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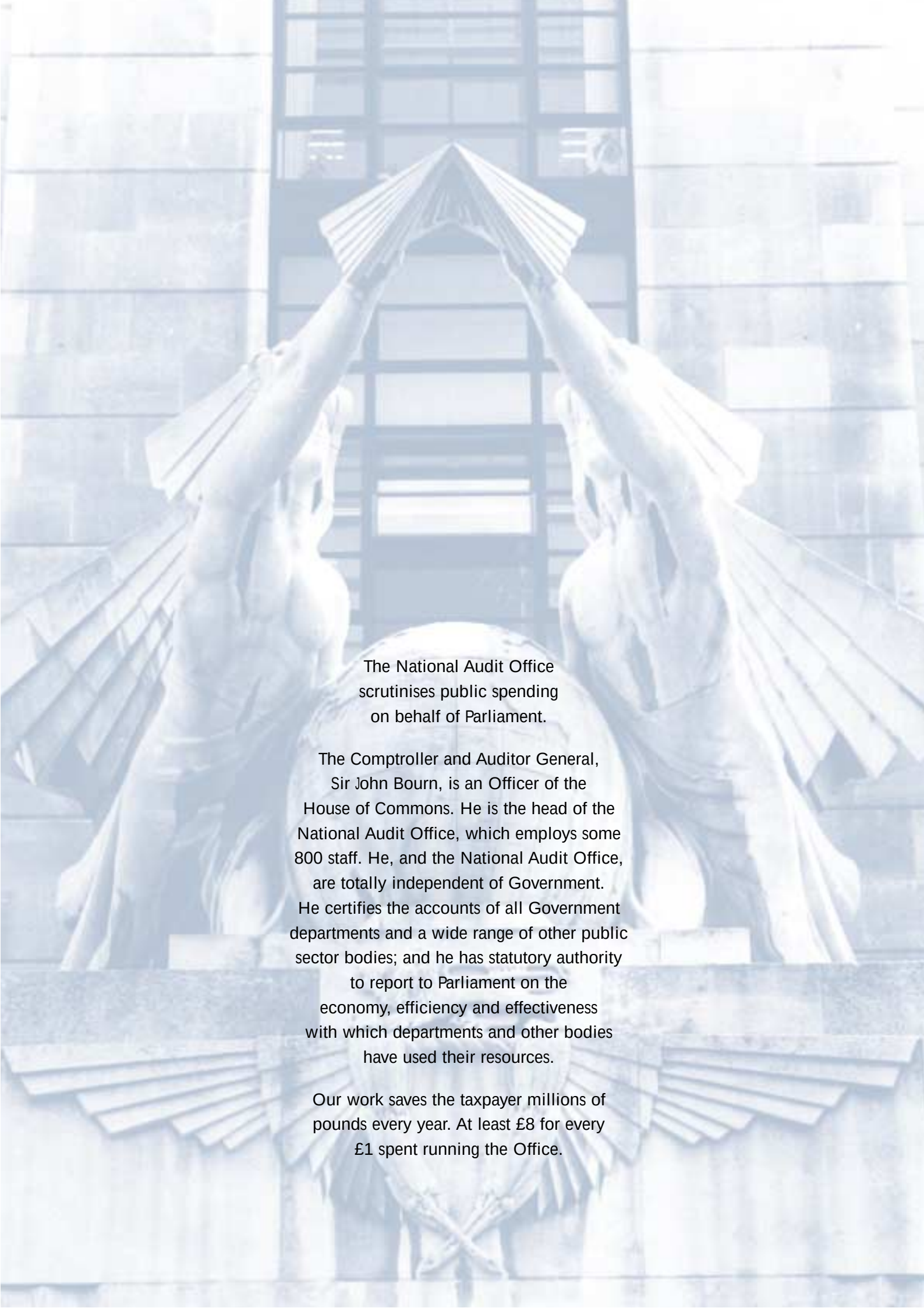
Hip replacements: an update

REPORT BY THE COMPTROLLER AND AUDITOR GENERAL
HC 956 Session 2002-2003: 17 July 2003



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John Bourn
Comptroller and Auditor General

National Audit Office
9 July 2003

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Background

1 Hip replacements are one of the most common and most effective major surgical procedures performed in the NHS. Over 43,000 are carried out each year bringing mobility and relief from pain.

2 In April 2000 we published a report on elective hip replacements drawing attention to a number of areas - including the effectiveness of hip prostheses - where there was scope to improve the efficiency and effectiveness of the procedure, and the quality of care to patients. Our report, and the subsequent report by the Committee of Public Accounts, made a number of recommendations for improvements. **Figure 1 on page 11** provides detail on these and on progress to date. Since then there have been a number of key developments, including the launch of a National Joint Registry, and the publication of guidelines on the standard of hip prostheses to be used in the NHS. This report provides an update on elective hip replacement in the NHS, three years on.

Overall conclusions

3 Effectiveness of hip prostheses is a key issue, having a major impact on patient outcomes. The National Joint Registry will be a valuable resource for assessing effectiveness. We look forward to the point where it will provide usable results. In the meantime, we welcome the guidance issued by the National Institute for Clinical Excellence. Ninety per cent of consultants now use these but the remainder are still using prostheses for which they have no adequate evidence of effectiveness.

4 Since our last report there has been significant progress in achieving recommendations made by the Committee of Public Accounts in their report of December 2000, including the establishment of a National Joint Registry and reducing length of stay for patients. In respect of other Committee recommendations the Department of Health and others have put in place arrangements to secure improvements, such as the work of the Modernisation Agency on care pathways, and that of the NHS Purchasing and Supply Agency on benchmarking the price of hip prostheses. It will, however, take time for these and other initiatives to fully take effect, and more remains to be done to ensure an increased level of quality of care to patients, and to improve efficiency and effectiveness. Recent and forthcoming developments such as the

NHS Purchasing and Supply Agency's guidance on which hip prostheses meet National Institute for Clinical Excellence guidance should however mean that further improvements will be realised in due course.

5 But there is still progress to be made and some ground to be covered. For example, fewer trusts have policies for introducing new prostheses, and a fifth of surgeons still only follow up their patients' progress for one year after their operation. In addition, some consultants still perform few hip replacements and therefore may not be able to maintain their expertise, while information given to patients is not always adequate. The average wait for an operation once a patient is seen by a consultant for assessment remains at 8 months, and while this is substantially below the NHS target of a 12 month maximum waiting time, it is to be hoped that ongoing work within the NHS to reduce waiting times will lead to improvement.

6 Strong leadership within hospitals is the key here. Overall, a number of the issues, and particularly both the absence in some trusts of policies for trialling new prostheses and complete adherence to the National Institute for Clinical Excellence guidelines on choice of hip prostheses, are risks to patient outcomes. They place a question mark over how effectively some trusts are managing them.

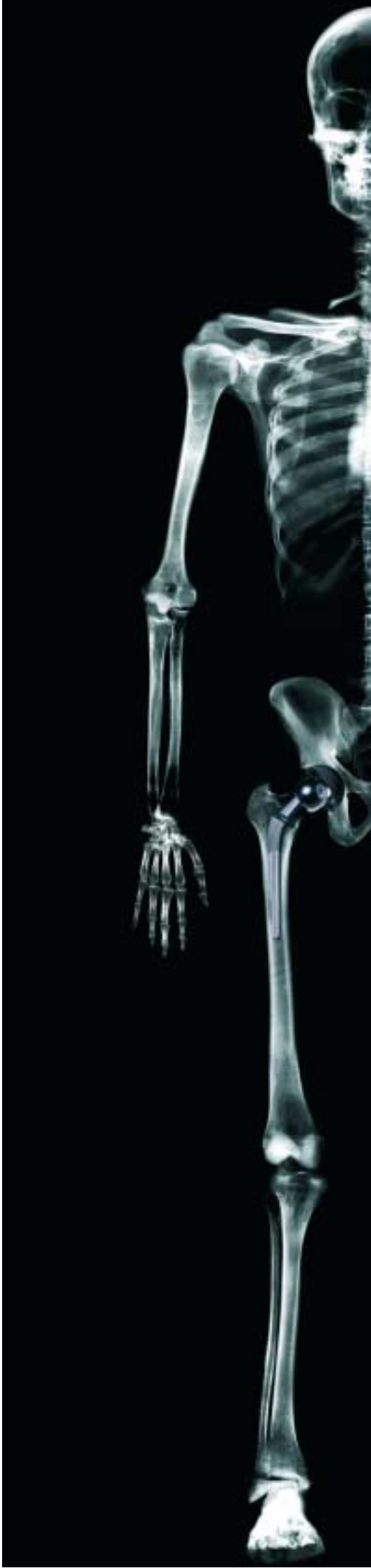
Effectiveness of hip prostheses

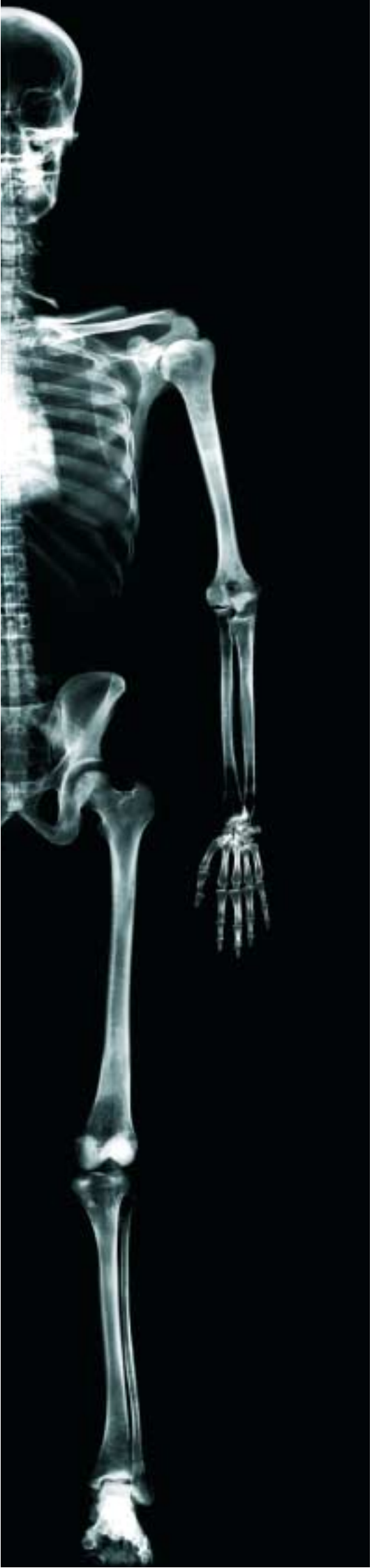
7 There are currently some 64 hip prostheses on the UK market, many of which do not have evidence of long-term effectiveness, often because they are of recent development. In April 2000 the National Institute for Clinical Excellence published guidance for a minimum standard of evidence of effectiveness which should generally be applied to hip prostheses used in the NHS.

