

# British Orthopaedic Association

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## **TOTAL HIP REPLACEMENT: A GUIDE TO BEST PRACTICE**

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# **PREFACE**

This document sets out a statement of best practice for Total Hip Replacements. It represents a consensus statement from the British Orthopaedic Association and the British Hip Society. It is hoped that the Guide, an interim statement, will inform Surgeons, Trusts and Purchasers and also improve the care of patients with disorders of the hip joint.

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# **1. INTRODUCTION**

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- 1.1 This document is a statement of best practice in primary total hip replacement and has been approved by the Council of the British Orthopaedic Association and by the British Hip Society.
- 1.2 Many studies of the operation of total hip replacement identify its cost effectiveness<sup>1,2</sup> and high patient satisfaction rates in the short term.<sup>3</sup> The majority of patients are relieved of the pain and disability of hip arthritis, which may have compromised their quality of life and even their independence before operation.
- 1.3 There is a notable variation in the types of implants used, surgical techniques, post operative surveillance, and longer term outcomes across the UK.
- 1.4 From available data, the document identifies best practice in general terms. It is not a statement which claims to be applicable to all patients or in all circumstances. Each consultant or those working under the supervision of a consultant must continue to take into account the individual requirements of each patient. Presently, there is a shortfall of auditable standards for the operation and associated care. Standards can only be set by the widespread collection of uniform data, centred on NHS Trusts and made available for regional and national audit.
- 1.5 This document should be read in conjunction with “The Advisory Book on Consultant Trauma and Orthopaedic Services”; British Orthopaedic Association 1999.

# **2. THE INDICATIONS FOR THE OPERATION**

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Severe pain and disability usually with accompanying radiological changes at the hip are generally thought to be the indications for the operation, in patients where non-operative treatment has failed or is futile.<sup>4</sup> Where co-morbidities exist, risk benefit considerations may rule out the operation in an individual patient. There is still variation in the rate of THR per head of population across the English regions.<sup>5</sup>

# **3. THE OUTPATIENT CONSULTATION**

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- 3.1 The pain and suffering of patients waiting for treatment is self evident. Government targets for a first NHS outpatient appointment are not generally achievable, nor sustainable, given the shortage of consultant orthopaedic surgeons in the UK.
- 3.2 Discussion regarding operative management of hip arthritis should ideally involve a surgeon with a Certificate of Completion of Surgical Training, or consultant, who, by definition, are on the GMC’s Specialist Register.
- 3.3 The British Orthopaedic Association regards 15-20 minutes as the minimum time allowed for the first consultation.<sup>6</sup>
- 3.4 A confidential environment with access for relatives, and the reliable availability of notes and x-rays are essential for the consultation.

- 3.5 After clinical examination and general medical assessment the Consultant should provide the patient with an explanation of the problem in understandable language and discuss the available treatment options.
- 3.6 The Surgeon should offer information on the risks and benefits of any suggested treatment and the outcomes of performance of any proposed hip replacement preferably in his or her hands. The precise reasons for the operation should be given.

## **4. WAITING FOR THE OPERATION**

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- 4.1 In a cash-limited service, it is accepted that there will always be a delay before elective operations can be carried out. Consultants are expected to manage their waiting lists ethically and patients should be admitted for operation according to clinical priority and social circumstances.

## **5. PRE-OPERATIVE ASSESSMENT**

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- 5.1 A managed system of pre-operative assessment is recommended as good practice. Such arrangements are now commonplace<sup>7</sup> and allow the most efficient use of scarce resources. Normally, the assessment should take place within six weeks of the operation.
- 5.2 Pre-operative assessment clinics staffed by Doctors and Clinical Nurse Practitioners working to protocols with the ability to involve Anaesthetists and Professions Allied to Medicine guard against cancellations, identify co-morbidities and allow discharge planning. There is also an opportunity for patient education.
- 5.3 Routine investigation of blood, urine, blood pressure and an ECG are best carried out at the pre-operative assessment.
- 5.4 Provisional discharge planning should take place in the pre-operative assessment clinic. The planning takes into consideration age, co-morbidities, home circumstances and the availability of carers after discharge.
- 5.5 Access to appropriate rehabilitation beds should be available particularly for the elderly and the more severely disabled.

