

The management of hip fracture in adults

NICE guideline

Draft for consultation, October 2010

If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the full version.

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Introduction

Hip fracture refers to a fracture occurring in the area between the edge of the femoral head and 5 centimetres below the lesser trochanter (see figure 1 in the Full Guideline). These fractures are generally divided into two main groups. Those above the insertion of the capsule of the hip joint are termed intracapsular, subcapital or femoral neck fractures. Those below the insertion are extracapsular. The extracapsular group is then further split into trochanteric (inter or per-trochanteric and reverse oblique) and subtrochanteric.

Hip fracture is a major issue due to an ever increasing ageing population. About 70–75,000 hip fractures occur annually and the annual cost (including medical and social care) for all UK hip fracture cases is about £2 billion. About 10% of people with a hip fracture die within 1 month and about one-third within 12 months. Most of the deaths are due to associated comorbidities (including bronchopneumonia) and not just to the fracture itself reflecting the high prevalence of comorbidity. Because the occurrence of fall and fracture often signals underlying ill health, a comprehensive multidisciplinary approach is required from presentation to subsequent follow-up, including the transition from hospital to community.

This guidance covers the management of hip fracture from the point of admission to secondary care through to final return to the community and discharge from specific follow-up. It assumes that anyone clinically suspected of having a hip fracture will normally be referred for immediate hospital assessment. It excludes (other than by cross-reference) aspects covered by parallel NICE guidance, most notably primary and secondary prevention of fragility fractures, but recognises the importance of effective linkage to these closely related elements of comprehensive care. Although hip fracture is predominantly a phenomenon of later life (the average age of a person with hip fracture is 77 years), this guidance is applicable to adults across the age spectrum.

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Although not a structured service delivery evaluation, the Guideline Development Group was required to extend its remit to cover essential implications for service organisation within the NHS where these are fundamental to hip fracture management, and this has been done.

The guideline will assume that prescribers will use a drug's summary of product characteristics to inform decisions made with individual patients.

Patient-centred care

This guideline offers best practice advice on the care of patients with hip fracture.

Treatment and care should take into account patients' needs and preferences. People with hip fracture should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If patients do not have the capacity to make decisions, healthcare professionals should follow the Department of Health's advice on consent (available from www.dh.gov.uk/consent) and the code of practice that accompanies the Mental Capacity Act (summary available from www.publicguardian.gov.uk). In Wales, healthcare professionals should follow advice on consent from the Welsh Assembly Government (available from www.wales.nhs.uk/consent).

Good communication between healthcare professionals and patients is essential. It should be supported by evidence-based written information tailored to the patient's needs. Treatment and care, and the information patients are given about it, should be culturally appropriate. It should also be accessible to people with additional needs such as physical, sensory or learning disabilities, and to people who do not speak or read English.

If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care.

Families and carers should also be given the information and support they need.

Key priorities for implementation

Timing of surgery

- Perform surgery on the day of, or the day after, admission.
- Identify and treat correctable comorbidities immediately so that surgery is not delayed by:
 - anaemia
 - anticoagulation
 - volume depletion
 - electrolyte imbalance
 - uncontrolled diabetes
 - uncontrolled heart failure
 - correctable cardiac arrhythmia or ischaemia
 - acute chest infection
 - exacerbation of chronic chest conditions.

Planning the theatre team

- Schedule surgery for hip fracture patients on a planned trauma list.

Surgical procedures

- Offer replacement arthroplasty to patients with a displaced intracapsular fracture.
- Offer total hip replacement to patients with a displaced intracapsular fracture who:
 - were independently mobile before fracture and
 - are not cognitively impaired and
 - are medically fit for anaesthesia and the operation.
- Offer extramedullary implants such as a sliding hip screw in preference to an intramedullary nail to patients with trochanteric fractures above and including the lesser trochanter (AO classification types A1 and A2).

Mobilisation strategies

- Offer patients physiotherapy assessment and, unless medically or surgically contraindicated, mobilisation on the day after surgery.

- Offer patients mobilisation at least once a day and ensure regular physiotherapy review.