8 The majority of consultants have got published evidence of effectiveness for the prostheses they use most often. However 11 per cent of consultants do not, and 13 per cent either do not know whether the prostheses they use meet the National Institute of Clinical Excellence standard, or say that they do not.

9 In Sweden there has been a national hip registry since 1979, and for many years there has been widespread support for a UK registry. The Committee of Public Accounts recommended that one should be established. Benefits include effective monitoring of hip prostheses, early identification of problems, and improved tracking of patients.

10 In July 2001 the Department of Health announced a National Joint Registry for hip and knee replacements for England and Wales. Questions over its funding delayed the start. It was launched on 1 April 2003 but participation is voluntary. It is self-financing, with NHS trusts paying a £25 levy for each prosthesis they purchase - over £1.075m a year for hip prostheses. The National Joint Registry is the only major national registry not to be funded by central government. Prosthesis manufacturers, who benefit significantly from the data available from the Registry, do not contribute to its cost, but are paid an administrative charge of some £107,500 each year in respect of hip prostheses for the first two years, and less thereafter, for collecting the levy from trusts.





11 The Medicines and Healthcare products Regulatory Agency remains concerned that a significant number of consultants are not reporting problems with hip prostheses even though the overall level of reporting has improved. The Agency continues to take action on a number of fronts to improve awareness of the need to report adverse incidents.

12 Over a third of trusts told us that manufacturers offer them incentives for the introduction of new prostheses. This is of particular concern as only some 20 per cent of trusts have a policy on trialling new hips (down from about a third in 2000) and the risk is that incentives may become an undue influence on purchasing decisions.

13 Some 9 per cent of consultants who responded told us that they accepted incentives from manufacturers for the introduction of new prostheses - mainly free overseas travel for training. The Department of Health has issued guidance requiring such commercial sponsorship to be registered and appropriately approved. However we found that only about a third of accepted incentives were properly registered and 10 overseas trips were not approved at all. This raises some concerns about the transparency and public accountability of commercial sponsorship arrangements at some trusts.

Improving the quality of patient care

14 The decision to perform hip replacement surgery involves clinical judgement in respect of factors such as age and weight. Our earlier report found variations in how criteria such as these are applied and it remains the case that equity of access cannot be fully demonstrated.

15 At the time of our October 2002 survey, patients waited on average three and a half months to see a consultant, and then a further 8 months before admission to hospital. One of the key factors influencing waiting time is the number of consultants. At 31 March 2002 there were 1,303 orthopaedic consultants in post. According to the Department of Health's current supply projections, there may be sufficient trained specialists to increase numbers in trauma and orthopaedic surgery to around 1,470 by September 2004.

16 We found that 10 per cent of orthopaedic consultants surveyed[1] prioritise their patients mainly on the basis of the need to meet waiting time targets rather than in terms of clinical priority. The British Orthopaedic Association found that in March 2001, 52 out of 100 orthopaedic units that responded to a survey had been asked to operate on long waiting time patients at the expense of more clinically urgent cases.

17 Integrated care pathways are a means to improved quality of care and reduced length of stay; and we welcome the efforts being made by the Modernisation Agency to disseminate good practice in this area. The number of trusts using integrated care pathways has increased to around 50 per cent from 29 per cent in our earlier report, but while some variation is to be expected, the pathways vary significantly in size and scope. This indicates the opportunity for further spreading of good practice, including in ensuring the effective discharge of older patients[2].

1 Appendix B sets outs the detailed methodology.
2 *'Ensuring the effective discharge of older patients from NHS acute hospitals'*, National Audit Office Report, (HC392, 2002-3).

18 In its December 2000 Report, the Committee of Public Accounts expressed concern about a possible link between surgeon skills and experience and the effectiveness of hip replacement operations. A Royal College of Surgeons investigation found no link between grade of surgeon and clinical outcomes. However US evidence indicates a link between volume of operations carried out and outcomes. The position has changed little since our earlier report. Around 10 per cent of surgeons do 10 or fewer operations per year.

19 Almost all trusts now provide patient information, but some do not provide specific information on hip replacement and others vary in terms of the quality and scope of the information provided.

20 Three quarters of consultants have access to infection data. Evidence suggests that rates of infection are higher than British Orthopaedic Association standards, and there is therefore scope for improvement. The National Audit Office is currently undertaking a detailed examination of hospital acquired infection. Whilst there have been improvements in the frequency and period during which consultants follow up their patients after a hip replacement, some 20 per cent told us they do not do so for as long and as often as they think appropriate, mainly because of shortage of time or pressure to meet waiting list targets.

Value for money in hip surgery

21 The Department of Health has taken a number of positive steps to improve value for money in hip surgery, particularly through the Orthopaedic Services Collaborative and the Action on Orthopaedics programme. In addition, the proposed new Diagnosis and Treatment Centres have the potential to make a significant difference. But there is more that can be done.

22 The number of consultants who told us that 25 per cent or more of referrals to them by general practitioners were inappropriate has increased since our earlier report from 6 to 10 per cent. This imposes an unnecessary burden on patients and wastes NHS resources.

23 The cost of hip replacements varies widely across trusts (on average £4,300 but ranging from £2,000 to £8,000) partly as a reflection of the complexity of cases. Some trusts have benchmarked costs but there remains scope to do more. To date, only 1 in 4 trusts has used the NHS Purchasing and Supply Agency benchmarking service for hip prostheses, though others have taken a variety of steps to reduce costs.

24 Patient length of stay is an important issue for both patients and trusts, and it is encouraging that for hip replacements it has decreased significantly since our last report - to 8 days for a primary hip. Many consultants believe there is scope for further reduction consistent with clinical needs, and this could have a significant impact in terms of increasing the number of patients treated (Figure 15).

Recommendations

25 Hip replacements are common and effective - a 'benchmark' procedure that can dramatically change people's lives. The Department of Health and the orthopaedic community have taken steps to improve hip replacement services. Other changes will be coming on line that will also make a difference. Our review found much good work, but there is still some way to go to meet the concerns addressed in our earlier report in April 2000 and that of the Committee of Public Accounts in December 2000 (Figure 1). In this context we make the following recommendations.

The Department of Health should:

a in collaboration with the British Orthopaedic Association, and building on recent work by the Modernisation Agency, develop:

i) templates for an integrated care pathway for primary hip replacement;

ii) guidelines on recommended length of stay for hip replacement patients with no complicating factors; and

iii) patient information for hip replacement patients;

b develop guidelines to minimise the inequity in access to treatment by NHS consultants, building on the National Service Framework for Older People benchmarking tool.

NHS acute trusts should:

c in the interests of good clinical governance:

- develop protocols in the light of guidance by the NHS Purchasing and Supply Agency to ensure that, wherever suitable, consultants use prostheses that conform to the National Institute for Clinical Excellence guidance. And that where other prostheses are used there are solid clinical grounds for doing so in each case;
- draw up a policy for trialling of new prostheses if they have not already done so;
- evaluate the risks involved with consultants who carry out few hip replacements and put in place procedures to manage such risks. These procedures could include regular independent or peer reviews of surgeon performance, by monitoring infection rates and other clinical outcomes of surgery;

d consider scope for reducing the cost of their prosthesis purchasing, using the services of the NHS Purchasing & Supply Agency;

e put in place arrangements for verifying that all consultants are complying with the NHS guidance on commercial sponsorship;

f monitor length of stay for hip replacement patients and take steps to reduce it where appropriate and compatible with high quality patient care. Measures taken to reduce length of stay could include admission on day of surgery and earlier discharge planning, introduction of an integrated care pathway and regular audits of variances between the pathway and what actually happens, and informing patients about their expected length of stay at their pre-admission assessment;

g work together with primary care trusts to identify referral routes for patients with hip conditions to health professionals other than consultants, who can assess, diagnose, treat and refer on the patients, to reduce inappropriate referrals from general practitioners and allow greater time for consultants to follow up patients after surgery. This should build on the work of the Modernisation Agency in promoting the use of scoring systems and greater provision of care by General Practitioners; and take account of the National Institute for Clinical Excellence referral advice on osteoarthritis;

h maintain records and monitor infection rates following hip replacements for all consultants, taking action where unusually high rates are found. This would include identifying to what extent the infections can be attributed to the practice of the consultant, or the systems in place in the hospital.

Primary care trusts should:

i ensure that the need to meet NHS Plan targets for reducing waiting times for hip replacement surgery is taken fully into account in financing and resourcing decisions.

The Commission for Health Improvement should:

j ensure that their annual work programme includes examining, at an appropriate sample of trusts, whether National Institute for Clinical Excellence guidance on hip prostheses is being appropriately complied with, and whether trusts maintain and actively monitor registers for commercial sponsorship;

k include, in their clinical governance reviews, the equity with which patients are offered hip replacements, the prioritisation of patients on NHS waiting lists, and the use of integrated care pathways.

The Medicines and Healthcare products Regulatory Agency should:

l examine what further steps can be taken to encourage orthopaedic surgeons to report all notifiable incidents concerning hip prostheses to them.