## **6. THE ADMISSION TO HOSPITAL**

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- 6.1 Patients should be admitted to hospital with sufficient time before their hip replacement to allow pre-operative and pre-anaesthetic procedures to be completed. The limb for operation should be marked in an area which is still visible after draping, and an explanation of anaesthesia given by the anaesthetist involved.
- 6.2 The patient must give consent to the operating surgeon. Guidance for surgeons on this process has been given by the Senate of Surgery of Great Britain and Ireland.<sup>8</sup> Consent may be given in the outpatients, the pre-admission clinic, or in the ward.

## **7. HOSPITAL FACILITIES REQUIRED FOR THE OPERATION OF PRIMARY TOTAL HIP REPLACEMENT**

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- 7.1 Primary total hip replacement operations are best carried out in hospitals where Consultant back-up from other medical and surgical disciplines is readily available.
- 7.2 Access to a High Dependency Unit and/or intensive care facilities is essential.
- 7.3 Adequate numbers of trained nurses<sup>6</sup> and the skills of Professions Allied to Medicine must be available. There must be social services back-up.
- 7.4 In order to reduce the risk of cross infection, total hip replacement patients should be nursed in orthopaedic wards, which are staffed by a team experienced in the management of arthroplasty patients.

## **8. REQUIRED THEATRE RESOURCES**

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- 8.1 The use of ultra clean air theatres is considered to be best practice for units performing total hip replacement operations.<sup>9</sup>
- 8.2 The operating theatre should be dedicated to clean elective orthopaedic surgery or joint replacement. Shared facilities with other clean surgical disciplines is acceptable practice when using ultra clean air, but data supporting this practice are not available.
- 8.3 The surgeon must have trained assistance during the operation, and a trained scrub nurse fully familiar with the required complex instrumentation is mandatory. In the absence of junior staff, additional nursing assistants or specifically trained Surgeon's Assistants must be available. Sometimes more than one assistant is required.
- 8.4 A full range of specialised implants and instruments must be readily available. Appropriate impenetrable clothing and drapes are also essential.

## **9. THE SURGEON**

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- 9.1 The completion of Higher Surgical Training and acquisition of a CCST allows a surgeon entry to the Specialist Register of the GMC and enables Consultant practice in the NHS. Consultants with this training and registration are equipped with the skills and knowledge to make judgements and exercise discretion when selecting patients for the operation.
- 9.2 The theoretical and practical skills of the Consultant Surgeon performing primary total hip replacement operations must be maintained by CME.
- 9.3 Total hip replacement operations performed by surgeons in training must be supervised by Consultants. The level of supervision should be according to the experience of the trainee. In the absence of consultant supervision, prospective arrangements must be made for on-site consultant cover.

- 9.4 During the 5th and 6th years of Higher Surgical Training, some trainees receive advanced training in hip surgery, including the surgical management of the more complex cases and secondary operations [revisions]. They are usually appointed as Consultants to NHS posts in which hip surgery is a major component of their elective work. There is an expectation that many more such highly specialised surgeons will need to be trained in order to cope with the anticipated increase in the volume of complex hip reconstruction.
- 9.5 The operation requires an anaesthetist with the appropriate skills and techniques for Total Hip Replacement.

## **10. RECORD KEEPING AND THE OPERATION NOTES**

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### *Clinical Records*

- 10.1 Good records are a basic tool of clinical practice, and should be typed.
- 10.2 The records must include the name, date of birth and address of the patient, and the referring general practitioner should be identified. The hospital number should be clear. The hospital and surgeon with responsibility of care should be named.
- 10.3 The admission note should record the general medical condition of the patient as well as fitness for operation. It should contain a clinical history, the full clinical examination findings, pre-existing medical history, and all current disabilities. The purpose of the operation should be stated. All medication should be listed.
- 10.4 An explanation of the proposed procedure as well as the risks and benefits should be recorded. The implant intended should be explained to the patient together with the success and failure rates of the implant. The operating surgeon should normally complete the consent form with the patient. If this is done in outpatients, only a short delay should take place before the surgery is undertaken.