Multidisciplinary management

- From admission, offer all hip fracture patients a formal, acute orthogeriatric or orthopaedic ward-based Hip Fracture Programme that includes all of the following:
 - orthogeriatric assessment
 - rapid optimisation of fitness for surgery
 - early identification of individual goals for multidisciplinary rehabilitation to recover mobility and independence, and to facilitate return to pre-fracture residence and long-term well-being
 - continued co-ordinated orthogeriatric and multidisciplinary review
 - communication with the primary care team.
- Consider offering early supported discharge (ESD) as part of the Hip Fracture Programme (HFP) provided the HFP multidisciplinary team (MDT) remain involved and the patient meets all of the following criteria:
 - medically stable
 - no cognitive impairment
 - able to transfer and mobilise short distances
 - rehabilitation potential not yet achieved.

1 Guidance

The following guidance is based on the best available evidence. The full guideline ([add hyperlink]) gives details of the methods and the evidence used to develop the guidance.

1.1 *Imaging options in occult hip fracture*

1.1.1 Offer magnetic resonance imaging (MRI) if hip fracture is suspected despite negative anteroposterior pelvis and lateral hip X-rays. If MRI is not available within 24 hours or is contraindicated, consider computed tomography (CT).

1.2 *Timing of surgery*

1.2.1 Perform surgery on the day of, or the day after, admission. Identify and treat correctable comorbidities immediately so that surgery is not delayed by:

- anaemia
- anticoagulation
- volume depletion
- electrolyte imbalance
- uncontrolled diabetes
- uncontrolled heart failure
- correctable cardiac arrhythmia or ischaemia
- acute chest infection
- exacerbation of chronic chest conditions.

1.3 *Analgesia*

- 1.3.1 Offer immediate analgesia to patients presenting at hospital with suspected hip fracture, including people with cognitive impairment
- 1.3.2 Assess pain:
- within 30 minutes of administering initial analgesia **and**
 - hourly until settled on the ward **and**
 - regularly as part of routine nursing observations throughout admission.
- 1.3.3 Ensure analgesia is sufficient to allow movements necessary for investigations (as indicated by the ability to tolerate passive external rotation of the leg), and for nursing care and rehabilitation.
- 1.3.4 Offer paracetamol every 6 hours preoperatively unless contraindicated.
- 1.3.5 Offer additional opioids if paracetamol alone does not provide sufficient preoperative pain relief.
- 1.3.6 Consider adding nerve blocks if paracetamol and opioids do not provide sufficient preoperative pain relief or to limit opioid dosage. Nerve blocks should be administered by trained personnel. Do not use nerve blocks as a substitute for early surgery.
- 1.3.7 Offer paracetamol every 6 hours post-operatively unless contraindicated.
- 1.3.8 Offer additional opioids if paracetamol alone does not provide sufficient post-operative pain relief.
- 1.3.9 Non-steroidal anti-inflammatory drugs (NSAIDs) are not recommended.

1.4 *Anaesthesia*

- 1.4.1 Offer patients a choice of spinal or general anaesthesia after discussing the risks and benefits.
- 1.4.2 Consider intraoperative nerve blocks for all patients undergoing surgery.

1.5 *Planning the theatre team*

- 1.5.1 Schedule surgery for hip fracture patients on a planned trauma list.
- 1.5.2 Unsupervised trainees should not undertake surgery or anaesthesia on patients with hip fracture.

1.6 *Surgical procedures*

- 1.6.1 Operate on patients with the aim to allow them to fully weight bear (without restriction) in the immediate post-operative period.
- 1.6.2 Offer replacement arthroplasty to patients with a displaced intracapsular fracture.
- 1.6.3 Offer total hip replacement to patients with a displaced intracapsular fracture who:
 - were independently mobile before fracture and
 - are not cognitively impaired and
 - are medically fit for anaesthesia and the operation.

- 1.6.4 Consider using a proven femoral stem design rather than Austin Moore or Thompson stems for arthroplasties. Suitable designs include those with an Orthopaedic Data Evaluation Panel rating of 10A, 10B, 10C, 7A, 7B, 5A, 5B, 3A or 3B.
- 1.6.5 Offer cemented implants to patients undergoing surgery with arthroplasty.
- 1.6.6 Consider an anterolateral approach in favour of a posterior approach when inserting a hemiarthroplasty.
- 1.6.7 Offer extramedullary implants such as a sliding hip screw in preference to an intramedullary nail to patients with trochanteric fractures above and including the lesser trochanter (AO classification types A1 and A2).
- 1.6.8 Offer an intramedullary nail to patients with a subtrochanteric fracture.