Figure 1

Areas for improvement in 2000 and progress to date

	PAC recommendation (December 2000)	Progress to date (paragraph where the issue is discussed in the report)
	On the need for better control over the selection, introduction and use of hip prostheses	
1	Monitor the implementation of National Institute for Clinical Excellence guidance on the use of hip prostheses.	The Commission for Health Improvement has responsibility for this. Limited testing of compliance to date. (Paragraph 2.4)
2	NHS trusts need to review their selection of hip prostheses with controls over introduction and use.	Fewer trusts now have policies for the introduction of new prostheses than in 1999. (Paragraph 2.16)
3	The case for a national register is compelling.	A contract to run the Registry was signed in November 2002. It was launched on 1 April 2003. (Paragraph 2.8)
4	Patients should be informed when a new type of prosthesis is used as part of a clinical trial.	The majority of consultants always inform patients when they are part of a trial. (Paragraph 2.17)
	On improving the quality of care to patients requiring total hip replacements	
5	Increased numbers of orthopaedic surgeons should reduce waiting lists, and there is a need to ensure greater consistency of access on grounds of age or weight.	At March 2002, there were 1,303 orthopaedic consultants in post. According to the Department of Health's current supply projections, there may be sufficient trained specialists to increase the numbers in trauma and orthopaedic surgery to around 1,470 by September 2004, (with additional measures to meet the NHS Plan targets). (Paragraph 3.6) There are still variations in the age and weight below and above which consultants feel that surgery may not generally be appropriate. These variations may point to a lack of clinical consensus with associated differences in the availability of hip replacement surgery. The National Service Framework for Older People has developed a benchmarking tool to address the potential problem of age discrimination including in the provision of hip replacement surgery. (Paragraph 3.2)
6	There is a lack of authoritative evidence about the link between surgeon skill and experience and effectiveness of hip replacements.	A Royal College of Surgeons investigation concluded that there was no evidence of a link between clinical outcomes and grade of surgeon. US evidence indicates a link between outcomes and the volume of operations carried out. Sixty five per cent of NHS consultants carry out 50 or fewer primary hip operations per year. The National Joint Registry will, in due course, provide feedback on surgeon performance. (Paragraph 3.14)

PAC recommendation (December 2000)	Progress to date (paragraph where the issue is discussed in the report)
7 The average lengths of stay for patients after hip operations are too long.	There has been a decrease in length of stay for both primary and revision surgery but there is scope for further reduction without adverse effect on patients. (Paragraph 4.10)
8 Less than half of consultants maintain accurate infection data.	Just over a third of consultants that responded to our survey questionnaire provided information on their infection rates. But many of these rates were based on low volumes of operations, and overall it was not possible to derive a reliable average infection rate. However, the rates available from the Nosocomial Infection National Surveillance Service suggest there is scope to reduce rates. More importantly the responses indicate the need for a more comprehensive surveillance in orthopaedic surgery. The National Joint Registry has recorded data on infection since April 2003. (Paragraphs 3.15-3.17)
9 The NHS Executive needs to be more proactive in ensuring that standards for patient follow up are set and monitored.	Clinical governance arrangements in trusts should ensure standards for patient follow up are set and enforced. (Paragraph 3.18)
10 The NHS Executive needs to do more to encourage the use of care pathways, and to provide good practice guidance.	The Modernisation Agency has undertaken two programmes to improve performance in orthopaedic services including the design of integrated care pathways. (Paragraph 3.9)
On the procurement of hip prostheses	
11 Inducement must not run counter to the patient's interest, and cash payments to individual clinicians are not acceptable.	Nearly 60 of the 650 consultants who responded to our survey said that they had accepted incentives, mainly in the form of overseas travel for training purposes. We found a number of cases where benefits were not properly registered or approved. (Paragraph 2.20)
12 The new NHS Purchasing and Supply Agency has a key role to play in securing greater economy by providing trusts with better intelligence on prices and discounts.	A prosthesis price benchmarking service has been available to trusts since 2001, but has been used by only around 1 in 4 trusts. (Paragraph 4.6)
13 There are wide unexplained variations in the costs of hip replacements and lack of management data.	Cost variations still exist though their range has decreased. (Paragraph 4.5)

Sources: Based on Committee of Public Accounts 43rd Report, Session 1999-00, and responses to our September 2002 survey of NHS acute trusts.

figure 1

Part 1

Background and introduction

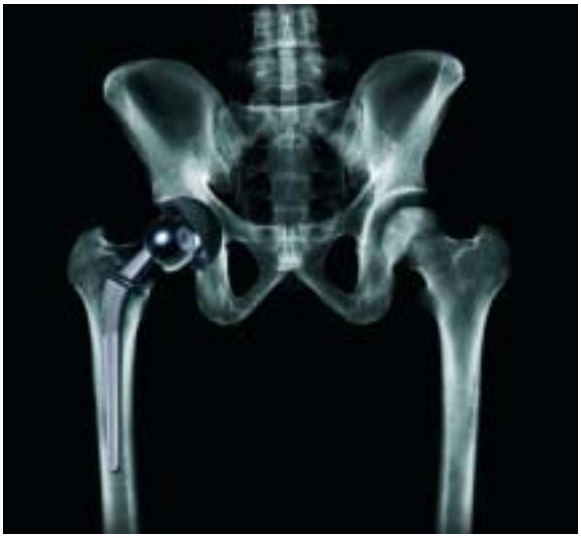
1.1 In April 2000, we published a report[3] on the effectiveness of hip prostheses and the design and organisation of hip replacement procedures. The Committee of Public Accounts subsequently made recommendations[4] to improve effectiveness for patients needing elective hip replacement, including establishing a national hip registry. This report provides an update on progress three years on. It is based on surveys of NHS acute trusts in October 2002, interviews with key stakeholders and advice from leading experts in the field (See Appendix B for details on methodology).

Hip replacement

1.2 The hip is a ball and socket joint in which the head of the thigh bone sits in the socket of the pelvis. Hip replacement is most typically required when arthritis causes severe pain and disability. It is one of the most effective and commonly performed procedures in the NHS, with some 43,000 primary hip replacements carried out annually. Hip replacement involves replacing the femoral head of the thigh bone and the socket with an artificial prosthesis. The rounded head of the femur is cut away and replaced with a metal or ceramic ball joint, which is usually fixed in place with bone cement. A cup is fixed into the socket, and the ball joint inserted **(Figure 2)**.

1.3 Most hip replacements last 10-15 years after which they need to be revised, with the original prosthesis being replaced - a more difficult procedure which carries a higher degree of risk. Post operative complications may result in earlier revision. There are some 64 hip prostheses provided by 16 different companies[5] currently available for surgeons to choose from, not all of which have long term evidence of effectiveness.

2 A total hip replacement



The roles of key players in the provision of hip replacement services

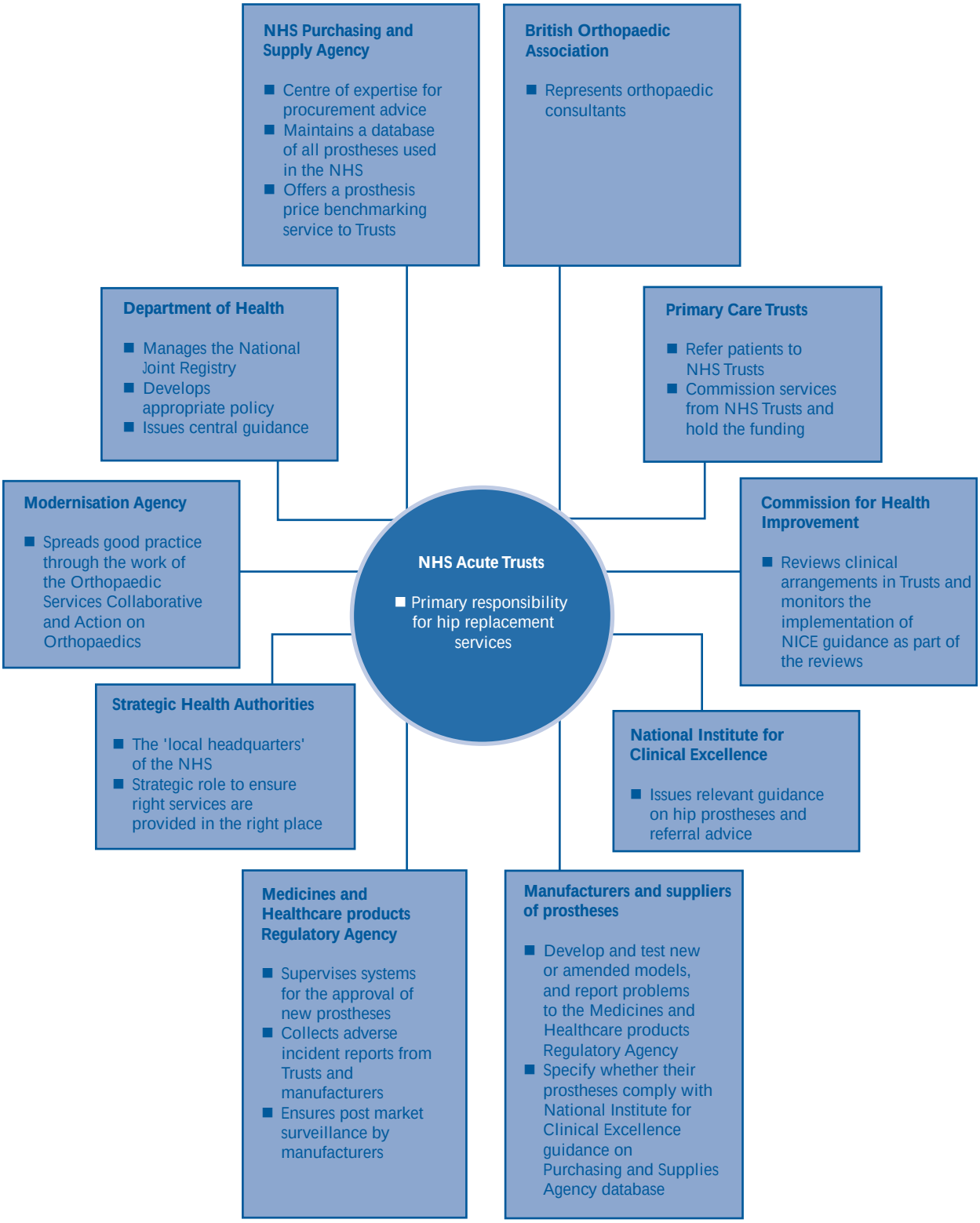
1.4 There a number of key stakeholders in hip replacement services illustrated in **Figure 3 overleaf**.

Main developments

1.5 The main developments since the publication of our first report in April 2000 and the Committee of Public Accounts Report in December 2000 are:

3 *'Hip replacements': Getting it right first time (HC417, 1999-2000).*
4 *Committee of Public Accounts, 43rd Report of Session 1999-2000.*
5 *Comparative figures from 2000 NAO report: 62 prostheses manufactured by 19 different companies.*

3 Roles of key players



Source: Department of Health

- in April 2000 the **National Institute for Clinical Excellence** published a benchmark for the selection of hip prostheses by consultants[6]. This set a standard of a revision rate of 10 per cent or less after 10 years[7], to be used as the basis for using prostheses in primary hip replacement. In December 2001 the Institute also published referral advice for general practitioners on osteoarthritis of the hip and knee.
- from 1 April 2000 the **NHS Purchasing and Supply Agency** took over functions previously carried out by NHS Supplies. In September 2000 the Agency published an online database of hip prostheses with information from manufacturers on whether they met the National Institute of Clinical Excellence benchmark. The Agency has set up an evaluation panel to validate manufacturers' claims independently. From August 2003 a list of prostheses which the panel believes meet the Institute's benchmark will be available. The Agency have provided a benchmarking service since late 2001, which enables trusts to compare prices charged by manufacturers for hip prostheses.
- following a recommendation from the Committee of Public Accounts, the Department of Health announced in July 2001 the launch of a National Joint Registry for hips and knees. The Registry became operational on 1 April 2003.
- the Department of Health commissioned the Modernisation Agency to develop two initiatives focused on identifying and spreading good practice in orthopaedics as well as improving equity of access on grounds of age and other criteria. The *Orthopaedic Services Collaborative* has involved about 65 per cent of trusts in learning sessions to share good practice. *Action on Orthopaedics*, launched in July 2000, aims to demonstrate improvements in patient care, including through the use of care pathways, and to spread best practice. The programme has funded 17 pilot sites, and joint *Action On* and *Collaborative* guidance was published in January 2003 based on the results of the pilots and the Collaborative work[8].

