and learn from one another. Information technology appropriately harnessed on behalf of the forum suggested above could provide the framework and methods to enable this resource to be developed and used.

Need for adequate resources

Since bed purchasing strategies are largely geared to low cost, 'standard' King's Fund beds, current investment in health care beds is low. More highly specified, often powered, beds are achieving a relatively low take-up and application within health care in the UK.

Summary of recommendations

Recommendations from each chapter are summarised below.

Chapter 4. A better process for choosing beds

For those choosing beds for hospitals

We recommend that NHSE, commissioning organisations, supplies departments and senior hospital management encourage those choosing beds for hospitals to:

- use a systematic and participative process of choice
- consider the costs of beds over their lifetime, not just initial capital costs, so far as practicable
- provide feedback on the effectiveness of beds in use.

For those choosing beds for residential and nursing homes

We recommend that:

- better access be established to existing sources of information such as Disabled Living Centres (DLCs), or that new sources be set up through professional and trade organisations, or statutory inspection agencies
- homes review their practice of encouraging new residents to supply their own beds. Where this is considered necessary, sound advice must be given to residents or their relatives about what is suitable, bearing in mind particularly the danger to staff of low fixed-height beds.

For equipment loans stores

We commend existing collaborative approaches between loans stores, and would like to see them encouraged and adopted more widely.

For domestic buyers

We suggest that wider publicity be given to the role of DLCs, the Disabled Living Foundation, occupational therapists, and other sources of information services and advice.

All types of users

We recommend that:

- use be made of the relevant King's Fund guides to choosing health care beds published in parallel with this report
- manufacturers' information be presented in a more consistent format – at least about types, qualities, and dimensions of beds. Independent input may be necessary.

Comparative information on the functions and quality of different beds should be developed and made available to all stakeholders

Chapter 5. Key areas: occupant independence, pressure sores and back injury

Health care beds should be appropriately specified and designed to meet occupants' needs for independence, comfort and safety, as well as carers' and staff needs.

In most health care situations where occupants are confined to bed for a substantial part of the time, where they require more than a minimum of nursing care, or where their mobility is significantly compromised, powered variable-height profiling beds* should be considered the provision of choice.

Suitable mattresses with adequate pressure-relieving properties should be provided for all occupants of health care beds.

Chapter 6. What kind of beds are needed in nursing homes?

Variable-height beds should be routinely available and preferably standard in nursing homes.

Profiling beds, or at least powered rising backrests, should be provided for all residents with limited mobility (and preferably for all residents).

Homes should take advantage of the availability of beds which have variable height and profiling yet have the appearance of domestic beds.

Beds must allow sufficient clearance underneath for a hoist.

Chapter 7. What kind of beds are needed in occupants' own homes?

Variable-height beds should be considered by, or on behalf of, anyone with severely impaired mobility or in need of nursing care.

Profiling beds, or at least rising backrests, are desirable for many.

Beds should allow sufficient clearance underneath for a hoist.

Loans stores need adequate funding to be able to supply and maintain appropriate beds. Beds for loan should be easy and safe to transport and assemble.

Chapter 8. Is the powered variable-height profiling bed the answer?

On balance, powered variable-height profiling beds are the ideal for most circumstances.

Such beds are not considered usual in the current health care climate. With the introduction of such beds there will be a need for staff to receive training in how to make the most effective use of them.

Occupants need assessment to determine which facilities they need, and how they should be used.

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* Profiling beds (domestic and hospital) have a mattress platform split into three, four or five sections, which may be angled for comfort and convenience.

Chapter 9. The role of mattresses

The 'DHSS' (marbled cover) mattress should be phased out of use everywhere and replaced with a mattress with better pressure-relieving properties and a 'breathable' cover. (The new, 1998 NHS contract mattress fulfils this requirement.)

Mattresses in all health care facilities should be regularly turned and inspected, and replaced before they become hazardous to occupants.

For domestic beds there should be a universal rating system for firmness.

Impartial advice should be made available for those purchasing mattresses for domestic use, and realistic trialling of mattresses should be possible.

Chapter 10. Improving the standards

The next time British or European standards for health care beds are being revised, the suggestions in this chapter should be considered for incorporation.

Manufacturers should consider improving their designs in response to the user feedback reported here and to the other recommendations in this chapter.

Those currently choosing beds in hospitals may wish to consider some of the information in this chapter when making their selection.

Chapter 11. Making continuous improvement possible

We believe that present arrangements for choosing, using, and developing health care beds and associated equipment need substantial, sustainable improvement. Several principles should underpin that improvement:

- systematic design and routine processes for continuous innovation will work even better in the medium to long term than intermittent 'one-off' interventions, however well done
- proposals which improve the operation of the 'marketplace' are preferable to centrally mandated solutions
- improvements to the marketplace should operate in the best interests of users of the products and services concerned.

A forum to promote and sustain this improvement as recommended in the next chapter should be considered.

Chapter 12. A forum for continuing partnership and collaboration

A forum should be established which would encourage effective commissioning of beds and related equipment for health care. It would provide a continuing presence, aiming initially to:

- identify financial and human resources for the work
- identify further what information is already available, what information is needed by the various stakeholder groups and thence where the gaps are
- develop a strategy for meeting those information needs, including:

Research: e.g. commissioning research on the 'lifetime' (not just capital) costs of beds/equipment in use; and evaluation studies of items of equipment

Development: e.g. developing an interactive database for user feedback; other methods for systematically collating feedback on equipment; encouraging resolution of design problems; and making available such feedback to help those purchasing equipment

Publicity: e.g. ensuring that all stakeholders are informed about the value of effective purchasing; ensuring that information about user needs is available to all who need it.

WHERE WE ARE NOW

PART 1

The context – and why bed choice matters

Chapter 1

How we got here

The original King's Fund Bed specification

The original King's Fund Bed specification, developed in the 1960s, revolutionised hospital bed design. It did this by linking bed users with innovators in bed specification and design, and developing a specification for *what* performance the bed should provide, not *how* it should be done. 'Users' were then considered to be staff in acute hospitals providing general medical and surgical services. 'King's Fund Beds' based on this specification are now so familiar in hospitals that they are for the most part taken for granted, and have affirmed the long-range vision of their developers.

Their use led to dramatically improved working conditions for ward staff, and played an important part in the design and redevelopment of acute hospitals in that period in Britain.

British and European safety and performance standards for health care beds[1,2] are still largely based on the original King's Fund performance specification.[3]

The time warp

In Britain, these beds were in a sense *so successful* that after the original King's Fund project finished, there was no longer seen to be a need to keep in place a continuing structure for updating the specification. There was no easy way of obtaining regular feedback on users' experience of the new beds. It was not clearly any organisation's continuing responsibility to see whether needs had changed significantly, and with rare exceptions manufacturers were not in a position to do it themselves.

Problems experienced by occupants (the people who are in the beds) and informal carers, for example, were not always noticed or put right. Bed development in the UK slowed down relative to other countries. Since the initial replacement of old beds with the newer King's Fund specification beds in British hospitals, there has been little generally perceived need to renew the bed stock with more up-to-date designs.

Centenary Bed project

The King's Fund felt it appropriate to commemorate their centenary year by revisiting one of their best known previous projects, the King's Fund Bed specification. The King's Fund wanted to look again, and more broadly, at the **role of beds in health care** (*not* just their use in hospitals, which had been the focus of the previous work). In the 1990s the potential for change in bed specification, design, and use, is less dramatic, but still of potentially great importance.

Under the guidance of a steering group (membership given in Appendix A) the King's Fund established a project team which worked from late 1996 to early 1998.

In this project, the team consulted widely with occupants, staff, informal carers, and a range of experts including manufacturers and suppliers. Details of the consultation process are given in Appendix B and a list of those consulted is shown in Appendices C and D.

The changing context for health care beds

Health care bed needs are now more complex

As health care has become more complex and more specialised, a single design specification can no longer meet such a large proportion of the spectrum of needs. Changes in clinical practice and public expectations mean that more health care is now delivered by professionals working outside hospitals – in nursing and residential homes, other community settings, and domestic homes. Decision making is more decentralised, so more people need access to information about beds.

Markets are now international

The design and marketing of health care beds has become international – national markets are no longer large enough to support major suppliers' R&D investment and marketing.

Service user needs now have greater weight

The views of users of health services are now given increasing recognition, whereas the original specification gave greatest weight to views of paid staff in institutions and community services, in an era when 'patients' were often seen as people for or to whom things were done by others.

Relevant information is scattered and hard to collate

We have attempted to pull together the information about what matters to the wide range of organisations and individuals involved in supplying, choosing, and using health care beds – and found it difficult.

There is no systematic process for feeding back information from users' experience of what they need from their beds to improve health care organisations' understanding of their needs. Purchasers of health care beds find it hard to access user views, to refine general performance specifications, and find suppliers' designs to meet them. To their credit, some manufacturers have attempted this, but the 'marketplace' as a whole has not been very responsive in identifying needs and matching them to available designs, or developing improved ones based upon systematic assessment of user needs from a broadly based perspective.

Guides to bed selection should help practitioners in the field

In contrast to the position facing the 1960s King's Fund Bed team – a radical rethink of the role and specification of the hospital bed – we feel that the issues about health care beds have now changed. They are more about making sure that users' needs are identified clearly, over a wider range of uses inside and outside hospitals, and finding ways to use

that information to improve choices from a wide range of available products, or providing signals to the marketplace to generate new options.

Published in parallel with this report is a series of guides to choosing health care beds for hospitals, for nursing and residential homes and for use at home.[4,5,6] These are referred to throughout this report as the *Guides*.

Policy changes are needed to support widespread improvement

Initial feedback from potential users of the draft *Guides* has been very encouraging. However, they believe that to make a substantial impact on health care delivery, these guides are not enough.

UK policy makers and regulators at national and local levels need to set clearer incentives and provide encouragement to invest in better beds and related equipment if the potential benefits are to be widely realised. There may even be benefit in looking beyond the UK, but the organisational framework to do this will need further investigation and development.

This report outlines our main findings and principal suggestions for improvement which the King's Fund hopes can be made.