### *Operative and Post-Operative Records*

- 10.5 It is best practice that operative notes be made in writing, or dictated for immediate typing and signature by the operating surgeon. If a pre-arranged pro forma is being used the operating surgeon should personally complete the pro forma.
- 10.6 A record of the operation should be made immediately following surgery and should include<sup>10</sup>:
- The name of the operating surgeon, assistants and the name of the consultant responsible
  - The diagnosis made and the procedure performed
  - Description of the findings
  - Details of tissue removed, altered or added
  - Details of serial numbers of prostheses and other implanted materials
  - Details of bone grafting

- Details of sutures used
- An accurate description of any difficulties or complications encountered and how these were overcome
- Immediate post-operative instructions
- The surgeon's signature and the date of the operation

10.7 The anaesthetic record, signed by the anaesthetist, should contain:

- The name of the anaesthetist and, where relevant, the name of the consultant anaesthetist responsible
- Pre-operative assessment by the anaesthetist, and the date the assessment was performed
- Drugs and doses given during anaesthesia and route of administration
- Type and site of any regional anaesthetic used
- Monitoring data
- Intravenous fluid therapy, if given
- Post-anaesthetic instructions
- The anaesthetic record should be filed with the clinical notes

10.8 Progress after operations, including early complications, should be listed. The date of discharge and arrangements for continuity of care should be recorded.

10.9 It is accepted that all notes should be contemporaneous and should not be altered; errors should be identified. Orthopaedic records within general hospital records should be easily identified within the case notes. All computer-assisted recording should conform to the Data Protection Act.

10.10 Follow-up notes should allow another doctor to assume the care of the patient at any time.

- All doctors referred to in an entry must be identified by name and designation
- Details of written and verbal information given to general practitioners, patients, relatives and carers, whether at admission or later, must be recorded
- Details of all investigations considered and whether the investigation has actually been requested should be noted
- Ideally, at least one entry every day recording the patient's progress
- An entry when the management of the patient is changed or when there is an additional procedure

- An entry should be made whenever a doctor is called to see a patient
  - Deletions should be made with a single line and signed and dated
- 10.11 All patients should have a good quality antero-posterior and lateral radiograph of the hip, ideally before discharge from hospital
- 10.12 There should be an agreed protocol for the retention of all documents and X-rays.
- 10.13 In Private Practice the whole process should follow the same high standard

## **11. THE CHOICE OF IMPLANT AND MODE OF FIXATION OF THE PRIMARY THR**

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- 11.1 Orthopaedic Surgeons have large numbers of hip devices from which to choose.<sup>11</sup> Many of these devices have not been subject to studies of outcome for as long as 10 years.<sup>12</sup>
- 11.2 Many factors determine surgeon preference for an individual implant. Influences include their trainers, consultant colleagues, a desire to improve their own results or the perceived outcomes of existing devices. The manufacturers of hip devices can also have a significant effect on choice, through the service they provide.
- 11.3 Choice of prosthesis is in many cases limited by purchasing authorities, Trust or Directorate policy and budget limitation.
- 11.4 Published results of many hip implants offer little help to the surgeon wishing to make an informed choice. Most outcome research is short term, non-comparative and does not take into account case-mix and variations in the operative technique of the operating surgeon. Importantly, there is no agreed standardisation of outcome measures for total hip replacement.
- 11.5 A further confounding factor for the surgeon is that hip devices with apparently good published results have in the meantime been modified by the manufacturers and the clinically tested design is no longer available. There has been a failure to realise that even minor modifications to design, material, surface finish, or fixation techniques can dramatically alter the performance of a total hip replacement.
- 11.6 The selection of a hip prosthesis for general use should normally be based on evidence published in peer reviewed journals. A clinical follow-up of more than 10 years with a published life table and survivorship curve calculated according to best statistical practice are recommended criteria in support of the use of a particular hip prosthesis.<sup>13</sup>
- 11.7 In the absence of peer reviewed evidence of outcome to ten years, a device must be subject to ongoing surveillance and preferably be part of a properly conducted controlled prospective trial. The use of such devices should have ethical approval.