6 *Guidance on the Selection of Prostheses for Total Hip Replacement (Technology Appraisal Guidance No 2).*
7 *Or, for newer prostheses, an 'entry' benchmark of 3 years minimum experience consistent with the 10 per cent benchmark.*
8 *Improving orthopaedic services: A guide for clinicians, managers and service commissioners.*

Part 2

Effectiveness of hip prostheses

Most consultants use prostheses for which they have published evidence and which meet National Institute for Clinical Excellence guidance, but more than one in ten do not

2.1 In 2000 we reported that a significant number of consultants were using prostheses for which they had no evidence of effectiveness. In April 2000, the National Institute for Clinical Excellence published guidance setting a benchmark for the effectiveness of hip prostheses which, though not compulsory, orthopaedic consultants are expected to take fully into account in choosing which hip prosthesis to use.

2.2 The standard is that after 10 years of use, 10 per cent or less of hip replacements using that prosthesis will have been revised. For newer prostheses, the requirement is that there should be at least 3 years of experience during which performance will be consistent with the 10-year standard. Nearly all consultants responding to our survey had seen the guidance, and the majority found it helpful. However, only a quarter of trusts reported that they restrict their prostheses purchased to those that conform to the Institute's guidelines.

2.3 In our original study we found that 14 per cent of consultants used prostheses for which they had no published evidence of effectiveness. There has been a slight improvement since then. Eleven per cent of consultants in our October 2002 survey had no published evidence on effectiveness for the prosthesis they used most and 13 per cent (including some of whom who had no published evidence of effectiveness) said either that their prosthesis of choice did not meet the National Institute for Clinical Excellence guidance or that they did not know whether it did.

2.4 The Commission for Health Improvement is responsible for monitoring the implementation of National Institute for Clinical Excellence guidance across the NHS. By November 2002, the Commission had carried out three reviews of trusts which included looking at hip replacement services, and commented on compliance with the guidance on hip prostheses in two of them. The Commission reported that implementation of the guidance was weak in orthopaedics in one trust. In the other it relied on the trust's assurance that the guidance had been implemented.

2.5 Only 1 in 6 consultants had seen the information on hip prostheses published by the NHS Purchasing and Supply Agency, giving manufacturers' views on whether their prostheses meet the National Institute for Clinical Excellence benchmark. Among those who had seen it, there was some uncertainty about the reliability of the manufacturers' information. From August 2003, the Agency is expecting to make available a list of prostheses that meet the Institute's benchmark, providing scope for more trusts to restrict their purchasing of prostheses to those that meet the guidelines.

A National Joint Registry is likely to bring significant benefits, at a cost to NHS trusts of around £1.6 million a year

2.6 Both our and the Committee of Public Accounts' report recommended the establishment of a National Joint Registry. The National Institute for Clinical Excellence and the Royal College of Surgeons and the British Orthopaedic Association also supported this proposal. The benefits of a Registry include better monitoring of the performance of implanted prostheses, enabling early identification of those that perform well or poorly; easier identification of patients receiving specific prostheses - should follow up be needed; and tracking of data on surgeon volumes and outcomes.

2.7 Following extensive consultation, the Department of Health announced, in July 2001, the establishment of a National Joint Registry for hip and knee replacements. Uncertainty over its funding led to delays in further developments, but in February 2002 the process of selecting an organisation to run the Registry began. Eight organisations expressed an interest, of which four submitted bids (for the period September 2002 to March 2005), ranging from £2.1 million to £5.9 million. AEA Technology was awarded the contract in November 2002. Whilst their quotation of £3.9 million was not the lowest, the Department considered that they had put in the best bid to ensure the success of the Registry.

2.8 The contract with AEA Technology is to run until 31 March 2005, and the Registry went live on 1 April 2003. The initial set up costs of £715,000 (for the period September 2002 to March 2003) were met by the Department of Health, but from 1 April 2003 the Registry was self-financing. Information recorded in the Registry includes:

- details of the hip or knee replacement operation;
- patient information (with patient consent);
- surgeon details;
- information on the procedure; and
- make, model and other relevant data on the hip or knee prosthesis.

2.9 In the UK there is no legislative basis for compulsory implant registries. Reporting by clinicians is an aspect of good professional practice rather than a legal requirement. The new joint registry therefore operates on a voluntary basis, and while coverage may not be universal the Department believes that the data collected will be sufficient to produce useful and valid results. It covers the private sector as well as the NHS. Further details are at Appendix A.

2.10 Funding options for the Registry were either central Department of Health finance, a levy on manufacturers or a levy on trusts. Central funding was rejected on the grounds that the Registry was not of high enough priority. Prostheses manufacturers objected to paying a levy, despite there being significant advantages for them in having the data that the Joint Registry will provide. It was eventually agreed that the costs would be met by a levy on NHS trusts (of £25 per prosthesis purchased by them) and private sector hospitals. The Department acknowledges that this will add to cost pressures on trusts in the short term, but sees the Registry as a worthwhile investment to improve patient care. The National Joint Registry is the only major national hip registry internationally whose running costs are not met directly by central government.

2.11 Two options for collecting the trust levy were considered:

- AEA Technology collecting the levy directly from trusts, based on data entered on the Registry, for an annual administration charge of £66,000; or
- AEA Technology invoicing manufacturers who in turn would invoice trusts for an annual administration payment to manufacturers of £250,000, of which £107,500 would relate to hip prostheses.

2.12 The Department decided that invoicing manufacturers was a more reliable method of collecting the levy, even though it was the more expensive option. The Department subsequently decided that, on the grounds of financial control, they would invoice manufacturers rather than AEA Technology doing so. The Department has agreed to pay manufacturers an administrative charge of £2.50 per implant sold, to be taken from the trust levy, but it is unclear whether this is reasonable in relation to the likely additional costs to be incurred by manufacturers. The Department of Health told us that it will keep the working of the National Joint Registry under review.

The Department has taken a number of steps to improve the effectiveness of hip prostheses used in the NHS but there is more that can be done

Reporting to the Medicines and Healthcare products Regulatory Agency

2.13 The Medical Devices Regulations require hip prostheses to conform to specific requirements, including on safety and performance. The Medicines and Healthcare products Regulatory Agency has an important role in ensuring that hip prostheses conform with these Regulations, and in identifying problems in their use. In November 2002, the (then) Medical Devices Agency and its French counterpart jointly appealed to the European Commission for the reclassification of hip prostheses which, if accepted, will result in more stringent controls in the UK and throughout Europe.

2.14 The Medicines and Healthcare products Regulatory Agency requires manufacturers and trusts to report all incidents of prosthetic failure and aseptic loosening, and circumstances where the reason for revision surgery is unclear. Since our first report, the Agency has taken steps to improve surveillance and reporting, including issuing guidance on manufacturers' post market surveillance systems in September 2000, and providing on-line reporting since September 2001. All trusts now have a designated Medicines and Healthcare products Regulatory Agency liaison officer, responsible for co-ordinating their relationship. The Agency is currently planning a poster campaign to increase reporting.

2.15 We asked trusts and NHS consultants about when they would submit a report to the Agency. While the number of incidents reported by trusts continues to increase (55 in 2001-02), and trusts and consultants are clearer now about reporting requirements **(Figure 4)**, the Agency remains concerned that a significant number of consultants are failing to report notifiable incidents.

Introduction of new prostheses in trusts

2.16 Around a quarter of trusts told us they were involved in trialling hip prostheses either new to the trust or new to the NHS. But only some 20 per cent of trusts reported having policies for such trialling, compared with around a third in 1999. This poses a potential risk that some prostheses may be subject to trial without adequate consideration of the benefits and risks.

2.17 In 1999 70 per cent of all consultants told patients when the prosthesis they were using was part of a trial. Our 2002 survey showed an improvement with nearly all consultants now doing so.

2.18 Nearly half of trusts told us that manufacturers offer them incentives for the introduction of new prostheses that they would otherwise not purchase. Of these, nearly a third told us that these incentives influenced their purchasing. Manufacturers offer a range of incentives to encourage consultants to trial prostheses in their trusts.

4 Circumstances under which trusts and consultants would report problems with prostheses

	Reason for reporting	Consultants that would report (1999 survey)	Consultants that would report (2002 survey)
Consultants	Prosthetic failure	79%	81%
	Aseptic loosening	52%	62%
	Unusual or high failure rates	-	90%
	No circumstances	5%	1%
Trust	No circumstances	-	0%

Source: NAO surveys of acute trusts and orthopaedic consultants in 1999 and 2002

2.19 The Department issued guidance in 1993[9] setting out standards of business conduct for NHS staff; further guidance on commercial sponsorship[10] was issued in November 2000. The guidance makes clear that commercial sponsorship - which includes funding of staff, training, UK and overseas hotel and transport costs - should be transparent and publicly declared. In particular such sponsorship should be recorded in an official register of interests, usually held by trusts, and publicly available. For conference travel and accommodation costs approval for such sponsorship must be given at Chief Executive or Director of Finance level.

2.20 Nearly 60 consultants (9 per cent of those who responded) told us that they had accepted incentives from manufacturers. We asked these consultants for further details. Of the 41 responses, 30 confirmed that they had accepted incentives, most of which were in respect of international travel for training purposes **(Figure 5)**. Only 10 of the 30 benefits were recorded in a register; and of the 24 instances of travel and accommodation being provided, only one was appropriately approved. Thirteen were approved at lower levels but 10 were not approved at all. At East Sussex Hospitals NHS Trust one consultant received royalties for his involvement in the development of a hip prosthesis. He uses that prosthesis for 90 per cent of the hip replacements he undertakes, and receives a small royalty payment for doing so.

9 *Standards of Business Conduct for NHS Staff (Department of Health, 1999).*
10 *Commercial Sponsorship: Ethical Standards for the NHS (Department of Health, 2000).*

5 Incentives accepted by consultants

Incentive	Consultants who accepted the incentive	Number recorded in register	Who approved travel and accommodation sponsorship
Royalty for use of a particular prosthesis	1	Yes - 1	
Travel and accommodation for training (mainly overseas)	24	Yes - 8 No - 16	Chief Executive/ Director of Finance - 1 Medical Director - 1 Clinical Director - 8 Manager - 2 No-one - 10 Other - 2
Research funding (conditional on using a prosthesis that would not otherwise have been used)	2	Yes - 1 Not Known - 1	
Provision of instrumentation (for a prosthesis that would otherwise not have been chosen)	2	Yes - 0 No - 2	
Staff training	1	Yes - 1	

Source: NAO survey of consultants

Part 3

Improving the quality of patient care

There remain variations in access to surgery

3.1 In deciding whether or not, and when, to offer a patient surgery, consultants have to take account of a range of factors including age, lifestyle, other health conditions and fitness. Such decisions are a matter of medical judgement but, in 2000, the Committee of Public Accounts was concerned to see more consistency of approach.