Access to further information

For further information about the project, see the King's Fund web site *www.kingsfund.org.uk*. Comments or correspondence may be sent by e-mail to *kfbed@kingsfund.org.uk*.

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1. British Standards Institution, *British Standard Specification for Hospital Bedsteads (BS 4886: 1988)*
2. IEC 601-2-38: Medical electrical equipment – Part 2: Particular requirements for the safety of electrically operated hospital beds [Draft]
3. King's Fund, *Design of Hospital Bedsteads*, London: King Edward's Hospital Fund for London, 1967
4. Jones, JAR, McNair, B and Mitchell, JC, *Choosing beds for hospitals: a guide*, London: King's Fund, 1998
5. McNair, B, Jones, JAR, and Mitchell, JC, *Choosing beds for nursing and residential homes: a guide*, London, King's Fund, 1998
6. Mitchell, JC, McNair, B and Jones, JAR, *Choosing health care beds for use at home: a guide for users and professionals*, London, King's Fund, 1998

Chapter 2

Why choosing the right bed is important

Beds can affect occupants' and other users' health

Long-term and significant but largely hidden costs can be caused by badly designed or inappropriately chosen beds. There are three areas which seem to us to be substantial, and potentially quantifiable, but all are still hard to quantify with any accuracy:

- Loss of occupant independence
- Work-related back pain for informal carers and staff
- Prevention and treatment of pressure sores.

(See Chapter 5 for a further discussion of the significance of these issues.)

A fourth, infection control, can also be influenced by bed design and maintenance, but it is even more difficult to quantify the impact of improved design on infection rates, which are strongly influenced by hospital infection control policy and management implementation of policies.

There are many health care beds in use

There are many beds used for health care in the UK. For England alone the figures are easy to obtain in a consistent format, and total over two-thirds of a million in hospitals, nursing and residential homes – without counting those who may be confined to bed at home.

Health Care Beds in England 1995/96

Type	*Beds (000)*
Acute hospitals	108
Elderly services	34
Other hospitals (mainly mental health and learning disability)	64
Nursing homes	175
Residential homes (for adults)	308
Total	*689*

Notes: *Hospitals:* Figures refer to average available beds over the fiscal year. There were an additional 66,000 available hospital beds in total in Scotland, Wales and Northern Ireland for the corresponding period.

Residential and Nursing Homes: Figures refer to a 'snapshot' of places available in local authority operated and/or registered homes for adults in England (essentially all homes with more than four beds), as at 31 March 1995.

Sources: [1,2]

Detailed figures for Scotland, Wales and Northern Ireland are not available in a wholly consistent format. However, combined, these three countries add around a third to the

overall *hospital* bed total for England alone, and a significant proportion of non-hospital institutional beds.

For the whole UK the overall total of health care beds *not* in people's own homes is well in excess of three-quarters of a million.

The present hospital stock is no longer really suitable to present needs

Many hospital beds are old and serve modern users less well than they could

According to the British Surgical Trades Association, most acute hospital beds are to the King's Fund specification, but fewer of this specification are found in other sectors – and very few in residential homes.

Hospital beds are ageing. We know of one major teaching hospital where a bed stock survey showed that a high proportion of beds are over 15 years old, and some even pre-date the King's Fund specification. It is possible that this is not untypical of hospitals in general.

Occupant independence is not possible or is very difficult in several respects

The original specification was prepared mainly to meet the needs of *staff* who came in contact with beds, in an era when *patients* were expected to have a mainly passive role in their hospital care. The expectations of modern occupants of health care beds are very different, and place a higher importance on independence both for its own sake, and as a possible way of reducing the need for staff time to support movement within, out of, or into the bed.

Present designs based upon the King's Fund specification for the most part make it impossible for occupants to adjust the backrest or bed height while in bed. They need staff help to do this, and may need help to get in or out of bed, which often might be unnecessary if the height were adjustable by the occupant themselves.

Hospital beds are not being replaced rapidly

According to the British Surgical Trades Association, the total UK market for King's Fund specification health care beds (by far the biggest seller by volume, mostly to the hospital sector) is around £7m a year, representing just over 10,000 beds a year. List prices vary from £500–£800 per bed depending on range of features included, and discounts are offered for quantity purchase.

At this rate, the present hospital stock alone would take around 20 years to replace. Until recently, the stock was also improving through accelerated 'natural wastage', as the oldest beds could be scrapped or sold as the total number of hospital beds declined in response to clinical and policy changes in mental health, and to financial pressures as well as clinical practice changes in the acute sector. However, there is beginning to be a small upturn in available acute bed numbers, and continuing growth in the use of residential care. The rising demand for hospital care and the increase in lifespan, growing prevalence of chronic illness, and social change are beginning to outweigh the trends in increased throughput per bed, and lead to a growing overall requirement for health care beds.

Residential and nursing home beds present high risk of back pain for care staff

In such homes many beds are domestic-style divans of low fixed height. Residents are often expected to bring their own furniture with them, including a bed. Even when they do not, the economics of residential and nursing home ownership encourage the use of inexpensive divan-style beds rather than more expensive variable-height beds that would reduce the strain on staff making beds, and increasingly, having to help residents in and out of bed.

People living in the community cannot easily find satisfactory and affordable beds

Many people living at home with health care problems that could be alleviated by a better chosen bed cannot easily find one.

There are several principal reasons.

- shortage of investment in loans store equipment available via the NHS (and some other sources including Social Services and voluntary organisations)
- lack of consistent ways of describing need
- difficulty for users trying to choose beds in finding accessible and up-to-date information about what is available, what it costs, and how it might be paid for
- lack of feedback on problems in using equipment – which could be used to:
  - improve understanding of what is needed
  - see how designs could be improved to reduce common problems
  - see what new designs should be developed for unmet needs.

References

1. Government Statistical Service, *Bed availability for England: financial year 1995/6*, London: Department of Health, 1996
2. Government Statistical Service, *Key indicators of local authority social services 1996*, London: Department of Health, 1996

Chapter 3

Who it matters to

Who will gain from better beds?

Three main groups stand to benefit from better beds and health care equipment: bed users themselves, organisations providing health and related services, and commercial suppliers and manufacturers.

Bed users have a clear and obvious interest in better equipment that allows maximum independence for their occupants, and enables safe and effective care, since this allows them to get the most benefit from the time and resources available to them.

Organisations providing health and related services can also benefit from equipment that enables them to use their human resources to better effect. Better quality beds can make staff and carers more productive and make their work safer. The right beds can also improve occupant recovery and enable occupants to achieve greater independence. Service providers have a stake in finding out where their effectiveness could be enhanced by using better quality equipment.

Service planners and commissioners at regional, central and governmental levels also have a stake in seeing improvements in the quality of care provided for the populations for whom they are responsible.

Commercial suppliers and manufacturers share in the other stakeholders' interests in using their resources to best effect. In the past, initial purchase price has been the dominant element in product selection. This fails to reflect the long-term costs of lost productivity, occupant, staff and carer injury, and poor use of resources.

Key questions for quality and effective choice

Four key questions can reveal if beds are of good quality and have been appropriately chosen:

1. Who will use the beds?
2. What will they use them for?
3. Where will they use them?
4. Can their users carry out their required functions: effectively? easily? safely? independently? comfortably?

Failure to answer these questions well will impede the quality of the functional support that beds provide for their occupants and other users.

Some occupants or other users will need very high quality conditions to enable them to function at all. For example, occupants who are weak or in pain cannot sit themselves up to see and hear what is going on around them, without help from another person – or from a powered, adjustable bed.

Other users may be able to use their own capacities to make up for the shortcomings of their beds by working harder, longer or more carefully. However, in the longer term and across health care generally, this has two overriding disadvantages:

- effort that ought to go into providing high quality health care is used instead to 'prop up' inappropriate equipment.
- the lack of a feedback mechanism conceals the inadequacies of the equipment instead of bringing them out into the open where they can be tackled: by better methods of choosing beds, by design improvements, or by new product development.

Remaining parts of the report

The next two parts of this report summarise the findings from our consultation with a wide range of stakeholders (for further information, see Appendices B, C, and D). Part 2 focuses on how the *process* of choosing beds could be improved, and our recommendations derived from their feedback; and Part 3 describes why we believe it is worth aiming for a higher *quality* of beds to be used for health care. It is followed in Part 4 by suggestions for how the process we have initiated might be continued and sustained in the future.

WHAT WOULD MAKE A DIFFERENCE?

Findings from our consultation, and recommendations

PART 2

A better process for choosing beds

Chapter 4

How the process could be improved

Recommendations

For those choosing beds for hospitals

We recommend that NHSE, commissioning organisations, supplies departments and senior hospital management encourage those choosing beds for hospitals to:

- use a systematic and participative process of choice
- consider the costs of beds over their lifetime, not just initial capital costs, so far as practicable
- provide feedback on the effectiveness of beds in use.

For those choosing beds for residential and nursing homes

We recommend that:

- better access be established to existing sources of information such as Disabled Living Centres (DLCs), or that new sources be set up through professional and trade organisations, or statutory inspection agencies
- homes review their practice of encouraging new residents to supply their own beds. Where this is considered necessary, sound advice must be given to residents or their relatives about what is suitable, bearing in mind particularly the danger to staff of low fixed-height beds.

For equipment loans stores

We commend existing collaborative approaches among loans stores, and would like to see them encouraged and adopted more widely.

For domestic buyers

We suggest that wider publicity be given to the role of DLCs, the Disabled Living Foundation, occupational therapists, and other sources of information services and advice.

For all types of users

We recommend that:

- use be made of the relevant *Guide*.[1, 2, 3]
- manufacturers' information be presented in a more consistent format – at least about types, qualities, and dimensions of beds. Independent input may be necessary.

Comparative information on the functions and quality of different beds should be developed and made available to all stakeholders.

For hospitals

In hospitals new beds are commonly chosen through collaboration between senior nurses and supply departments, usually with the assistance of specialists, such as clinical nurse specialists in tissue viability and manual handling advisers.