1.7 Mobilisation strategies

- 1.7.1 Offer patients physiotherapy assessment and, unless medically or surgically contraindicated, mobilisation on the day after surgery.
- 1.7.2 Offer patients mobilisation at least once a day and ensure regular physiotherapy review.

1.8 Multidisciplinary management

- 1.8.1 From admission, offer all hip fracture patients a formal, acute orthogeriatric or orthopaedic ward-based Hip Fracture Programme that includes all of the following:
- orthogeriatric assessment
 - rapid optimisation of fitness for surgery
 - early identification of individual goals for multidisciplinary rehabilitation to recover mobility and independence, and to

facilitate return to pre-fracture residence and long-term well-being

- continued co-ordinated orthogeriatric and multidisciplinary review
- communication with the primary care team.

1.8.2 If a hip fracture complicates or precipitates a terminal illness, the multidisciplinary team should still consider the role of surgery, as part of a palliative care approach that:

- minimises pain and other symptoms **and**
- establishes patients' own priorities for rehabilitation **and**
- considers patients' wishes about their end-of-life care.

1.8.3 Actively look for cognitive impairment in all patients presenting with hip fracture and offer individualised care in line with 'Delirium' (NICE clinical guideline 103) to minimise the risk of delirium and maximise independence.

1.8.4 Consider offering early supported discharge (ESD) as part of the Hip Fracture Programme (HFP) provided the HFP multidisciplinary team (MDT) remain involved and the patient meets all of the following criteria:

- medically stable
- no cognitive impairment
- able to transfer and mobilise short distances
- rehabilitation potential not yet achieved.

1.8.5 Only consider intermediate care (continued rehabilitation in a community hospital or residential care unit) if all the following criteria are met:

- intermediate care is included in the Hip Fracture Programme

- the Hip Fracture Programme leads clinically; on patient selection, and in agreeing length of stay and objectives for intermediate care
- the Hip Fracture Programme leads managerially; ensuring that intermediate care is not resourced at the expense of the acute hospital's multidisciplinary team.

1.8.6 Patients admitted from care or nursing homes should not be denied the benefits of a rehabilitation programme in the community, hospital or as part of an early supported discharge programme.

1.9 *Patient and carer views and information*

1.9.1 Offer patients and their families and carers verbal and written information about treatment and care including:

- diagnosis
- choice of anaesthesia
- choice of analgesia and other medications
- surgical procedures
- possible complications
- post-operative care
- rehabilitation programme
- likely long-term outcome
- healthcare professionals involved.

2 Notes on the scope of the guidance

NICE guidelines are developed in accordance with a scope that defines what the guideline will and will not cover. The scope of this guideline is available from www.nice.org.uk/NICEtoaddetails.

How this guideline was developed

NICE commissioned the National Clinical Guidelines Centre to develop this guideline. The Centre established a guideline development group (see appendix A), which reviewed the evidence and developed the recommendations. An independent guideline review panel oversaw the development of the guideline (see appendix B).

There is more information about how NICE clinical guidelines are developed on the NICE website (www.nice.org.uk/HowWeWork). A booklet, 'How NICE clinical guidelines are developed: an overview for stakeholders, the public and the NHS' (fourth edition, published 2009), is available from NICE publications (phone 0845 003 7783 or email publications@nice.org.uk and quote reference N1739).

3 Implementation

NICE has developed tools to help organisations implement this guidance (see www.nice.org.uk/CGXX).

4 Research recommendations

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future. The Guideline Development Group's full set of research recommendations is detailed in the full guideline (see section 4.3.6).

4.1 *Imaging options in occult hip fracture*

In patients with a continuing suspicion of a hip fracture but whose radiographs are normal, what is the effectiveness of computed tomography compared to magnetic resonance imaging, in confirming or excluding the fracture?

Why this is important

The GDG's consensus decision to recommend CT over a radionuclide bone scan as an alternative to MRI to detect occult hip fractures reflects current NHS practice but assumes that advances in technology have made the reliability of CT comparable to that of MRI. If modern CT indeed can be shown to have similar reliability and accuracy to MRI, then this has considerable implications because of its widespread availability out of hours and lower cost. It is a high priority, therefore, to confirm or refute this assumption by direct randomised comparison. The study design would need to retain MRI as the 'gold standard' for cases of uncertainty and would clearly need to standardise the criteria, expertise and procedures for radiological assessment. Numbers required would depend on the degree of sensitivity and specificity (the key outcome criteria) set as target requirement for comparability, but need not necessarily be very large.