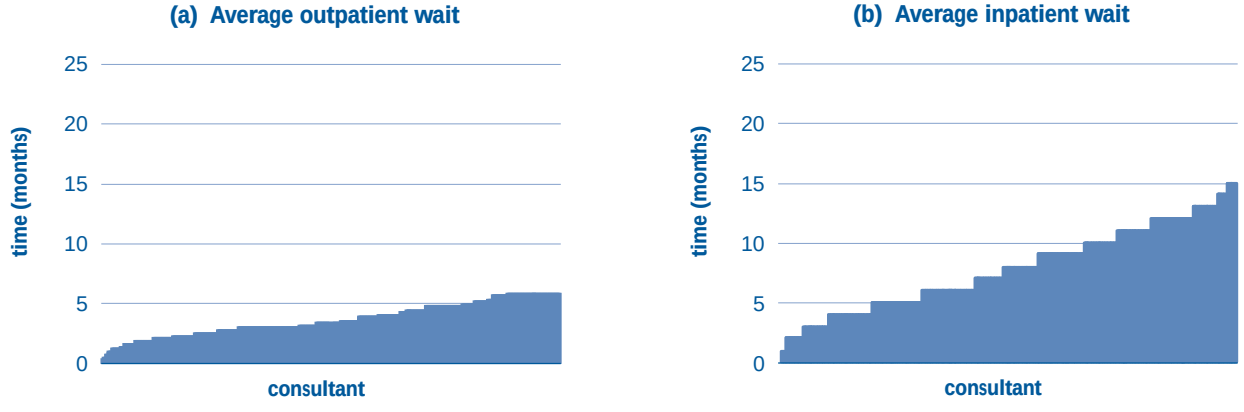
3.2 In 1999 we found variations in the age and weight below and above which consultants felt that surgery may not generally be appropriate. The position is unchanged in 2002. For example, the age above which consultants may not consider surgery is generally 90-95 though it ranges up to 100. The weight above which consultants may not consider surgery varies mainly from 100 kgs to 127 kgs (16-20 stones) but with a significant number extending the range to between 90 kgs and 150 kgs (14-24 stones). These variations may point to a lack of clinical consensus with associated differences in the availability of hip replacement surgery. The National Service Framework for Older People has developed a benchmarking tool to address the potential problem of age discrimination including in the provision of hip replacement surgery.

Waiting time for a hip replacement remains unchanged, and a significant minority of consultants prioritise patients mainly to meet waiting list targets

3.3 For patients waiting to see a consultant (outpatients) or for admission to hospital (inpatients) the time they have to wait is frequently a major concern. The NHS Plan, published in July 2000, sets targets for how long patients generally will wait to see a consultant and for surgery. The target for 31 March 2002 was for a maximum first outpatient appointment within 6 months, and a maximum inpatient appointment within 15 months. These maximum waiting times were reduced to 5 months and 12 months with effect from 31 March 2003. Almost all patients are seen within these targets.

3.4 **Figure 6** shows average outpatient (a) and inpatient (b) waiting times for each consultant that was able to provide the information. The average wait to see a consultant, as at October 2002, was three and a half months, and the average inpatient wait was 8 months. The total average wait from GP referral to surgery was

6 Average wait for an appointment as at October 2002



Source: NAO survey data (2002)

therefore nearly a year, excluding any tests or further assessment following the outpatient appointment. It is encouraging that the average inpatient wait was significantly less than the (then) target of 15 months. It remains the same as it was in 1999 however. Initiatives such as the development of Diagnosis and Treatment Centres (see Part 5) and the wider adoption of good practice we have identified should help to reduce waiting times.

3.5 It is a fundamental NHS principle that patients should be operated on in accordance with their clinical need. Most orthopaedic consultants do this, but an important minority mainly prioritise on a 'first come, first served' basis. Furthermore, 10 per cent of the 650 orthopaedic consultants who responded told us that they prioritise mainly on the basis of the need to meet waiting time targets. In addition, a survey in March 2001 by the British Orthopaedic Association found that 52 out of 100 orthopaedic units who responded to the survey had been asked to operate on long waiting patients at the expense of more clinically urgent patients[11], and a third of consultants told us that they would re-prioritise a patient to meet waiting time targets. **Figure 7** illustrates one way in which the Department of Health is helping trusts manage their waiting lists more effectively.

3.6 A key factor in waiting time for hip replacement is the number of trained orthopaedic consultants. By 2004, the NHS Plan states there will be 7,500 more consultants than in 1999. This target is not specialty-specific. At 31 March 2002 there were 1,303 orthopaedic consultants in post. According to the Department of Health's current supply projections, there may be sufficient trained specialists to increase numbers in trauma and orthopaedic surgery to around 1,470 by 2004. Further growth in consultant numbers will be supported by increases in training places; equally important is a focus on productivity (see Part 5).

7 Modernisation Agency's 'Clinically Prioritise and Treat' Project

The project aims to enable trusts to ensure patients are treated according to urgency and clinical need within NHS Plan maximum wait targets. It is based on the concepts that the proportion of 'urgent' patients impacts on 'routine' waiting times, and that displacing 'routine' patients on the waiting list can result in longer maximum waits.

Under the 'Clinically Prioritise and Treat' Project, trust waiting lists are profiled to illustrate the impact of patient urgency and reduced variation on maximum waiting times. Clinicians agree a waiting list profile, which is used as the basis for managing their waiting lists.

Source: Department of Health

More could be done to improve the quality of patient care

Over half of trusts derive important benefits from using integrated care pathways

3.7 Integrated care pathways mapping out a patient's journey whilst in hospital can have significant benefits for both the patient and the NHS. They are becoming increasingly common, and around half of trusts use them for patients undergoing primary hip replacement. Whilst this is an increase since our last report when we reported that 29 per cent of trusts used integrated care pathways, there is clearly some way to go before the Committee of Public Accounts' recommendation that care pathways should be used for all hip operations is realised. Benefits reported by trusts from using care pathways include improved and standardised clinical practice and quality of care, a better multi-disciplinary approach, more effective discharge planning, and reduced length of stay.

3.8 Integrated care pathways vary considerably in scope and detail, typically ranging from less than 20 pages to more than 60. Variations are to be expected but there are key elements common to most trusts that could and should be included in integrated care pathways.

3.9 The Modernisation Agency within the Department of Health has undertaken two programmes to improve performance in orthopaedic services including the design of integrated care pathways. The Orthopaedic Services Collaborative estimate that more than half of trusts have, or are developing, integrated care pathways. An example of good practice is at **Figure 8**, by the West Midlands 'Action On' programme - a local initiative to give guidance to participating trusts. Some of the key success factors in successful implementation of care pathways are listed at **Figure 9 on page 24**.

A low volume of hip operations by some surgeons remains a concern

3.10 In 1997 the results of a US study showed a significant relationship between a low volume of hip work carried out by individual surgeons and poorer outcomes. Their patients had higher mortality rates, more infections, higher rates of revision, more serious complications and longer length of stay[12]. A US study published in 2001 showed that surgeons with higher operation volumes tended to achieve a lower rate of dislocation following primary hip replacement with a lower rate of infection, and in revision surgery, a lower mortality rate[13].

11 A survey of BOA linkmen in March 2001. 100 hospitals responded.

12 Relationship between the volume of total hip replacements performed by providers and the rates of post-operative complications in the State of Washington - Journal of Bone and Joint Surgery, April 1997.

13 Association between hospital and surgeon procedure volume and outcomes of total hip replacements in the US Medicare population - Journal of Bone and Joint Surgery, November 2001.

8 An Integrated Care Pathway for Hip Replacements

Assessment and management of the patient in Primary Care

- Patient assessed using a locally agreed scoring system
- Treatment options discussed with patients and clinical investigations undertaken (eg. x-ray, blood count)
- Patient given non surgical treatment (advice, pain management) and referred to secondary care if appropriate
- All notes and medical records sent to treating hospital

Transfer to secondary care and outpatient consultation

- Patient triaged by specialist and further tests carried out
- Patient assessed by consultant
- Pre-admission assessment clinic booked
- Bed and theatre slot booked
- Patient and their home environment assessed by occupational therapist
- Detailed information about operation, hospital facilities, rehabilitation and discharge given to patient

Nurse led pre-admission assessment (3-6 weeks prior to planned operation date)

- Weight, height, Body Mass Index, blood pressure, blood count and glucose levels, urine, heart function and levels of MRSA infection recorded
- Expected length of stay confirmed with patient
- Full explanation of admission process and operative procedure given to patient
- Post-operative arrangements confirmed

Admission to hospital and operation (day before surgery or on day of surgery)

- Anaesthesia technique and pain management technique explained to patient
- Appropriate infection prophylaxis given to patient
- Site of operation marked on patient
- Operation performed using prostheses that meet National Institute for Clinical Excellence guidelines
- Patient and operation details entered on to National Joint Registry

Post-operative care and rehabilitation

- Removal of drain (24 hours/48 hours post operatively)
- Patient closely monitored to ensure no post operative complications
- Mobilisation programme initiated as soon as possible
- Discharge planning initiated
- Patient educated about exercises, precautions and self management

Discharge

- Patient information reinforced and patient provided with contact telephone number for advice
- Patient's medicines prepared in advance of discharge (to minimise delays to discharge)
- Follow up appointment arranged
- Patient transferred to intermediate care (day 5) and discharged by day 7
- Comprehensive discharge communication sent to GP within 24 hrs of discharge

Follow up and measurement of clinical outcomes

- First follow up appointment held 6-8 weeks after operation, then at 6/12 months
- Regular follow up appointments at least annually for life
- Clinical outcomes measured using a scoring system (eg. Oxford Hip Score)

Source: Total hip replacement pathway- produced through collaboration between Trusts in the West Midlands region

9 Key success factors for the successful implementation of an Integrated Care Pathway

- the organisation must be committed to the introduction of pathways;
- local commissioners must encourage their development;
- pathways should be part of the organisational quality improvement programme;
- pathway co-ordinators should have appropriate interpersonal and project management skills;
- there should be a rolling education programme to train staff on using pathways, and they must be given appropriate support;
- the pathway must be completed by all staff involved in patient care;
- collaboration must be undertaken between professional groups with a strong medical commitment, and there needs to be ownership of pathways by all clinical staff;
- pathways should be based on evidence and consensus of good practice and should include evaluation of outcomes; and
- deviations from the care pathway must be recorded and used to change clinical practice if appropriate.