Information is obtained from manufacturers, from trade exhibitions, from nursing and supplies journals and by networking with colleagues. Where occupational therapists are involved in the decision, information may also be sought from DLCs and from the relevant section of the *Hamilton Index*.[4] Some of those we consulted who had expert knowledge felt that information use was poor, telling us that often acquisitions were made from known suppliers rather than staff exploring more widely. There was a view that clinical staff were not used to drawing up a specification and then looking for equipment to meet it, but tended simply to choose an item from a brochure, or choose from a familiar manufacturer. One of the problems was that manufacturer's information is not presented in a standard format, which makes it very difficult to make valid comparisons. This could be easily rectified by requiring manufacturers to produce a standard data sheet.

Some purchasers were concerned at the usefulness of available information. They saw manufacturers' literature as being biased towards their own products and felt there was a lack of any information on the quality of equipment on offer. They pointed to the need for *'Which?'*-type comparative information. (The Medical Devices Agency does such comparative reports, but has not tested beds.)

For those undertaking major bed replacement programmes, the main issues in selection were the choice between buying or leasing beds, and choosing between a 'universal' bed and a selection of beds to meet specific needs. Buying all from one manufacturer was thought to offer cost savings as well as an assurance of compatibility of attachments (which can otherwise be a major problem), but possibly at the cost of not meeting specific needs since a single manufacturer may not be able to provide a range of beds to meet all the specifications required.

For those replacing beds on a smaller scale, some found that since the devolution of budgets to directorates, the staff responsible for the purchase may have limited experience of making such choices and may have limited access to the necessary information. Where beds are moved around a hospital, there may also be some reluctance to purchase new beds as they could be moved away to the benefit of another directorate.

For nursing and residential homes

Nursing and residential homes, given their very diverse client groups, made use of a wide variety of information sources. Nursing homes tended to use information from advertisements and manufacturers' literature and company representatives; some purchased ex-hospital (King's Fund) beds. One home we visited for disabled people consulted widely, including professionals such as occupational therapists, DLCs and societies such as the Motor Neurone Disease Association. The same home had a rigorous process of inviting as many local experts as possible to a presentation by manufacturers and encouraging them to quiz the manufacturers about their product.

Nursing home inspection units, in some cases, felt that they had an enabling as well as an inspection role, and kept manufacturers' literature for the use of homes. They felt that they could have a role in providing homes with better and more systematic information about beds, but did not feel it was their job to actually advise homes about purchase.

DLCs offer advice to homes, but some felt they were under-used in this regard.

The main issue for most homes in purchasing beds was cost, and some were reluctant to even consider higher specification beds for this reason.

Some nursing and many residential homes require residents to supply their own beds. Often relatives buy new beds, and there is a need for suitable information to be provided to help them choose appropriately for the new situation. In view of the manual handling implications outlined in Chapter 5 this practice should now be reviewed.

For equipment loans stores

While loans stores benefited from close relations with manufacturers and were well aware of what was on the market, like other purchasers, they would like comparative information about the function and quality of the beds available. This was particularly important to them, since most are required to operate on very tight budgets indeed and felt they could not afford to take the risk of purchasing something unknown, even though they knew it might benefit their client.

The recent formation of a forum for loans stores to share information and experience is encouraging, in that it could lead to better sharing of information both about what is available and what has worked to solve particular problems as well as sharing feedback from users. A recent study by the Disabled Living Centres Council[5] suggests that loans services could benefit by becoming more publicly accessible, and this would also lead to better use of information by all concerned.

For domestic buyers

Individuals wishing to buy 'health care' beds on their own have a large number of sources of information available to them. The problem is that, of the people we consulted, very few knew about them. Those we spoke to who had bought domestic profiling beds* had seen them advertised in the press and had contacted manufacturers for information. Only one, on whose behalf a bed was purchased by the health authority, had visited a DLC, despite the fact that these offer a one-to-one expert advisory service, with the opportunity to see and try out a range of beds. Experts from the DLCs themselves felt that the DLCs had an 'image problem' and were under-publicised and under-utilised. This is something which they are collectively trying to address.

Other sources of information are local occupational therapists, the Disabled Living Foundation, the Disability Information Trust and other local and national disability information services. These seem to be less well used than they might be: the problem may

* Profiling beds (domestic and hospital) have a mattress platform split into three, four or five sections, which may be angled for comfort and convenience.

be that people do not know that they exist, or, it was suggested, they do not perhaps connect the word 'disabled' with themselves (or do not want to). Some 'user' organisations offered information about beds, most notably the Muscular Dystrophy Association and the Motor Neurone Disease Association, which also loan equipment, but most such organisations felt that this was beyond their remit.

There is also some suggestion that elderly and disabled users may be targeted for the 'hard sell' by manufacturers of domestic profiling beds, but no one we spoke to had direct experience of this.

Choosing associated equipment

Those choosing do not know enough about what is already available

All classes of user described to us ideas for items of equipment related to beds, which they thought were novel. In fact, many of the things they suggested are already in existence. This again suggests a lack of accessible information to the public.

Some items chosen are unsuitable

Some items are not suited to the bed with which they are used, yet may still be supplied. For example, users told us of balkan beam assemblies which were too tall for lifts (with the bed on its lowest setting). Others told us of domestic hoists which did not clear the bed if a thick mattress or overlay was in use, which in some cases was the result of more suitable items not being available.

> *'We had a hoist that needed replacing. But they [the loans store] replaced it with a small hoist which wouldn't clear the bed ... It's about equipment services and knowing if it's faulty you send back and replace it with the same thing, not something else. But that was all down to what was in stock.' (District Nurse)*

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PART 3

Buying better beds and mattresses: the case for higher quality

Chapter 5

Key areas: occupant independence, pressure sores and back injury

Recommendations

Health care beds should be appropriately specified and designed to meet occupants' needs for independence, comfort and safety, as well as carers' and staff needs.

In most health care situations where occupants are confined to bed for a substantial part of the time, where they require more than a minimum of nursing care, or where their mobility is significantly compromised, powered variable-height profiling beds should be considered the provision of choice.

Suitable mattresses with adequate pressure-relieving properties should be provided for all occupants of health care beds.

We believe that there are substantial benefits to be gained from buying beds and mattresses to a higher specification than is common practice, although the evidence is not yet conclusive.

Main benefits fall into three categories:

- Increasing occupant independence
- Reducing risks of pressure sores
- Reducing risks to staff and carers of musculoskeletal injury (principally back injury).

There is as yet little published evidence about the impact of increasing independence on bed occupants, staff, and provider organisations. In view of its potential importance we hope that it will become a fertile field for future studies.

There is, however, evidence that reducing both pressure sores and staff injury is desirable for financial, as well as for humanitarian reasons, although both require an initial outlay on equipment and staff training.

Occupant independence

Limited evidence from small studies suggests that powered adjustable beds do have a positive impact upon the quality of life of disabled occupants at home[1] and that occupants in hospital make about twice as many movements within, into or out of bed as similar occupants of standard (adjustable but non-powered) beds.[2] Occupants who cannot change their position or reach things for themselves have little choice but to go without or to ask for help from staff who might otherwise be carrying out clinical or caring tasks.

Given that many ward staff are hard pressed, perhaps occupants are just doing without help from care staff, rather than allowing staff time to be saved. However, the equivalent of the time saving may allow care standards to improve.

Independence was an issue raised repeatedly in our consultation with users, carers and staff. While agreeing that sometimes the need for convenience of the staff might be in conflict with the independence of the occupant, generally it was seen to be in the interests of both to maximise the capacity of occupants to do things for themselves.

Hospital patients felt particularly helpless

'And you don't want to ask a nurse, do you, because . . .'
'No, they've enough pressure as it is.'
'You'd be more independent, you'd be less of a nuisance to the nurses.'
'Of course ... they've enough on their plate.'
(People after cardiac surgery)

Several suggested that patient-controlled powered beds would increase their comfort and independence, as well as for lightening the load for nurses:

'If you've got this facility, after 10 minutes you could alter it again, you couldn't be bothering the nurses at every little whim. Like I say, that is brilliant.'
(Woman after cardiac surgery)

A powered backrest, or a profiling bed, were seen as helping the occupant to change position and sit up from lying. Occupant-controlled height variation would help them get in and out unaided and get to things which would otherwise be out of reach.

'You can be in a sitting position with your feet out of bed and you can press it and it comes up high so that you can stand up, or even put your trousers on.'
(Man disabled by stroke)

'If the bed's not at the right height, they can't access the locker at all.'
(Staff on orthopaedic ward)

Occupants at home also valued independence

Many of those with powered beds felt they were an essential part of their life. One man, disabled by a stroke, was glad that he could change position in the night without having to wake his wife to help him. A young man with multiple sclerosis used his powered profiling bed both to help him change position and to sit up to watch television. He also used it to shed some dependence upon therapists by using it to perform his daily routine of passive stretching movements and to elevate his legs when they became swollen. Several of those interviewed suffering late effects of polio found a powered profiling bed essential to their independence at home.

Independence can foster recovery

Health care staff recognised that independence is self-reinforcing, and therefore an important element of the recovery process.

> *'With this bed, you see, he could sit up, he could bend his legs and then . . . he started to use his hands more because he could reach for a book, that sort of thing.'*
> *(Care worker, residential home)*

In some cases, this may be critical:

> *'Particularly with elderly patients, they lose confidence in front of your eyes . . . and sometimes small interventions mean that their confidence grows and then they'll do more things and they'll succeed with positive reinforcement.'*
> *(Doctor, elderly care ward)*

There is a fear that 'too high' a bed performance may jeopardise independence

One or two professional staff felt that there was a danger that a bed which does too much for the occupant might actually jeopardise independence, by accustoming them to having things done for them. Interestingly, several of the long-term disabled respondents who have powered profiling beds at home reported not using some of the facilities which they had available, but only using what they felt to be absolutely essential.

There is sometimes a perceived conflict between independence and other needs

Sometimes there was seen to be a conflict between the need for independence and other needs. Staff identified that those using pressure-relieving mattresses and overlays lost independence because it is so difficult to move upon such a soft surface. Moreover, an overlay often raised occupants to such a height that they were then unable to get in and out or sit safely on the side of the bed.