## **12. PROPHYLAXIS AGAINST VENOUS THROMBOSIS AND PULMONARY EMBOLISM**

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- 12.1 It is well recognised that thromboembolism does occur after primary total hip replacement but there is still some debate regarding the precise incidence of this complication. Recent evidence suggests that the prevalence of fatal pulmonary embolism, even in the absence of chemical prophylaxis, is very low,<sup>14</sup> and much lower than quoted in historical papers.<sup>15</sup>
- 12.2 There is no doubt that deep venous thrombosis occurs fairly commonly after primary total hip replacement and can be demonstrated, by venography, in between 30 and 60% of cases at any level and 10 to 20% of cases proximally. Only a few of these develop a clinical event causing death or morbidity.
- 12.3 There is no good evidence to suggest that the use of chemical prophylaxis reduces either overall mortality or fatal pulmonary embolism.<sup>15</sup> Furthermore, in contemporary practice, total hip replacement should be regarded as “moderate risk” for death from pulmonary embolism.<sup>15</sup> Chemical prophylaxis may reduce the risk of non-fatal pulmonary embolism, but rigorous scientific evidence is not available. There are usually no long term sequelae from this condition.
- 12.4 There is, however, strong evidence for the effectiveness of low dose Heparin, low molecular weight Heparin and Warfarin in reducing radiological DVT by 40 to 60%,<sup>16,17</sup> but death from other causes may be increased. There is also considerable concern regarding possible bleeding complications which may put the total hip replacement at considerable risk.
- 12.5 Therefore, it is clear that there is still some doubt about the precise role of chemical prophylaxis in this situation and, on present evidence, it cannot be considered as mandatory. The surgeon should be left to weigh up the pros and cons of current evidence and, most importantly, share with the patient his or her approach to the problem.
- 12.6 Under normal circumstances, early mobilisation (24 to 48 hours) after surgery should always be considered as should the use of mechanical methods of reducing deep venous thrombosis although rigorous scientific evidence that these are effective is also lacking. These are, by and large, free of significant side effects.

## **13. PROPHYLAXIS AGAINST INFECTION**

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- 13.1 Patients, prior to hip replacement, should be clinically screened for active infection.
- 13.2 All patients should receive an intravenous broad spectrum antibiotic at induction of anaesthesia and for the first 24-36 hours after the operation.<sup>18</sup>
- 13.3 Total Hip Replacement should be performed in ultra clean air theatres.
- 13.4 The use of gentamycin-impregnated bone cement in combination with systemic antibiotics further reduces the risk of infection.<sup>19</sup>

- 13.5 A combination of systemic antibiotics, gentamycin-impregnated cement, ultra clean air and ventilated suits provides the most effective infection prophylaxis.<sup>18</sup>
- 13.6 Catheterisation in the peri-operative period should be covered by the administration of an appropriate antibiotic.<sup>19</sup>

## **14. SURGICAL TECHNIQUE**

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- 14.1 Any approach to the Hip Joint which allows a view of 360° of the face of the acetabulum and the delivery of the proximal femur into the wound is acceptable.
- 14.2 The recognised complications of particular approaches must be explained to the patient.
- 14.3 For cemented Hip Replacement it is accepted that the interface should be cleaned, irrigated and dried before the introduction of bone cement. Bone cement is introduced when viscous and pressurised before introducing the component.
- 14.4 On the femoral side it is generally accepted that the intramedullary canal should be plugged and the cement injected retrogradely with a gun.<sup>20,21</sup> Techniques to centralise the stem in the cement mantle are an important technical adjuvant.<sup>22,23</sup>
- 14.5 For cementless hip replacement, adequate preparation of the bone and stable fixation of the implants must be achieved at operation.
- 14.6 Surgeons should ensure the integrity of the hip abductor mechanism and the iliotibial band at the end of the operation.
- 14.7 Efforts should be made to ensure leg length equality employing techniques such as pre-operative templating and trial reduction intra-operatively. It is acknowledged that leg length equality cannot be achieved in every case.
- 14.8 Every attempt should be made to ensure stability of the hip joint by correct implant selection, appropriate bone resection and an assessment of soft tissue tension.
- 14.9 The operation requires an anaesthetist with the appropriate skills and techniques for Total Hip Replacement.

## **15. THE FOLLOW-UP OF PATIENTS AFTER TOTAL HIP REPLACEMENT**

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- 15.1 The follow-up arrangements that surgeons and hospitals make for THR patients vary across the UK. Most surgeons discharge patients after one year<sup>7</sup> and few patients are followed beyond five years.
- 15.2 Primary Hip Replacements fail between five and ten years and many more fail after ten years.<sup>24</sup> For best practice, patients should be followed up clinically and radiologically in the longer term. The minimum requirement is an A.P. and Lateral X-ray at five years, and each five years thereafter.

- 15.3 Failure from aseptic loosening of a hip replacement is often silent – the patient does not complain. Regular follow-up identifies the patient at risk of progressive failure. Exchange or revision operations should be planned and performed before massive bone destruction occurs. The latter situation makes a subsequent operation more formidable, more demanding of resources, and less likely to succeed. Revision operations are much less successful than primary replacements.<sup>5,24</sup>
- 15.4 Follow-up by using questionnaires with x-ray checks by non-medically qualified practitioners is used in some centres, but there is no audit evidence of the efficacy of such arrangements.
- 15.5 Resources must be made available for prolonged follow-up and data from each Trust should be available and obtainable in a common format for regional and national audits.

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