Source: Sue Middleton and Adrian Roberts - Integrated Care Pathways: A practical approach to implementation

3.11 In the light of this and other available evidence BUPA (the UK's largest private healthcare provider) is seeking to introduce minimum numbers for primary and revision hip operations carried out by individual surgeons. BUPA has issued a discussion paper to the orthopaedic profession, and the results of this consultation will be relevant to practice in the NHS.

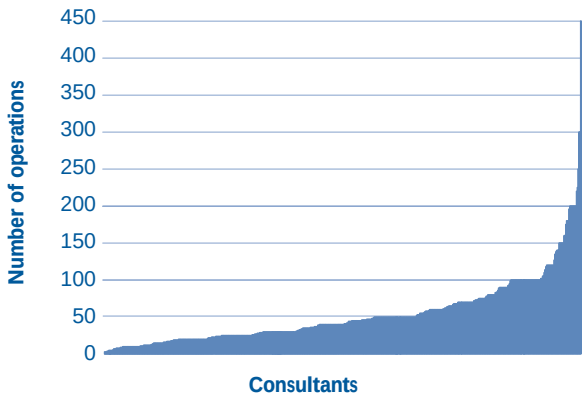
3.12 In 1999, we found significant variation in the number of primary and revision hip replacements performed annually by consultants, and the Committee of Public Accounts was concerned about a possible link between the skill and experience of the surgeon and effectiveness of the operation. One of the key recommendations of the Committee of Public Accounts was that the Department of Health should undertake research in this area. A Royal College of Surgeons investigation[14] concluded that there was no evidence of a link between clinical outcomes and grade of surgeon.

3.13 The position has changed little since 1999, with 65 per cent of consultants responding to our survey performing 50 or fewer primary hip replacements in 2001-02, and around 1 in 10 doing 10 or fewer a year **(Figure 10a)**. Almost all consultants doing more complex revision surgery perform 50 or fewer a year, and three quarters do 10 or fewer **(Figure 10b)**. These figures need to be interpreted taking into account those consultants who may not have worked a full year.

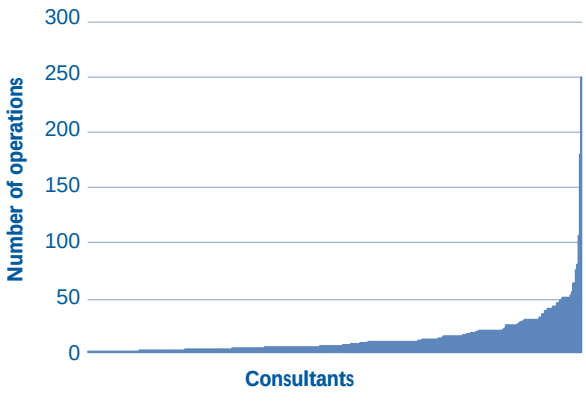
3.14 The National Joint Registry will in due course provide data to evaluate whether there is a link between the volume of operations performed by consultants and patient outcomes, and grade of staff operating and outcomes. In the meantime, whilst the evidence is unclear, trusts need to be aware of the potential risks and manage them accordingly.

10 Number of primary hip operations and revisions performed by consultants in 2001-02

(a) Number of primary hip operations performed by consultants in 2001-02



(b) Number of revisions performed by consultants 2001-02



Source: NAO survey data (2002)

14 *An investigation of the performance of the 3m Capital Hip System, July 2001. Royal College of Surgeons.*

11 Performing hip replacement surgery in a 'barn' operating unit

Since 1993, the Robert Jones and Agnes Hunt NHS Trust, a specialist orthopaedic hospital, has achieved a high throughput of arthroplasty work using a new style of operating theatre. The 'barn' is a large room in which four surgical teams can operate at any one time, and some of its key features include:

- four clean air enclosures and four anaesthetic rooms;
- a recovery ward;
- a store for sterile medical equipment; and
- glass walls in theatres so that medical staff can observe operations.

The 'barn' theatre has had a major impact on the quality of outcomes for hip replacement patients, including lower infection rates (~1%) for both primary and revision hip surgery. For any difficulties encountered during surgery, there is a team of experts on hand (surgeons, anaesthetists and nurse specialists) to offer support and advice, and complicated operations often involve two consultants. The 'barn' has also proved to be an excellent teaching environment, and the hospital is a 'centre of excellence' in orthopaedic surgery.

Although the initial capital outlay required to build the barn was significant, the running costs are comparable to those incurred in traditional NHS style operating theatres.

Source: The Robert Jones and Agnes Hunt Orthopaedic and District Hospital NHS Trust

Infection acquired in hospital

3.15 For patients undergoing a hip replacement the consequences of acquiring an infection in hospital can be very serious.[15] An infection is likely to result in increased length of stay, extra treatment costs, increased morbidity and may cause the new joint to fail. Guidance from the British Orthopaedic Association published in 1998 suggested that trusts should be aiming for an infection rate of between 1 and 2 per cent. About three quarters of consultants who replied to our survey confirmed that they had access to data on infection rates, but only half of these provided us with details of their infection rate. Many of these rates were based on low volumes of operations and overall it was not possible to derive a reliable average infection rate.

3.16 However, more comprehensive information published in the Nosocomial Infection National Surveillance Service report for the period 1997-2001[16] showed that out of 26,781 primary and revision hip operations there were 839 infections, an average overall rate of 3.1 per cent. The data showed also that infection rates for the 114 hospitals covered ranged from 0 to 10 per cent with an inter-quartile range of 2% to 5 per cent. This exceeds the British Orthopaedic Association standards in its guidance, suggesting there is scope for improvement. 'Barn' operating theatres have improved patient outcomes and reduced levels of infection in hip replacement surgery - **Figure 11** provides more detail.

3.17 The National Joint Registry has recorded outcome data and post-operative complications including joint infections relating to revision surgery since April 2003. There is however a need for more comprehensive evidence-based information on outcomes of orthopaedic surgery in trusts, and this issue will be examined further in our follow up study of the management and control of hospital acquired infection.

Following up patients after they leave hospital

3.18 As the Committee of Public Accounts noted in its Report, follow up of patients after hip surgery is essential to allow consultants to identify the need for revision surgery at an early stage. However, whilst the majority of consultants follow up patients for as long and as often as they think necessary, over 20 per cent of those who responded continue not to, mainly because of shortage of time or pressure to meet waiting list targets. Whilst there have been increases in the frequency and length of time over which follow up is carried out since our original report, there is clearly scope for further improvement through clinical governance arrangements in trusts, to ensure standards for patient follow up are set and enforced.

15 *National Audit Office Report: The management and control of hospital acquired infection in Acute NHS Trusts in England HC230 1999-00.*
16 *Nosocomial Infection National Surveillance Service report of surgical site infection in English hospitals 1997-2001 - PHLS.*

Patient information

3.19 Patient information is important in managing patient expectations and helping the patient make a speedy and safe recovery **(Figure 12)**. Almost all trusts provide information to patients prior to surgery, typically covering a range of issues including:

- treatment options;
- the pre-admission process;
- activity modification before and after the operation;
- trust facilities;
- the operation and post-operative procedures; and
- rehabilitation and discharge.

3.20 From our review of the patient information provided to us it is clear that both its content and quality vary. Some leaflets do not provide any specific information on hip replacement while others provide well designed and comprehensive information with helpful photographs. There is also no consistency in the additional information provided, with, for example, some trusts providing further leaflets on pain relief, pressure sores, general anaesthetic, compression treatment, hospital acquired infection and smoking, while many others do not. The Department has set up the Informed Patient Programme under which it intends to commission a range of high quality patient information on elective surgery procedures including hip surgery. The Department regard this as a priority and intend to address the issue of content and consistency of information available to patients.

12 Examples of patient information prepared by trusts

Part 4

Improving value for money

There are further steps the NHS can take to improve value for money in hip surgery

4.1 The Department of Health has taken a number of positive steps to improve value for money in hip surgery, particularly through the Orthopaedic Services Collaborative and the Action on Orthopaedics programme. In addition, the proposed new Diagnosis and Treatment Centres have the potential to make a significant difference, as discussed in Part 5. There is however more that can be achieved as set out below.

Referrals from general practitioners

4.2 General practitioners take decisions on which patients to refer to a consultant for a specialist opinion. In some cases this will be to confirm a diagnosis, in others to consider the patient for surgery, and in others to seek assurance that surgery is not necessary. Consultant time is a scarce resource, and it is important that patients are referred to them appropriately.

4.3 The number of consultants who told us that 25 per cent or more of their referrals are inappropriate has increased over the last three years from 6 to nearly 10 per cent. This is consistent with recent draft guidance from the Modernisation Agency, which suggests that between 10 and 40 per cent of referrals to orthopaedic consultants do not need a surgical opinion or do not need it until other treatment options have been tried. If 10 per cent of referrals are inappropriate, this could amount to nearly 15,000 hours of consultant time being wasted each year[17].

4.4 To address this, in December 2001, the National Institute for Clinical Excellence published referral advice on osteoarthritis of the hip in which they recommended that general practitioner referrals be based on a locally developed scoring system which takes account of levels of pain, extent of disability and sleeplessness, loss of independence, inability to undertake normal daily activities, reduced functional capacity or psychiatric illness. Such scoring systems can reduce the level of inappropriate referrals **(Figure 13)**. The Modernisation Agency is doing work to promote the use of scoring systems and to encourage greater provision of care by 'GPs with Special Interest' in orthopaedics and by physiotherapists.

13 Benefits of using a hip pain scoring system - Torbay Hospital

Why was the hip pain scoring system introduced?

Torbay Hospital considered that patients were being referred 'inappropriately' to consultants, with many not going on to have surgery. In collaboration with local primary care teams an intermediate assessment of patients prior to referral for hip/knee replacement surgery using the New Zealand hip pain scoring tool was implemented.

How does it work?

All hip/knee patients referred by GPs are seen by an assessor (an orthopaedic nurse) within 4 weeks of referral. Depending on the 'score', the patient is referred on to the consultant, or discharged back to the GP. Where a GP disagrees with the score they can refer direct to the consultant.

What impact has it had?

Using the scoring tool reduced the number of referrals seen by consultants by 20 per cent in the first 6 months. The waiting time for all outpatients has also reduced overall, and it has led to improved patient understanding of their condition and what they can do to help themselves. It has also provided GPs with an alternative to referral when pressurised by patients to inappropriately refer them to secondary care.