Independence was seen as of the utmost importance by bed occupants. In hospital they desired passionately to do things for themselves and were frustrated by having no control over the bed, so that they could not get comfortable unaided, sit up, get in and out or reach things. This was also felt by those at home, and many who had beds with height variability and/or profiling which they could control themselves valued very highly the independence which they brought.

> *'I'd need someone living with me or be in care if I did not. These type of beds are a real boon to the disabled.'*
> *(Woman disabled by late effects of polio)*

Preventing and treating pressure sores

Minimising the incidence of pressure sores in the ill and disabled population is imperative, on grounds of both humanity and cost. It is a well-recognised and researched problem. A meta-analysis published in 1995 of pressure sore prevalence studies, covering both hospital and community, found the prevalence to range from 4.7% to 18.6% of patients.[3] The annual costs of treatment of pressure sores for a 600-bed district general hospital were estimated in a 1993 Department of Health report to be between £0.64m and £1.15m; the total costs estimated for the total (then) of 209,000 hospital beds in England were between £180 and £320m.[4]

Prevention is also expensive but reduces the risk of litigation costs

Prevention is also costly in financial terms, but reduces the very real risk of potentially large litigation costs. A recent case brought against a hospital by a patient who developed a sore led to the award of £4,500 in damages.[5] In two similar cases, nursing homes had to pay £3,500 and £12,500 respectively.[5] It has been shown that a systematic programme of staff training, risk assessment, the targeted use of pressure-reducing support surfaces along with inspection and replacement of standard mattresses, can significantly reduce incidence in both the hospital and the community.[6,7] A 1997 King's Fund Organisational Audit of a medium-sized acute hospital showed that pressure sore prevalence had been reduced from more than 6% of patients to just over 3% three years later, allowing a very active and sustained prevention and treatment programme.

The mattress upon which an occupant rests is crucial in determining whether or not he or she develops a pressure sore. Some tissue viability nurse specialists suggested to us that there remain too many old and worn out mattresses in hospitals, which put patients unnecessarily at risk. The new NHS contract mattress introduced in 1998 has significantly greater pressure-relieving properties than the old 'DHSS' marbled cover mattress, which has long been standard on hospital beds. If the new mattress is widely adopted and replaced frequently enough, it should contribute to an overall decrease in incidence.

New evidence suggests that positioning the occupant with support under the knee and calf can contribute significantly to reducing pressure on the heels of occupants as well as friction and shear on the sacrum, thus reducing the risk of sores.[8] Such positioning can be easily achieved by use of beds with a 'profiling' facility.

Reducing back pain in staff and carers

Staff in all branches of health care are affected by back pain. The incidence is particularly high in the nursing profession, with a recent survey reporting that one third experienced regular back pain at work, and that two in five said their pain was caused or made worse by work.[9] A study of radiographers found that 47% related their back pain to working with patients who are in bed.[10]

Manual handling accounts for more than 25% of all workplace accidents reported to the Health & Safety Executive each year, of which the majority result in over-three-day

injury, most commonly affecting the back.[11] However, this figure is considerably higher in the health services, standing at almost 50% in 1990/91.[12] Another study of nurses quoted 52% of handling accidents as involving the bed itself, with the most frequent activity at time of accident being moving a patient up the bed.[13]

In recent cases where injuries have destroyed people's careers in the health care services compensation of between £150,000 and £345,000 has been awarded.[14] Yet this will not be the only cost incurred. Every incident must be reported (at least internally), with possible investigation costs and treatment costs. Longer term, there may be time lost through sickness absence, there will be the costs of recruiting and training replacement staff, pensions for injured employees, fines for breaches of legislation along with legal costs in defending a court action, increases in insurance premiums and the costs of increased length of stay should a patient also be injured.[15] While insurance premiums may increase for hospitals with a poor track record for accidents, it is worth remembering that one hospital which actively sought to improve its health and safety procedures and practices, succeeded in reducing the premium from a quote of £500,000 in 1994 to a paid premium of just £53,800 in 1996.[15]

Yet single incidents are only one cause of work-related back pain. It is widely accepted that cumulative back stress also predisposes the spine to pain and/or injury[16] resulting from repeated loading of the spine, e.g. heavy lifting, or from working in a poor posture. It is worth noting that nurses have been estimated to spend 22% of their shift in a stooped position.[17] Poor posture is a particular problem in the community, where there is a high proportion of low fixed-height beds and double beds. 'The continued use of non-adjustable beds for patients requiring more than an absolutely minimal degree of nursing care cannot be condoned.'[14]

Variable-height beds can help to reduce the amount of back stress experienced by staff and carers. The easier the height is to adjust, the more likely it is to be altered by staff.[14] Indeed, an observational study of nurses in one ward found that foot pumps were rarely used, in spite of the consequences on body posture during manual handling, while motorised height adjustment was used 86% of the time when making the bed and 29% of the time when bathing occupants in bed.[2] In general, 'motorised adjustment mechanisms are the design of choice'.[14]

Profiling can also reduce levels of back stress by eliminating the need for manual handling in many instances and by reducing the risk of any remaining handling.

Following chapters in this part of the report

Remaining chapters in this part of the report discuss what could be improved now for beds in nursing, residential, and domestic homes, and for mattresses generally.

Many of the improvements in the quality of beds in hospitals depend either on improving selection processes or on possible changes to the specification and design of hospital beds. The former were covered in Chapter 4. The latter considerations are deferred to the final part of the report about better future possibilities (see Chapter 10).

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Chapter 6

What kind of beds are needed in nursing homes?

Recommendations

Variable-height beds should be routinely available and preferably standard in nursing homes.

Profiling beds, or at least powered rising backrests, should be provided for all residents with limited mobility (and preferably for all residents).

Homes should take advantage of the availability of beds which have variable height and profiling yet have the appearance of domestic beds.

Beds must allow sufficient clearance underneath for a hoist.

Variable height

Care staff in nursing and residential homes felt the need for variable-height beds, both for their own safety and for the dignity of residents. They thought that manual handling of residents would be reduced if beds could be put at the right height for getting in and out, and at the right height for staff when making beds or attending to residents who are in bed.

> *'I certainly think some way of adjusting the bed so it actually meets the needs of the resident, but at the same time it can aid the worker as well, no matter what height or weight they are.'*
> *(Residential home worker)*

The homes had policies and training on manual handling, and equipment was available, though how enthusiastically it was used varied between homes. One reason cited for not using hoists was lack of clearance under the beds, as well as insufficient room in the bedrooms to allow manoeuvring of a hoist.

Backrest

Staff reported struggling to bring residents in divan beds into a sitting position, and most felt that a backrest was needed. Divan headboards were not robust enough, nor at the right angle to support an occupant in sitting.

> *'...one of the ladies here, when we give her night medication, we actually climb in the back of the bed and support her from behind so she can get her tablets.'*
> *(Care assistant in nursing home)*

Profiling

Among our sample, to many staff the idea of a profiling bed was so far outside their experience that they felt unsure whether it would be helpful. Those who had experience felt that it would:

> *'We've got one of those electric beds ... the carer can actually switch the power on and it'll gently lift the person into a sitting position and when you've finished feeding you can slowly lift them back again.'*
> *(Nursing home matron/proprietor)*

Both in the homes and in hospitals, some staff were concerned that residents might find 'being profiled' frightening, and in both situations the need for training of staff to use the beds properly was mentioned.

Associated equipment

It is possible to use alternative 'associated' equipment to achieve some of the functions of a powered variable-height profiling bed. A divan can be placed upon a bed-lifting device to achieve variable height and separate powered backrests are available. We did not find that these were commonly used in homes and it may well be that they are in themselves inconvenient to use or do not achieve the desired functions so successfully. It should be noted that community health staff told us that the attachment of some items precludes the use of others, so only a certain number of items may be attached to the bed.

> *'And you can't put them [mattress variators] with the divan cot sides because the cot sides for the divan bed go underneath the mattress.'*
> *(Community occupational therapist)*

They also told us that the attachment of such items may hinder other activities.

> *'All the sorts of transfer equipment that we can attach to the bed often make it difficult for some other activities to go on. Say a leg lift or something at the side of the bed makes it difficult for them to get up or to get washed and dressed because they can't get their feet like under.'*
> *(Community occupational therapist)*

Appearance

The appearance of the bed was a subject much discussed by home owners and staff. By some it was seen as a requirement of the registering authority that rooms be 'homely' and this was interpreted as meaning that beds must be of the ordinary domestic divan type.

> *'I would like to continue using a hospital bed for the protection of the nurses' backs and for ease of movement in lifting handicapped patients in and out of bed, but the Inspectorate don't want that because Laura Ashley doesn't make bed covers to match.'*
> *(Nursing home matron/proprietor)*

Some seemed to be unaware of the availability of models which combine the height variability and/or profiling with a more 'domestic' appearance. A number of homes have solved the appearance problem with purpose-made valances or extra large duvets to disguise the underbed mechanism.

Appearance may perhaps be more a concern of home owners and managers than of residents:

> *'It doesn't bother me, it doesn't bother me at all. As long as it does what I want it to do, that's all I'm bothered about.'*
> *(Resident, residential home)*

Size

Another objection to the use of hospital-type beds in homes was the feeling that they were too big for the rooms and that it was difficult to get them through doors. Although doubtless many homes have adequate doors, and some may use the type of nursing bed which dismantles, this was not the case everywhere.

Mattress cover

Hospital-type beds were seen as better for incontinent residents: although divan mattresses could be plastic-coated, they and the bases could sometimes become impregnated with urine. While recognising that mattresses must be waterproof, staff thought that they were hot and sweaty for residents and were eager for mattress covers in 'breathable' fabrics.

Cost

The cost of beds was uppermost in the minds of the proprietors, and most felt that any but the most basic type of bed was beyond their means. Care staff in one home complained of backache from working, though tended to see it as 'part of the job'. This did not appear to figure in the proprietors' calculation of the 'cost' of a bed. It would be desirable to have fully height-variable and profiling powered beds as standard in homes, so that all their facilities become available immediately a resident becomes ill or loses mobility, without the need for the upheaval of changing beds or rooms. However, this is unlikely to happen in those homes whose financial position is precarious.