Source: South Devon Health Community

17 *Based on each orthopaedic consultant averaging about 10 hip outpatient appointments per week, a consultation being ~15 minutes long, a national total of 1300 orthopaedic consultants and a consultant having on average 6 weeks leave each year.*

The cost of hip surgery varies widely

4.5 In their Report in December 2000 the Committee of Public Accounts commented on wide variations in the cost which trusts recorded for hip replacement operations. In 2002, according to our survey, the average cost of a primary hip replacement was £4,274 (£3,899 in 2000), with a range of £2,266 to £7,456. The average 2002 cost of a revision hip replacement was £5,756, with a range of £2,260 to £11,489[18]. Some of this variation will reflect the complexity of cases, but there is also likely to be scope for benchmarking to measure efficiency as over half of trusts have already done. The National Schedule of Reference Costs enables trusts to compare their costs with those of similar trusts.

Hip prosthesis purchasing

4.6 As the number of hip replacements has steadily increased over the last four years, so has the average trust spend on hip prostheses - to £294,000 in 2001/02. Although three quarters of trusts in our survey have yet to use the prosthesis benchmarking service available from the NHS Purchasing and Supply Agency, trusts have taken a number of other steps to reduce the costs of their prosthesis purchasing, including:

- putting the contract for supply out to tender;
- negotiating discounts;
- reducing the number of suppliers; and
- setting a standard purchase price for prostheses.

Lost theatre time

4.7 Avoidable delays in starting surgery impact on the use of trust resources and can be upsetting for the patient. Average theatre time per trust lost each week due to delays in starting hip replacement operations has increased from one hour a week in 1999 to two and a half hours a week in 2002, representing about 375 theatre hours across the country each week. The delays are mainly due to shortage of beds or patients being medically unfit. This amounts to about 19,500 hours per year of theatre time lost across the NHS which could be could be used, in part, to perform additional operations[19].

4.8 The Modernisation Agency's Operating Theatre and Pre-Operative Assessment Programme is developing good practice in operating theatres and spreading this throughout the NHS. In June 2002, it published *A Step Guide to Improving Operating Theatre Performance*, and trusts were expected to begin implementing this from December 2002.

Reducing length of stay

4.9 Patient length of stay in hospital is an important issue for both patients and trusts. Most patients prefer to leave hospital as soon as they are fit to do so, and reducing the length of stay enables hospitals to make more effective use of their beds and other resources.

4.10 In recent years, in both the UK and elsewhere, length of stay for hip replacements has decreased. Inevitably patients of different ages, with different risk factors and different home circumstances will require different lengths of stay which are appropriately determined by their medical team. For example, an analysis by BUPA shows a steady increase in average length of stay for primary hip replacement for older patients, from 7.9 days for those aged 40-49 to 12.7 days for those over 80[20].

4.11 In 1999 the average length of stay for NHS hip replacement patients was 11 days for primary hip surgery and 16 days for revision surgery. Our 2002 survey shows that this had decreased markedly, to 8 days and 11.5 days respectively. But nearly 60 per cent of consultants replying to our survey told us that length of stay could be reduced further by up to 3.5 days mainly through:

- earlier access to rehabilitation and physiotherapy services;
- improved discharge planning[21]; and
- improved patient education.

This broadly accords with the position in the private sector, where BUPA has advised consultants that for patients without complications, average length of stay should be 6 days for a primary hip replacement, and 9 days for revision surgery. The Orthopaedic Services Collaborative recommends that for patients without further complications length of stay should be five days.

18 These figures are very similar to those in the 2002 National Schedule of Reference Costs, though these figures for revisions include both hip and knee prostheses.

19 This is an NAO estimate of theatre time lost each year across the NHS. The figure is based on some 150 trusts undertaking orthopaedic work each with average lost time of 2.5 hours a week for 52 weeks.

20 BUPA data.

21 NAO survey (July 2002) carried out as part of the NAO study Ensuring the effective discharge of older patients from NHS acute hospitals, HC 392, 2002-03.

4.12 Though there are benefits to patients and the NHS in reducing length of stay, other factors need to be taken into account. These include whether patients are discharged to home or to other NHS facilities, and the availability of step-down facilities or other arrangements that would free up acute hospital beds whilst providing appropriate patient care. Nonetheless there is general consensus that further reductions in average length of stay are both possible and desirable taking account of clinical needs, and that these could have substantial benefits for patients and trusts alike, including being able to treat more patients **(Figure 14)**.

4.13 **Figure 15** illustrates how, as part of their work with the Orthopaedic Services Collaborative, some trusts have successfully reduced their length of stay for primary hip replacement patients .

14 Treating more patients by reducing length of stay

	Number of beds in hospital		
	40	60	80
Reduction in length of stay (from an average length of stay of 8 days)	Number of additional patients that can be treated in one year		
1 day	**146**	**219**	**291**
2 days	**340**	**510**	**680**
3 days	**612**	**918**	**1224**

Source: NAO analysis[22]

15 Hull and East Yorkshire Hospitals NHS Trusts has reduced its length of stay for total hip replacement patients from 14 days to 7 days

How has length of stay changed for elective orthopaedic patients?

In 1998, the average length of stay for elective hip and knees patients was 14 days. By 2002, this had been reduced to 7 days. The trust is now working towards early discharge (day 4 or 5 post-operatively) to bring this down further for those patients for whom it would be appropriate.

How did the trust reduce its length of stay?

A pathway facilitator was employed to develop an integrated care pathway for the trust in 1997. Following pathway development, a system of monthly audits of the integrated care pathway was implemented. The audits identified weaknesses in the pathway, and a process of continual improvement has led to a reduction in length of stay and improvements in patient care:

- Earlier discharge planning (commencing at pre-assessment);
- Introduction of nurse led pre-assessment clinics;
- Improvements to patient information and patient satisfaction; and
- Reduced duplication of paperwork.

Source: Hull and East Yorkshire Hospitals NHS Trust

22 The data estimates the number of extra patients that could be treated each year following a reduction in length of stay. The figures are based on 240 patient days within a 365 day period, an average initial length of stay of 8 days and on 85 per cent bed occupancy. They assume that necessary resources, such as theatre time, are available to treat additional patients, and no capacity restrictions apply.

Part 5

Diagnosis and Treatment Centres

5.1 The Department of Health national diagnosis and treatment centre programme is a major programme of investment and reform aimed at delivering a new model of healthcare for the NHS for some of the specialties, such as orthopaedics and ophthalmology, which have the highest waiting times. The NHS Plan noted that 20 Centres would be developed by 2004 of which, by then, 8 would be fully operational, treating an estimated 200,000 patients a year. The objectives of the programme are to:

- Improve patient access to elective care by increasing capacity;
- Spearhead diversity in the provision of clinical services;
- Modernise the provision of diagnosis and elective care; and
- Drive productivity gain.

5.2 Diagnosis and treatment centres are designed to provide safe, fast, pre-booked surgery and diagnostic tests for patients by separating scheduled treatment from emergency pressures. Each Centre is expected to embody the features set out in **Figure 16**. If successful, the Centres will help meet some of our recommendations in the Executive Summary of this report, for example, recommendations 25(c), (f) and (h).

5.3 The Diagnosis and Treatment Centre programme is delivered through Centres developed and run by acute trusts or primary care trusts, those run by the private sector, and those run through joint ventures between the NHS and the private sector. The first Centres opened in 2002, and by January 2003 14 Centres were open, of which 13 were run by the NHS. A further 33 NHS Centres are in course of development. The capital investment in the programme is expected to be over £350 million. An example of the potential benefit to patients is at **Figure 17**.

16 Defining features of a diagnosis and treatment centre

1 Embodies forward thinking in service design and delivery;

2 Delivers a high volume of activity in a pre-defined range of treatments and/or diagnostics;

3 Delivers scheduled care unaffected by emergency pressures;

4 Has streamlined and modern services using defined patient pathways;

5 Services are planned and booked, with an emphasis on patient choice and convenience;

6 Clear and trusted identity valued by patients and other stakeholders;

7 Provides a high quality positive patient experience;

8 Creates a positive environment for employees;

9 Adds significantly to the capacity of the NHS to treat patients successfully.

Source: Department of Health

5.4 Of the 13 NHS Centres now open, seven are providing additional orthopaedic capacity, including for elective hip replacement work. The seven Centres opened between January and November 2002 and will all be fully operational by December 2003, when they are expected to provide additional annual capacity for some 9,500 inpatients, and around 2,400 day cases.

17 Ravenscourt Park Hospital - Diagnosis and Treatment Centre

Ravenscourt Park in West London was one of the first wave Diagnosis and Treatment Centres. In its first 11 months of operation (since June 2002) it has treated over 1,900 patients, and will reach its maximum capacity in August 2003, with 105 beds and 6 theatres, taking patients from 16 NHS Trusts.

Recent developments include a new state-of-the-art therapies department, designed to provide extensive patient education pre- and post-operatively; and a large gym with enough space for therapy-led classes for a number of patients at once.

The hospital has a unique pathway, designed to move patients through different Trusts and organisations in a seamless manner. The integrated care pathways for each procedure have helped reduce length of stay to 5.5 days for both hip and knee replacements.

The Patient experience

Mrs W needed a hip replacement in her early fifties. On the way to becoming housebound, getting to local shops was becoming a problem. Faced with a potential wait for an elective hip replacement of up to 15 months, and having been waiting for six months, she was offered an early appointment at the Ravenscourt Park Diagnosis and Treatment Centre. She attended a pre-assessment appointment in October 2002, and her hip was replaced one month later, up to eight months earlier than would otherwise have been the case.

Mrs W was delighted by the service she received at Ravenscourt Park, highlighting the emphasis of Diagnosis and Treatment Centres on providing a high quality positive patient experience, as well as patient choice and convenience.

5.5 The Department of Health is providing £50 million to the NHS to help eliminate long waits for orthopaedic surgery, including hip replacements. £25 million will be used to support and increase capacity in Diagnosis and Treatment Centres that focus on orthopaedic patients. The remaining £25 million will be used to target those NHS Trusts who have historically struggled to cut orthopaedic waiting times, and those who have the availability to deliver extra capacity within the NHS. The Department estimates that the funding will deliver an extra 41,000 orthopaedic operations per year.

Appendix A The National Joint Registry

Background

1 The National Audit Office report on total hip replacement published in April 2000 highlighted the potential benefits of a hip registry. These were:

- a record of all prostheses implanted so patients who have implants that subsequently perform poorly can be identified;
- a monitor of the performance of all prostheses implanted. This enables a long term track record to be established for each prosthesis;
- a history of each patient who has received a hip prosthesis;
- a list of all trusts which carry out hip replacements;
- a database of the numbers of hip replacements carried out by trust and by individual surgeons; and
- effective monitoring of infection rates.

2 The report noted that the Department of Health was to consider the case for a hip registry, and recommended that this be done quickly. The Committee of Public Accounts subsequently endorsed the establishment of a national hip registry and the Department in their Treasury Minute of March 2001 confirmed that there had been extensive consultation on a registry between October 2000 and January 2001. This showed widespread support for it, and the Department were then to consider whether and, if so how, the project should proceed.

3 The British Orthopaedic Association strongly supported a national hip registry, and in July 2001 the Royal College of Surgeons added their support. The same month the (then) Health Minister Lord Hunt announced that the Department would set up a National Joint Registry for hip and knee replacements, covering England and Wales.

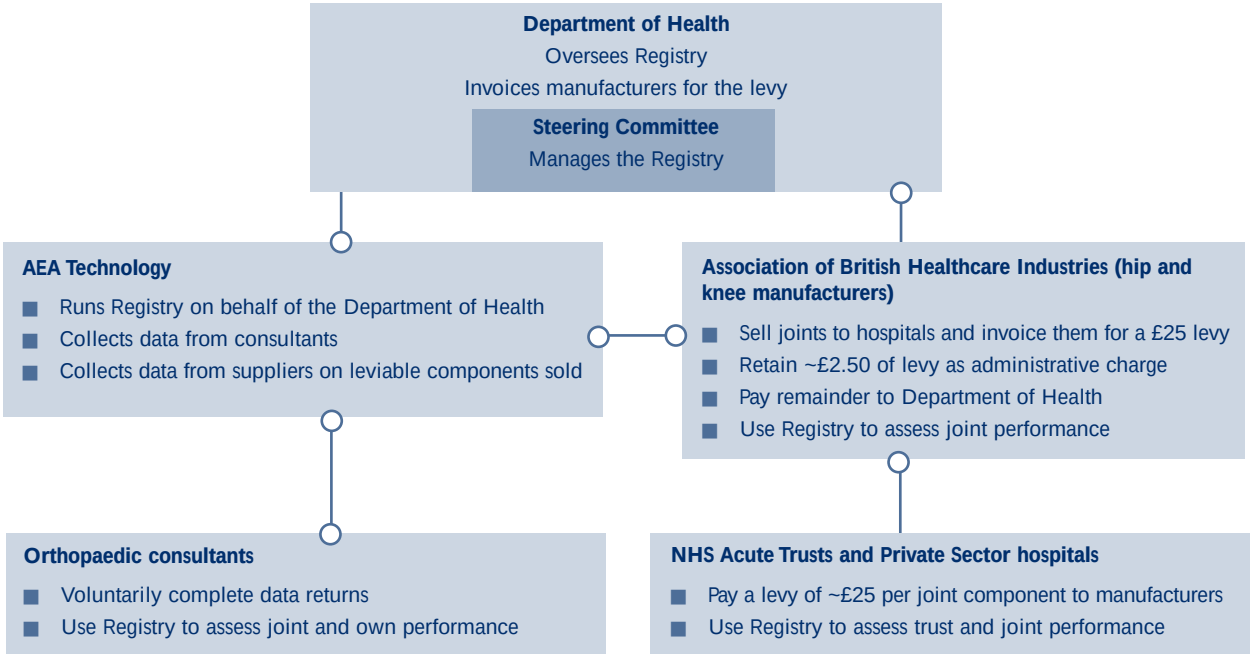
4 In February 2001, the costs of setting up the Registry were estimated at £600,000 (subsequently revised to £714,884), with recurring annual costs of up to £2 million. This could be covered by a reduction in revisions of hip and knee replacements of 4.5 per cent due to improvements in practice. Three options for financing the Registry were considered by the Department - central funding, a levy on manufacturers and a levy on trusts. Whilst central funding would be the easiest to administer, the Department made it clear that the Registry did not come high enough on the priority scale to obtain Department of Health funding; and though a levy on trusts would give trusts greater ownership of the Registry, it was considered to be administratively difficult. It was therefore initially intended that funding would be by means of a levy on orthopaedic manufacturers, a proposal that industry had originally supported.

5 Meetings and correspondence between the Department and industry in 2000 and 2001, however, indicated strong industry opposition to this proposal. While discussions continued, the Department noted that industry's move away from a levy system was delaying the project, and in April 2001 approval was sought from the NHS Chief Executive to postpone the project until central funding could be found in 2003-04. However in June 2001 it was agreed that annual costs would be met through industry collecting a levy from NHS trusts (and the private sector) added to each implant sold, on the understanding that they could recover any costs involved. The Department acknowledged that this would add to cost pressures on trusts in the short term, but saw the Registry as a worthwhile investment to improve patient care. The initial set up costs were to be met by the Department of Health.

6 In March 2002 industry estimated their administrative costs at between £3 and £10 per implant, some £300,000 a year at the lower level, of which the larger manufacturers might receive around £90,000. The Department continued to negotiate with industry on this, suggesting, for example, that industry might pay the Registry set up costs, particularly given the acknowledged significant commercial benefit to manufacturers of a joint registry. Industry did not agree to contribute to the set up costs and requested an administrative cost of £2.50 per implant for two years, reducing to £1.70 from year three. Industry have, however, provided no evidence as to how this administrative charge is costed.

7 In February 2002 the Department advertised for expressions of interest from companies wishing to run the Registry, with the intention that it would go live on 1 April 2003. Eight companies were invited to tender. Four companies submitted written proposals with total costs ranging from £2.1 million to £5.9 million. Whilst their bid was not the lowest, AEA Technology were considered to have provided the best bid to ensure the success of the Registry, and were awarded the contract in November 2002.

18 Funding mechanism for the National Joint Registry



Source: Department of Health

8 Under the contract with AEA Technology, the company will run the National Joint Registry for two years from 1 April 2003 (plus initial set up). All of their costs will be covered by the collection of levy from trusts. Two methods of collecting the levy were considered:

- Manufacturers will include on their invoices to trusts for prosthesis purchases a levy of around £25 for each implant sold, of which they will retain £2.50 to cover administrative costs. AEA Technology will invoice the manufacturers monthly based on the number of relevant implants sold. The administrative cost will be £250,000 per year;
- AEA Technology will collect the levy direct from NHS trusts and the private sector, based on data entered on the joint registry. AEA Technology would charge an administrative cost of £11 per invoice but would invoice low-volume trusts every two months. The administrative cost would be £66,000 per year.

9 The Department concluded that it may be more difficult to collect the levy from trusts and opted for the more expensive option which was considered to provide more security. The Department subsequently decided that, on the grounds of financial control, they would invoice manufacturers rather than AEA Technology doing so. **Figure 18** demonstrates the complexity of the funding mechanism.

10 Until the Registry is fully operational there is a degree of uncertainty as to the number of trusts that will start paying the levy, when they will start, what delays there might be in payments received and the number of relevant implants that might be purchased/used.

11 The work of the National Joint Registry will be overseen by a Steering Committee which has representatives from the orthopaedic profession, theatre nurses, patient groups, industry, public health, NHS trusts and the private sector.

Joint registries overseas

12 A number of countries have established joint registries **(Figure 19)**. The principal ones are in Sweden, Finland, Norway, New Zealand, Canada and Australia, the first being established in Sweden in 1979. In most cases these registries were set up by the relevant national orthopaedic association and are run by those associations, by hospitals or government agencies. The National Joint Registry is the first where the day to day running of the Registry is carried out by the private sector.

13 Set up costs for the overseas registries (and the National Joint Registry) were paid for mainly by central government and national orthopaedic associations. However the National Joint Registry is the only major registry which is required to be self-financing and where the running costs are not met directly by central government but from a levy on NHS trusts. Half of the overseas registries have compulsory membership and half are voluntary. Compliance rates, where known, are high - 95 - 100 per cent - except in the case of the voluntary Canadian registry where compliance (excluding Ontario) is 51 per cent.

19 Principal Joint Registries overseas

	Sweden	Finland	Norway	New Zealand	Canada	Australia	UK (England and Wales)
When did it go fully live?	1979	1980	1987	1999	2000	2002	2003
Who set it up?	Swedish Orthopaedic Association	Finnish Orthopaedic Association	Norwegian Orthopaedic Association	New Zealand Orthopaedic Association (NZOA)	Canadian Institute for Health Information (CIHI) *	Australian Orthopaedic Association (AOA)	The Department of Health
Who maintains it?	Sahlgrenska University Hospital	National Agency for Medicines (NAM)	Haukeland University Hospital (UHU)	NZOA	CIHI	AOA	A private sector company - AEAT
Is it compulsory?]	Yes	Yes	No	Yes	No	No (but all hospitals have agreed)	No
Who paid the set up costs?	Research grants from Central Government	Central Government	The Norwegian Medical Association & various private funds	NZOA	CIHI	AOA, Orthopaedic companies and Federal Government	Department of Health
Who pays for the running costs?	Central Government	Central Government	Central Government	Central Government and NZOA	Central Government	Central Government	NHS Trusts
Are any costs recovered?	No	About 10%, by studies paid for by hospitals, hospital districts or industry	No	A levy of $10 per joint replacement on public patients collected by the implant industry	No	No	Trusts pay a levy on prostheses purchased. The Registry is self financing
What is the compliance rate?	Close to 100%	95 - 98%	95% (at least)	95% (estimation)	51% of orthopaedic surgeons excluding Ontario	100%	?

* A not-for-profit organisation, funded through bilateral funding agreements with Federal and provincial/territorial ministries of health and individual health care institutions

Source: NAO analysis

Appendix B Methodology

1 The methodology for undertaking the follow up study on hip replacement services comprised:

- Self completion questionnaires in October 2002 to orthopaedic directorate managers of all 155 NHS trusts in England undertaking orthopaedic work and to all orthopaedic consultants working in those trusts. We received 125 responses from directorate managers (80 per cent response rate) and 650 from consultants (some 50 per cent response rate). These high response rates are expected to be representative of the population, though some degree of bias cannot be ruled out. We used external consultants to provide data input, but analysed the results in-house;
- A literature search and international comparisons;
- Analysis of relevant data from the Department of Health, including file review;
- Interviews with key players including in the (then) Medical Devices Agency, NHS Purchasing & Supply Agency, National Institute for Clinical Excellence, Commission for Health Improvement, Action On Orthopaedics, the Orthopaedic Services Collaborative and the Department of Health;
- Consultation with an expert panel to advise on key issues.

2 The expert panel consisted of:

Andrew Crosbie,	Medicines and Healthcare products Regulatory Agency
Paul Gregg,	Consultant Orthopaedic Surgeon and President of the British Orthopaedic Association
Professor Harper,	Consultant Orthopaedic Surgeon
Colin Howie,	Consultant Orthopaedic Surgeon
Kaye McIntosh,	Editor, Health Which? magazine
Professor Nixon,	Consultant Orthopaedic Surgeon
Robert Royce,	BUPA
Andy Smallwood,	NHS Purchasing and Supply Agency
Ann Stephenson,	Branch head, Department of Health
Mark Wilkinson,	Consultant Orthopaedic Surgeon
Paul Woods,	Department of Health