All homes should have the capacity to ensure that any resident who requires more than the minimum of nursing care is nursed in a bed with variable height.

Chapter 7

What kind of beds are needed in occupants' own homes?

Recommendations

Variable-height beds should be considered by, or on behalf of, anyone with severely impaired mobility or in need of nursing care.

Profiling beds, or at least rising backrests are desirable for many.

Beds should allow sufficient clearance underneath for a hoist.

Loans stores need adequate funding to be able to supply and maintain appropriate beds.

Beds for loan should be easy and safe to transport and assemble.

Beds purchased by occupants themselves are a very individual matter

Many of the seriously disabled people whom we consulted had their own powered profiling beds. Variable height was less common. Some felt that the independence and comfort brought by profiling were invaluable and that the variable height made the lives of carers easier.

Occupants were, on the whole, less concerned with the look of the bed than might have been supposed from the opinions of the district nurses we interviewed, who felt strongly that people wanted beds to look 'normal'. It was more important to occupants that the bed did its job. This may reflect the bias in our interviewing towards long-term disabled occupants, whereas the nurses were dealing more with terminally ill people or with those recovering from acute illness.

The weight of a bed for manoeuvring and of a mattress for turning were important to disabled occupants and their carers. Size was important too, and the difficulty of fitting a bed into, and manoeuvring a hoist around in, a confined space was sometimes acute.

Other comments about beds related largely to matters of opinion and personal taste concerning comfort, the usefulness of double beds with a profiling facility and the need for small items of associated equipment.

On loan from loans stores

Most of the points made in the above section on nursing homes apply to beds for use in the occupant's own home. Carers themselves are often frail and lack helpers. Many have,

therefore, an even greater need than nursing home staff for the bed to lighten the load of caring for the occupant and for avoiding injury; occupants have the same need for independence.

Transportability

The other main consideration for loans stores is transportability. Beds must be capable of being dismantled and carried in confined spaces and up awkward staircases. This means that component parts must be light and yet capable of quick assembly. *The Manual Handling Operations Regulations 1992*, where weight of a load exceeds their guidance figures, require a detailed risk assessment to be made and risks to be reduced as far as is reasonably practicable. Some manufacturers claimed to have developed beds which meet all the requirements of the regulations. However, their beds dismantle into pieces which individually are likely to exceed the guidance figures, where the weight limit depends on the height at which the load is lifted and carried, and the posture of the lifter. These figures may be further exceeded when the bed is being assembled or dismantled, as this means that the weight of more than one piece may need to be lifted at the same time. For a man, lifting in a good posture with the load at waist height, the maximum recommended weight is 25 Kg. For a woman lifting under the same conditions, the guidance limit is 17 Kg. Above or below waist height (or where a load is held away from the body), these limits decrease.[1]

Cost

Many loans stores have inadequate budgets to meet the needs of their clients fully, and their choice of beds is dominated by the consideration of cost. Generally, they purchase cheaper beds in order to meet the demand for quantity, and this precludes purchase of more expensive beds. This is a situation which might change with the increasing privatisation of loans services.

Maintenance

Some loans store staff expressed concern that introducing powered beds would bring with it a need for more, and more complicated, maintenance and repair. Manufacturers dispute this, maintaining that powered beds require very little maintenance and are, on the whole, reliable.

Appearance

However, although appearance is important in domestic homes, this has to be balanced against the need of loans stores to be able to transport and clean the beds. Damage is likely to happen in transit, and domestic-style headboards, for instance, may be vulnerable.

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Chapter 8

Is the powered variable-height profiling bed the answer?

Recommendations

On balance, powered variable-height profiling beds are the ideal for most circumstances.

Such beds are not considered usual in the current health care climate. With the introduction of such beds there will be a need for staff to receive training in how to make the most effective use of them.

Occupants need assessment to determine which facilities they need, and how they should be used.

Overall the consultation findings confirmed that from many points of view, most notably that of injury to staff and carers, and for the independence and comfort of occupants, it is desirable in all health care settings to have powered variable-height profiling beds.

Some reservations were expressed, however. At least some of this seemed to stem from the unfamiliarity of staff with such beds and the feeling that such a development was so far out of reach in terms of cost that it was not worth serious consideration. This view was sometimes based on actual knowledge of prices and sometimes not. It was apparent that using such beds in hospital would require some changes in practice and that staff would need some training to help them make the best use of the beds.

There was a feeling among some nurses in a unit, where active rehabilitation played a major part, that profiling beds would accustom the occupants to having things done for them, and that in the long term this would be detrimental to their ability to cope in the world outside the ward. In another hospital setting, however, staff felt that the independence gained by occupants from being in such a bed would actually encourage them to further independence.

Another concern was the competence of occupants to operate such beds. It is clear that for the many who would be incapable of operating the beds themselves, the advantage to be gained from them would be for easing the work of staff or carers and only indirectly to the occupants themselves.

Problems were described with mattresses which did not conform adequately to the contours of the profiled bed, with the slipping of mattress overlays on profiling beds and that the profiled bed was too short for tall occupants. All these problems can be solved.

Mention was made of the discomfort of sleeping in a profiled position and of its hindering turning over during sleep. It may be that with adequate occupant access to the controls this difficulty can be overcome, or it may mean that the profiled position during the night must be used very selectively, and with adequate training of the occupant and staff.

In some places where beds are used, access to an electric socket is difficult without creating a hazard with the cable. Where a large number of electrically-operated beds are installed it must be ascertained that the electricity supply and number of sockets are adequate.

It is essential that beds are reliable and well-maintained, especially at home where there may be no one to help. One occupant at home described being stuck for some hours in the bed in one position while he waited for a technician to come and repair the controls. In another instance, a disabled woman had had to get rid of a bed which was not working, because the manufacturer had gone out of business and she could find no one else to repair it.

Some doubt was expressed by loans stores as to how well such beds would withstand the vigorous cleaning which their equipment has necessarily to undergo. Manufacturers assured us that cleaning is safe and on most models the electric motor can be easily detached for cleaning.

Chapter 9

The role of mattresses

Recommendations

Only mattresses which provide an adequate standard of pressure reduction* for low-to-medium risk occupants should be purchased for general use in health care. All mattress covers should adequately disperse humidity.

Mattresses in all health care facilities should be regularly turned and inspected, and replaced before they become hazardous to occupants.

For domestic beds there should be a universal rating system for firmness.

Impartial advice should be made available for those purchasing mattresses for domestic use, and realistic trialling of mattresses should be possible.

There is a great deal of good information available about mattresses and their relative effectiveness for the prevention of pressure sores. It is not within the remit of this report to explore the issue of tissue viability, but rather to take a more general view of mattresses. For occupants the primary issue is comfort, and some dissatisfaction was expressed among those with experience of hospitals. Some complained of discomfort on the standard hospital mattress and some had found their mattresses to be worn out:

> *'The mattress was dished, sort of thing, and I couldn't get comfortable at all . . . They were old, that's what I think, by wear.'*
> *(Patient after heart surgery)*

Tissue viability nurse specialists described the financial constraints on replacement of worn-out mattresses. This was echoed by other nurses who felt that in some hospitals replacement did not always happen often enough to prevent penetration of the mattress core by fluids, thus leading to an infection hazard. Experts recommend a regular routine of turning to prolong the life of a mattress and of regular inspection to ensure that the cover remains intact.

Occupants complained of how sweaty the plastic covers made them, and of how slippery they were. The first of these problems has been addressed to some extent by the use of 'breathable' fabrics (included as part of the specification for the 1998 NHS contract mattress) which are standard on many available mattresses.

Pressure-relief overlays were found to be comfortable but caused a variety of other problems.

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* The DHSS (marbled cover) mattress does not meet these requirements. The NHS contract mattress introduced in 1998 is adequate.

There is some conflict between the need for relief of pressure and other needs. Pressure-reducing mattresses are effective in the prevention of sores, but are so soft that many staff complained that they limit occupants' ability to move independently.

'The firmness of the mattress. I'm talking about the ability to turn ... being able to turn over in the bed or move back up the bed themselves ... I think it's more difficult to move on a soft mattress because you've lost half the purchase, haven't you?'
(Community physiotherapist)

They also made it difficult for staff to move occupants.

'You're just sinking down into the mattresses and they're not moving anywhere.'
(District nurse)

Both therapists and doctors found such mattresses very difficult as surfaces upon which to give treatment.

'You try to put a spinal in on an old man, turn him on his side in the bed and he sinks down in the bed and where you're aiming for is down in the mattress, you can't do it.'
(Hospital doctor)

Thicker mattresses (150mm or over) can make a bed too high, even on its lowest setting, for some hoists to clear it, and may make it difficult to use a pull-out backrest. Another problem can be that thicker mattresses may not conform well to a profiling bed, and hinged mattresses were considered preferable.

In considering beds for domestic use, all these issues apply where occupants are confined to bed for long periods. For more normal use, however, and where occupants are buying their own beds, the main problem highlighted by the consultation was that of the correct choice of firmness of the mattress. Some of those we talked to suffered from severe chronic pain and comfort in bed was of the utmost importance. In buying a domestic bed, they felt a need for advice from an independent source and for an opportunity to really try out a mattress.

'Why don't you have a lab, a sort of hotel I suppose, or some research facility where we and other guinea pigs could go and spend the day and night or several nights.'
(Man with ankylosing spondylitis)

They felt there was an urgent need for some sort of universal rating system for the hardness of mattresses, so that people could know what they were buying.

'You need a range of standards so you can go out shopping for a mattress and irrespective of the manufacturer. You'd have a code, like tog values on duvets.'
(Man with ankylosing spondylitis)

PART 4

Better future choices

Chapter 10

Improving the standards

Recommendations

The next time British or European standards for health care beds are revised, the suggestions in this chapter should be considered for incorporation.

Manufacturers should consider improving their designs in response to the user feedback reported here and to the other recommendations in this chapter.

Those currently choosing beds in hospitals may wish to consider some of the information in this chapter when making their selection.

The current British Standard Specification for Hospital Bedsteads is only suitable for hospitals. In the absence of a current alternative, beds based upon it have been used in nursing homes and occasionally in other community settings. Our consultation indicates that it is not really suitable for these settings. These comments therefore relate to the use of these beds in hospitals, although most could also be incorporated into any recommendations for health care beds elsewhere.

The standards could be improved in several respects

- The current British Standard Specification for Hospital Bedsteads includes a specification for fixed-height bedsteads. *It should be made very clear that such bedsteads are entirely unsatisfactory for anyone requiring more than the minimum of nursing care.*
- The specification for adjustment of backrests does not make it clear that the backrest should be adjustable by one person without strain and *with a dependent occupant.*
- Popliteal height* (based on 10th percentile female, 60–90 years, in the King's Fund specification[2]) forms the basis for the lowest point to which a bed should adjust. This is an important factor for occupants when getting into bed. Given the increasing thickness of mattresses (desirable to prevent tissue damage and improve occupant comfort) and use of pressure-relieving overlays, it appears necessary to reduce the height to the top of the mattress platform. At the next revision of the standards, the specifiers should consider by exactly how much. However, we would expect it to be substantially lower than in the current British Standard.
- Comparing figures from the original specification with 1995 Health of the Nation data,[3] it is evident that the population is increasing in stature. At the next revision of the standards, the specifiers should consider how much increase in bed length (between head and footboards) should be incorporated, by a combination of enlarging the distance between head and footboards and by enlarging the maximum extended length. Such an increase in overall bed length could have implications for current and future building dimensions, in particular lifts.

* i.e. height from floor to underside of knee when seated

Bed length consists of space for the patient to lie down plus some essential extra space (clearance) for comfort and to accommodate changes in posture. The King's Fund specification (and so BS 4886) allows 108mm of clearance. However, in the last two decades, this clearance has been reduced as the population has grown taller:

Unextended bed length (based on 75th percentile male): clearance reduced by 23mm

Extended bed length (based on 99th percentile male): clearance reduced by 26mm

- Although no one whom we consulted made a case for increasing the height to which a bed must be able to be raised, the increasing stature of the population may indicate this is necessary, as there are likely to be corresponding changes in standing elbow height (based on 90th percentile female in the original King's Fund specification). This forms the basis for the highest point to which a bed can adjust. If the bed is too low, it will adversely affect the posture of taller staff, when using the bed as a worksurface. Specifiers should consider this at the next revision of the standards.
- More prominence should be given to ease of cleaning, especially with regard to the mattress platform.
- For safety, at least 3 of the 4 castors should be braked, and controls for brakes and height adjustment must be easily accessible even with the bed in its lowest position.
- There should be integral attachment points for attaching catheter bags and possibly other devices.
- To reduce the tendency for occupants to slide down the bed when sitting up or tilted, the mattress platform should ideally be four section profiling.

Other design problems identified by respondents

Rather than being limitations of the specification, these reported problems may have arisen for a variety of reasons. It may be that those interviewed had experience of beds which had been inadequately maintained, or had been used beyond their expected lifetime. It may be that, in some instances, not all criteria of the specification had been met by the manufacturer. It should be noted that:

BS 4886: 1988 A.1.2 'It should be possible for all adjustments of the bedstead to be made by one person working alone without the aid of tools or power sources, although power tools may optionally be used'

These are some of the problems described, and it must be clear that these do not apply to all, or even necessarily to a majority, of beds. All references to standards are to BS 4886: 1988, unless otherwise stated:

- present designs of pull-out backrests cannot be safely operated by one person working alone (the original King's Fund specification specifies 'one *woman* working alone'), especially if the occupant needs support at the same time. Nor can some operate over thicker mattresses

- pull-out backrests are awkward to use, often to the extent of being a hazard for manual handling

  A.1.4 *'The action of the back support adjustment should be light, smooth and should not be prone to jamming . . . It should be possible for the attendant to adopt a correct posture and work without strain when adjusting the back support'*

- operating the rising backrest puts an unacceptable load on the attendant

  (see above, A.1.4)

- buffers do not always work properly, resulting in damage to walls

  5.10 *'Buffers shall be fitted with a rotary buffer at each corner of the frame, adjacent to the mattress support platform'*

- safety rails protrude from the edge of the mattress support platform, increasing the distance across which staff must reach and causing both staff and patients to knock against them

  A.1.5 *'The safety sides . . . when collapsed, should not hamper access to the patient, bedmaking or other nursing procedures.'*

- there is nothing to retain the pillows in position

  A.1.4 *'The design of the back support should be such that the pillows do not readily slip out of position'*

- adjusting the height with an occupant on the bed requires an excessive amount of force from the attendant

  14.2.1 *'When a uniformly distributed load of 76+/-2 Kg is applied to the mattress support frame, the force required to operate the pedal or lever shall not exceed 220N (23kgf)'*

- operating the tilt mechanism with an occupant on the bed obliges the attendant to take an excessive amount of weight

  5.3.6 *'When a load of 76+/-2 Kg is applied to the mattress support frame . . . the force required to tilt the mattress platform shall not exceed 220N (23kgf)' (The King's Fund specification also states this should be so, 'Since it is expected that the tilting of the mattress support shall normally be carried out by one woman').*

- it is not always possible to fit hoists, portable diagnostic or treatment equipment, or over-bed tables under beds

5.14 'The underbed clearance, when the top of the mattress support platform is positioned at a height of 610–15mm above the floor, shall not be less than 114mm from the floor.' Note: Specifications for the clearance required by and for mobile bedside equipment were only introduced in 1988. Older beds which predate these requirements may not allow such equipment to fit under the bed.

IEC 601-2-38 (Part 2) (Draft European Standard)[4] *'Beds should allow a clearance between floor and the base frame of 150mm to accommodate equipment which requires access under the bed.'*

- the bed damages the wall when it is being tilted

5.2.3 'With the headend of the bedstead a distance of 205mm from a plane vertical wall and with the foot end of the mattress support frame raised to give 6 degrees of tilt, the headend structure together with the lifting pole and its attachments as provided by the manufacturer shall not touch the wall.'

- height adjustment of the bed is jerky and uncomfortable for the occupant

14.2.2 Note 'The movement of the mattress support frame during raising or lowering should be smooth and, if a continuous height adjustment system is fitted, should operate at a rate which can be controlled.'

- head boards are difficult to remove as quickly as is necessary to perform emergency resuscitation on a patient

5.5.1 Note 'By removal of the headend structure and, if necessary, the footend structure and any attachments, it should be possible to obtain all-round access to the patient.'

A.1.2 'It should also be possible for one person working alone to remove, carry and, where necessary, stow or replace on the bedstead any part of the structure intended to be detached for nursing purposes.'

Other recommendations

- the population is becoming heavier as well as taller*. It is to be expected therefore that an increasing proportion of heavy-duty beds will be needed and arrangements need to be put in place to secure their availability, at appropriate notice and at the required location.
- serious consideration should be given to the specification, including a four-section profiling mattress platform, which would be powered and capable of operation by the occupant
- serious consideration should be given to the specification, including a powered variable-height mechanism, capable of being operated by the occupant (it should also be possible to limit the occupant's access to the controls where necessary)
- it would be very helpful if a means could be found to standardise the fitting of attachments so that they could be interchangeable between beds. (See *incompatibility between models* below, for further discussion)

* Based on a comparison of data in the *Health Survey for England 1995* [3] and the King's Fund specification[2]

- if standardisation is not possible for all attachments, it should be possible at least for the method of attaching and detaching bed ends to be standard, since they need to be removed quickly for emergency resuscitation.

It should also be borne in mind that BS 4886, even if it were to be updated, represents a *minimum* standard for hospitals. In reality, such a bed is not ideal in all circumstances, and many specialist areas within hospitals would benefit from beds adapted to their particular needs, though ideally based upon this specification. Maternity services, for instance, represent a substantial proportion of the NHS's bed occupancy: midwives interviewed felt that the mattress platform should be increased in size (although there could be a potential conflict with ease of delivery of care), and safety sides adapted to allow babies to sleep with their mothers. They also felt that occupant-controlled profiling beds would be tremendously helpful for the independence of mothers, particularly after Caesarean section and for encouraging breastfeeding.

Incompatibility between models

Hospital users complained that existing equipment, such as safety rails and balkan beam assemblies, often did not fit newer beds and that new equipment often did not fit older beds. When this resulted in the accumulation of a variety of models, it led to extra costs and difficulty with storage.

It also caused confusion among users who are unlikely to be familiar with all variations, especially where a number of types may be in use in one location. This could possibly lead to product misuse and may mean that staff familiar with particular models are likely to spend time helping out those who are not.

> *'If I have to lend equipment to another ward, I have to ask them which bed it is and often they can't tell me so I then have to go and look at the bed to say this will fit it or that will fit it.'*
> *(Senior Nurse Manager, orthopaedic ward)*

A possible solution suggested to us was that all fittings should be standardised.

References

1. British Standards Institution, *British Standard Specification for Hospital Bedsteads (BS 4886: 1988)*
2. King's Fund, *Design of hospital bedsteads*, London: King Edward's Hospital Fund for London, 1967
3. Joint Health Surveys Unit, *Health survey for England 1995*, London: The Stationery Office, 1997
4. IEC 601-2-38: *Medical electrical equipment – Part 2: Particular requirements for the safety of electrically operated hospital beds*, (DRAFT, May 1996)

Chapter 11

Making continuous improvement possible

Recommendations

We believe that present arrangements for choosing, using, and developing health care beds and associated equipment need substantial, sustainable improvement. Several principles should underpin that improvement:

- systematic design and routine processes for continuous innovation will work even better in the medium to long term than intermittent 'one-off' interventions, however well done
- proposals which improve the operation of the 'marketplace' are preferable to centrally mandated solutions
- improvements to the marketplace should operate in the best interests of users of the products and services concerned.

A forum to promote and sustain this improvement, as recommended in the next chapter, should be considered.

Replacing 'one off' with 'systematic' innovation

Routine collaboration can enable each stakeholder in the marketplace to continue to get the up-to-date information they need to use their resources to best effect. Intermittent interventions may bring together users and innovators temporarily with productive results, but do not provide ongoing support to continuous product and process improvement.

At present, this continuous improvement process cannot work well for health care beds, since we found that the necessary information is only collected, analysed or passed on in a piecemeal and incomplete form, if at all.

What we believe is needed are better, sustained links between the different groups of stakeholders, and better structured and more coherent information flows between them.

The original King's Fund team used a structured and at the time unusual 'systematic method' for designers to link users and innovators in the one-off process of developing a hospital bed specification. The same principle has been applied to continuous design development for wheelchairs,[2] and could provide an effective process for health care beds and related equipment.

Marketplace principles which benefit users

Healy[3] set out a series of principles which should be followed to allow the marketplace to work in consumers' (in this case users') interests.

The principles of **value for money** and **safety** cover the overall quality of equipment, including its effectiveness and fitness for purpose, and costs and benefits.

Information, equity and access are essential for effective **choice**, because without them users have no guarantee that they will be able to get the product that would best met their needs.

Redress and representation are concerned with assuring that the user voice is heard during planning and delivery of products or services, and that losses caused by poor quality goods or services are not borne directly by the user.

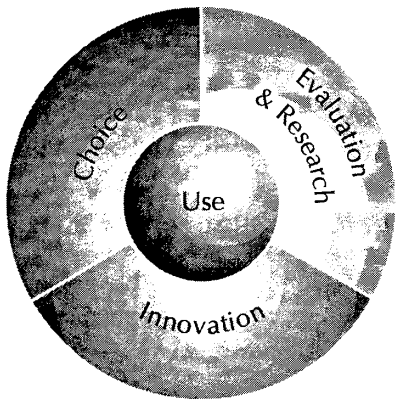
Stakeholders' information needs

Relevant stakeholders include:

- users – occupants, carers, and other staff working on or around the bed
- those choosing beds
- evaluators – both individual users, and organisations concerned with product safety and fitness for functional needs
- innovators – designers, suppliers, and manufacturers.

Each needs information from the others to perform their own role to best effect.

Systematic innovation for better beds in health care



This diagram shows the essential processes which are involved in innovation. For innovation to happen successfully, links and information flows should occur across all boundaries.

Users need a way of giving feedback

Users need a way to tell those choosing beds and the evaluators and innovators what they need, and what works or does not work in present designs. We have developed a framework (embodied in the *Guides*) to help describe these needs and problems in a more consistent and complete way, based on findings from our fieldwork.

For the process to work routinely, users need also to have a channel through which to provide this feedback. Such a channel is not generally available, except in a few places as a result of special local initiatives.

Those choosing beds need information that is not readily available

Those choosing beds should base their choices on information about:

Users' needs: What do I/users need to do? Where do I/users do it? What problems do they have? How can I find out or confirm what others in similar situations have found?

Beds: What types are available? What do they do?

Bed performance: How well do they perform? What do other users think? What do independent tests show?

Costs and benefits: What will they cost to acquire? What are the other costs and benefits over their lifetime?

We have assembled some of this information in the *Guides* but it will need continual updating, and further research is needed to establish the costs and benefits in UK conditions obtainable from higher performance beds, which are not yet widely used here.

Those choosing beds may find themselves doing so only occasionally, and they often find it hard to make contact with others who have relevant experience.

Evaluators need criteria for judging performance

Health care beds must meet a complex series of clinical, caring and living needs and, as such, they could therefore arguably be evaluated as 'medical devices', assistive technology, 'tools for living'[3] or even as domestic furniture.

Each of these areas requires different types of performance and quality measures. To make this information available and useful to users and innovators there is a need for appropriate tests and methods for disseminating the results. Progress towards achieving these goals is uneven. Various agencies exist which do or could provide some of these functions, with different underlying philosophies and practices.

Medical devices are checked for safety risks

There is a well developed system for reporting hazards and critical incidents for medical devices, and the Medical Devices Agency issues 'hazard notices' to alert services to the potential risks in the equipment they are providing or using.

Assistive technologies are mainly evaluated for clinical and technical performance

Methods of evaluating assistive technology, such as mattresses, wheelchairs and hoists have been developed in this country and overseas. Testing procedures are often directed towards clinical and technical performance rather than users' own functional and living requirements.

'Tools for living' approaches use criteria which include user requirements more fully

'Tools for living' approaches[4] embody a broader view which can reflect the full range of users' requirements. As well as clinical and health considerations, users' own living, social and functional activities must be taken into account. This area is the least well developed in terms of evaluation methods and of dissemination. The King's Fund *Guides* contain initial suggestions on identifying which aspects of bed performance are necessary and how to evaluate their quality, but there are few existing agencies who might apply this approach to beds and related equipment.

Existing evaluations of beds are limited

Apart from the Consumers' Association's evaluation of beds[5] little information is available to help choose general-purpose beds effectively.

A broader range of methods are also being developed by some hospitals so that they can compare the quality and effectiveness of different beds for use by patients and staff in hospitals. The results of such trials are potentially of great interest to others but, apart from publication in the usual way, no system for networking or dissemination has been established.

Innovators need better information on user needs, problems, and gaps in the market

Innovators need information from those choosing, using and evaluating beds to find out how well their products meet their users' needs and how they compare with competitors for price and performance.

They need to know about:

Needs: What do users need? What do they need to do? Where do they do it? What problems do they have? What constraints and pressures face those choosing?

Products: What products are already available on the market? What do they do? Are there gaps in the market?

Product performance: Does my product/service meet user needs well? Does it compare well with my competitors' products and services? Is it vulnerable to competition?

Costs: What price can those choosing my product afford? How do the benefits and costs of my product compare with its competitors? Do my customers understand these costs and benefits?

At present, they can only get this information through their own sales information and from market surveys that they may carry out. They have limited access to:

- comprehensive and detailed analyses of user needs
- up-to-date comparative evaluations of their products.

Innovators will also wish to have easier ways of making known what they have designed and/or brought to market, and do so in such a way as to ensure that their products are properly considered in the choice processes.

Arrangements to support systematic choice, use and innovation could be much improved

Systematic links between users and innovators have not so far been well established, in part because so many disparate organisations are involved, and in part because of the lack of a suitable organisational focus. A large number of statutory, commercial and voluntary organisations have a stake in promoting better health care through improved choice and innovation of health care beds. These organisations supply beds, and/or provide information and advice about them.

They include local and central providers and commissioners of health and social support services, NHS Supplies, equipment loans stores, the British Surgical Trades Association, Disabled Living Centres, the Disabled Living Foundation, the Disability Information Trust, manufacturers and retailers, and a wide range of disability organisations, charities and user groups.

These stakeholders have no established forum where they can meet to express and pursue their mutual interests in choosing and developing better beds. Many of those to whom we spoke would welcome opportunities for joint planning to identify and meet their common priorities and have expressed the need for an organisation with the appropriate standing and independence to lead the initiative.

Those choosing beds, users and evaluators are often structurally and geographically remote from one another and often lack the opportunities and methods that would enable them to share information. For example, people who are newly confined to bed will be quite unfamiliar with their new situation and may lack contacts with the organisations and individuals who might be able to advise them on their choice of a new bed. Many equipment loans stores or hospital purchasing departments are centralised or remote from their users and, despite some admirable individual initiatives, they have no

routinely established methods of obtaining feedback from them. As a result it can be difficult for them to make sure that their purchasing strategies closely match the needs of their users.

More research is needed into the 'lifetime costs' of beds

Poor-quality beds can exact a heavy toll in terms of lost user independence and, productivity, delayed recovery, staff injury and litigation. While it is easy to identify the capital costs of purchase, it is difficult to estimate the revenue costs and benefits across the 'lifetime' of a product. As a result, selectors are rarely able to take these into account in their purchasing strategies.

We found that it was very difficult to quantify the potential benefits of increased user independence, reduced back pain for carers and staff, prevention of pressure sores, and reduced infection from higher-performance beds, but qualitative information suggests that the benefits can be significant.

Better use of information technology could improve information capture and exchange

Users of health care beds, service providers choosing beds and carers offer a valuable source of expertise and feedback on their needs and problems. Unfortunately, they often work in isolation and have few opportunities to contact and learn from one another.

Better use of information technology could provide the infrastructure and methods to enable this resource to be developed and used in health care.

References

1. Archer, LB, *Systematic method for designers*, London: Council for Industrial Design, 1965
2. Mitchell, JC and Bennington, J, MF *maps and the systematic choice, use, rating and innovation of wheelchairs*, Sheffield: Health Research Institute, Sheffield Hallam University
3. Healy, M, *Some working principles for organisations representing consumers*, London: National Consumer Council, 1984
4. Woolf, HS, *Tools for Living*, In Bray, J and Wright, S, *The use of technology in care of the elderly and disabled: tools for living*, on behalf of the Commission for the European Community, London: Pinter, 1980
5. Consumers' Association, A bed time story, *Which?*, March 1991, pp 126–129, London: Consumers' Association

Chapter 12

A forum for continuing partnership and collaboration

Recommendations

A forum should be established which would encourage effective commissioning of beds and related equipment for health care. It would provide a continuing presence, aiming initially to:

- identify financial and human resources for the work
- identify further what information is already available, what information is needed by the various stakeholder groups and thence where the gaps are
- develop a strategy for meeting those information needs, including:

Research: e.g. commissioning research on the 'lifetime' (as opposed to capital) costs of beds/equipment in use; and evaluation studies of items of equipment

Development: e.g. developing an interactive database for user feedback; other methods for systematically collating feedback on equipment; encouraging resolution of design problems; and making available such feedback to help those purchasing equipment

Publicity: e.g. ensuring that all stakeholders are informed about the value of effective purchasing; ensuring that information about user needs is available to all who need it.

Fragmentation of existing information flows hampers all involved

Our work has highlighted the fragmentation and lack of regular means for co-ordination and collaboration between those involved in the design, manufacture and supply of health care beds, those who purchase them, and those who use them whether on behalf of organisations or individuals.

Although there are some good sources of information already in existence, they are partial in what they are able to provide, not widely known or easily available, and not updated frequently enough. There is no widespread and systematic way of gaining access to the experience of users who have detailed understanding of their own problems and concerns about existing designs, and ideas about what would help for the future.

A central, national resource, along with the will to use it, would help a wide range of people to make better decisions in this area.

Although this project was directly only concerned with health care beds and related equipment, many of the findings also apply to other forms of health care equipment, and

the forum might wish to consider extending the breadth of its coverage at a later stage along similar lines.

Initial composition of the forum

The forum could initially involve policy makers, service providers, service users from a range of backgrounds and needs, suppliers, manufacturers and designers, and existing organisations who do or would wish to collect and supply information about beds and related equipment.

Appendix A

Steering group membership

Ms Catherine McLoughlin CBE, Chair, Bromley Health Authority (Chair)

Dr John McClenahan, Fellow, King's Fund (Secretary)

Ms Barbara Vaughan, Director, Nursing Developments Programme, King's Fund

Prof. Bruce Archer (Design team, original King's Fund Bed Project)

Ms Pam Hibbs CBE (latterly Director of Nursing and Quality, Royal Hospitals NHS Trust)

Dr Muir Gray, Director of Research & Development, Anglia & Oxford NHS Executive

Mr Terry Hunt CBE, Chief Executive, NHS Supplies

Ms Joanna Bonomini, Tissue Viability Nurse Specialist, Royal Hospitals NHS Trust

Ms Michelle Kirkbride, Tissue Viability Nurse Specialist, St Mary's NHS Trust (Paddington)

Ms Pat McCann, Chief Executive, St Mary's NHS Trust (Paddington)

Mr Frank Jackson, Director of Resources, King's Fund

Prof. Colin Roberts, Head of Medical Engineering and Physics, King's College Hospital

Appendix B

The consultation process

The consultation process involved occupants, staff, informal carers, and a range of experts including manufacturers and suppliers.

The aim of the consultation was to discover the views and experience of as wide a range as possible of people with an interest in beds for health care.

Those we consulted fell into two broad groups:

- users (occupants and carers) and operators (staff and informal carers) of beds
- experts – e.g. clinical specialists, managers in hospitals and nursing/residential homes, representatives of agencies such as NHS Supplies, nursing home registration officers, bed manufacturers.

Our sample was not 'representative', but sought to encompass as wide a range of interested people, with as wide a range of experience as possible.

Service users included people who were, or had been, recipients of health care in a variety of settings and representing a range of conditions and disabilities, and carers. With the exception of residential homes for disabled people, we conducted interviews outside health care settings, making contact via 'patient' organisations (e.g. Multiple Sclerosis Society). Some were contacted via notices in the newsletters of such organisations. Most were interviewed in focus groups, though some were by telephone and some responded by letter.

Staff and informal carers were consulted individually or in groups. We attempted to get as wide a range of experience as possible, including a range of occupations from hospital, nursing/residential home and community settings.

We focused upon two broad areas of concern:

- what is the experience of occupants, staff and informal carers in using health care beds?
- what is the experience of occupants, staff and informal carers in choosing and/or purchasing beds for health care?

Most 'experts' were interviewed individually and their views sought on the issue of use and choice of beds in relation to their particular area of expertise. Manufacturers were consulted in a series of meetings held with members of the British Surgical Trades Association. Towards the end of the consultation period a one-day workshop was held, which brought together a wide range of expertise, including that of occupants. Its main purpose was to open the debate more publicly, discussing the process of selection of beds and the development of guides for purchasers. This provided further data about the selection process and, incidentally, more information about people's experience of beds, both as users and operators.

Appendix C

Organisations approached

The views of individuals and groups were sought through the following organisations. Views expressed by individuals may not necessarily represent those of their organisations.

Hospital and Community Trusts/NHS organisations

Addenbrookes NHS Trust
Bradford Hospitals NHS Trust
Brent & Harrow Health Authority
Causeway Health and Social Services NHS Trust, Coleraine
Central Sheffield University Hospital Trust
Chorley & South Ribble NHS Trust
City & Hackney Community Services NHS Trust
Community Health Sheffield NHS Trust
Cornwall Health Care NHS Trust
Derbyshire Royal Infirmary NHS Trust
Doncaster Health Authority
Gloucestershire Royal NHS Trust
Guy's and St Thomas' Hospital NHS Trust
Harringey Health Care NHS Trust
Homerton Hospital NHS Trust, London
Medway NHS Trust, Gillingham
NHS Confederation
NHS Supplies
Northern General Hospital NHS Trust, Sheffield
Nottingham City Hospital NHS Trust
Nottinghamshire Health Care NHS Trust
Oxford Radcliffe NHS Trust
Plymouth Hospitals NHS Trust
Rotherham General Hospitals NHS Trust
Royal Berkshire & Battle Hospital NHS Trust
Royal Free Hampstead NHS Trust
Royal Hospitals NHS Trust
Royal United Hospital Bath NHS Trust
Salisbury Health Care NHS Trust
Sheffield Health
Southampton Community Health Services NHS Trust
South Manchester University Hospitals NHS Trust
St Mary's NHS Trust, Paddington
Surrey Heartlands NHS Trust
University Hospital Birmingham NHS Trust
Victoria Infirmary NHS Trust, Glasgow
West Lancashire NHS Trust
Wrightington Hospital NHS Trust, Wigan

Private and charitable health care providers

Goldsborough Nursing Homes
King Edward VII Hospital for Officers, London
Leonard Cheshire Services in Sheffield
Palms Row Health Care
Sevenfields Residential Home, Sheffield
St Luke's Hospice, Sheffield
West Melton Lodge Nursing Home, Rotherham

Other organisations

British Council of Organisations of Disabled People
British Federation of Care Home Proprietors
British Surgical Trades Association
Consumers' Association
Cranfield Biomedical Centre, Cranfield University
Derbyshire Coalition for Disabled People
Disability Information Trust
Disabled Living Centres Council
Disabled Living Centres in Bristol, Cardiff, Leeds and Liverpool
Disabled Living Foundation

Family and Community Services Dept, Sheffield City Council
Forum of People with Disabilities, Sheffield
Health & Safety Executive
Institute of Occupational Medicine, Edinburgh
King's Fund Organisational Audit
Marks & Spencer, Head Office
Medical Devices Agency
National Care Homes Association
Newchurch and Company Ltd
Open Ergonomics Ltd
Red Cross, Leicester
Research Institute for Consumer Affairs
Robens Centre for Ergonomics Research, University of Surrey
Social Services Dept, Devon County Council
University of East Anglia School of Occupational Therapy and Physiotherapy

Professional organisations

Chartered Society of Physiotherapy
College of Occupational Therapy
Community & District Nursing Association
Royal College of Nursing
Tissue Viability Society

'User' organisations

Arthritis Care
British Polio Fellowship
Motor Neurone Disease Association
Multiple Sclerosis Society
Muscular Dystrophy Association
National Ankylosing Spondylitis Society
National Back Pain Association
Parkinson's Disease Society
Relatives Association
Scope
Spinal Injuries Association

Manufacturers

Bakare Beds Ltd
Doherty Medical Ltd
Egerton Hospital Equipment Ltd
Huntleigh Nesbitt Evans Ltd
Scan Mobility Ltd
Sidhil Care Ltd
Support Systems International

Appendix D

Whom we consulted

Focus groups

We ran user focus groups consisting of:

- people with:
  - ankylosing spondylitis
  - arthritis
  - multiple sclerosis
  - back pain
- people who have had:
  - cardiac surgery
  - strokes (and their carers)
- people who live in residential homes for elderly people
- people who live in residential homes for disabled people
- mothers of children with cerebral palsy
- relatives of people in nursing and residential homes.

We also ran focus groups including people from the following occupational groups:

- district nurses
- hospital nurses
- physiotherapists (hospital, community and rehabilitation centre)
- occupational therapists (hospital, community and rehabilitation centre)
- doctors (senior registrars)
- hospice nursing, care and therapy staff
- nursing and residential home care staff
- hospital porters
- hospital domestic staff
- rehabilitation assistants in a rehabilitation centre.

Individual consultation

We spoke with people from the following occupational groups:

- back care advisers
- biomedical engineers
- commissioning nurses
- designers
- disabled individuals
- equipment loans stores managers and staff
- ergonomists
- heads of nursing home inspection units
- health & safety risk managers

- hospital and community supplies managers
- infection control specialists
- maintenance managers
- manual handling co-ordinators / trainers
- midwives
- nurse managers
- nurses
- nursing home proprietors and managers
- occupational therapists
- physiotherapists
- residential home proprietors and managers
- staff of Disabled Living Centres
- supplies managers
- tissue viability specialists.

Workshop

We ran a one-day workshop attended by people with a wide range of expertise, who are involved in choosing and using beds.

We would like to thank all of those who gave generously of their time and expertise to our investigation, who are too numerous to mention individually.

In the 1960s, the King's Fund caused a major stir when it developed a new specification for hospital beds. Manufacturers implemented the specification as the 'King's Fund bed', which was revolutionary in its time and a major step forward in patient care.

Today, more than 30 years later, the bed – large, solid and built to last – is still in widespread use throughout hospitals and other health care organisations in the UK. However, our research shows that modern requirements can no longer be met by a single basic specification – better beds are now needed, not only in hospitals, but also in the community and in nursing and residential homes.

This unique study looks at why high quality beds are an essential part of improving patient care. It explains what matters in choosing the right bed in different circumstances and includes recommendations for change in policies, management and practice.

Better Beds for Health Care is essential reading for anyone who is involved in the selection, design, manufacture or supply of beds; and also for patients and their carers.

More detailed practical advice is contained in a series of three King's Fund publications:

Choosing Beds for Hospitals: A guide
Choosing Beds for Nursing and Residential Homes: A guide
Choosing Health Care Beds for Use at Home: A guide for users and professionals

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