4.2 *Anaesthesia*

What is the clinical and cost effectiveness of regional versus general anaesthesia on post-operative morbidity in patients with hip fracture?

Why this is important

No recent randomised controlled trials were identified that fully address this question. The evidence is old and does not reflect current practice. In addition, in most of the studies the patients are sedated before regional anaesthesia is administered and this is not taken into account when analysing the results. The study design for the proposed research would be best addressed by a randomised controlled trial. This would ideally be a multi-centred trial including 3000 participants in each arm. This is achievable if one considers that there are 70,000 hip fractures a year in the UK. The study should have three arms which look at spinal anaesthesia versus spinal anaesthesia plus sedation versus general anaesthesia, this would separate those with regional anaesthesia from those with regional anaesthesia plus sedation. The study would also need to control for surgery, especially type of fracture, prosthesis and grade of surgeon.

A qualitative research component would also be helpful to study patient preference for type of anaesthesia.

4.3 *Displaced intracapsular hip fractures*

What is the clinical and cost effectiveness of large head total hip replacement versus hemiarthroplasty on functional status, reoperations and quality of life in patients with displaced intracapsular hip fracture?

Why this is important

Large head total hip replacement is a development of traditional total hip replacement where a larger head makes the joint more stable and hence reduces the risks of dislocation. Previous three small trials have shown traditional small head total hip replacement have shown better outcomes and function yet with an increased dislocation rate in selected groups of patients. The drawback with the large head arthroplasty is the additional implant cost and theatre time. This cost can account for up to 20% of current NHS tariff (up to £2000) and the study aims to address whether this translates to improved patient outcome. The study design for the proposed research would be best addressed by a randomised controlled trial. This would have two arms to compare current standard care (using hemiarthroplasty) with using large head total hip replacement for patients sustaining displaced intracapsular hip fractures. Primary outcome would be patient mobility at 1 year and secondary outcomes would include functional outcomes, quality of life and cost effectiveness of the intervention.

It would be expected that a sample size of approximately 500 patients would be required to show a significant difference in the mobility, hip function and quality of life (assuming 80% power $p < 0.05$). Recruiting centres through a trauma research network it is estimated that 10 centres would be able to recruit 20 patients per month (from 45 eligible patients) giving a recruitment period of 25 months.

4.4 *Intensive rehabilitation therapies after hip fracture*

What is the clinical and cost effectiveness of additional intensive physiotherapy and/or occupational therapy (for example progressive, resistance training) after hip fracture?

Why this is important

The rapid restoration of physical and self care functions is a critical to recovery from hip fracture, particularly where the goal is to return to the patient to pre-operative levels of function and residence. Approaches that are worthy of future development and investigation include progressive resistance training, progressive balance and gait training, supported treadmill gait re-training, dual task training, and Activities of Daily Living training. The optimal time point at which these interventions should be started requires clarification.

The ideal study design is a randomised controlled trial. Initial studies may have to focus on proof of concept and be mindful of costs. A phase III randomised controlled trial is required to determine effectiveness and cost effectiveness. The ideal sample size will be around 400–500 patients, and the primary outcome should be physical function and health-related quality of life. Outcomes should also include falls. A formal sample size calculation will need to be undertaken. Outcomes should be followed over a minimum of 1 year, and compare if possible, either the recovery curve for restoration of function or time to attainment of functional goals.

4.5 *Early supported discharge in care home patients*

What is the clinical and cost effectiveness of early supported discharge on mortality, quality of life and functional status in patients with hip fracture who are admitted from a care home?

Why this is important

Care and nursing homes residents account for 30% of all hip fracture patients admitted to hospital. Two-thirds of these come from care homes and the remainder from nursing homes. These patients are frailer, more functionally dependent and have a higher prevalence of cognitive impairment than patients admitted from their own homes. One-third of those admitted from a

care home are discharged to a nursing home and a fifth are readmitted to hospital within 3 months. There are no clinical trials to define the optimal rehabilitation pathway following hip fracture for these patients and therefore represent a discrete cohort where the existing meta-analyses do not apply. As a consequence, many are denied structured rehabilitation and are returned back to their care home or nursing home with very little or no rehabilitation input.

Given the patient frailty and comorbidities, rehabilitation may have no effect on clinical outcomes for this group. However, the fact that they already live in a home where they are supported by trained care staff, clearly provides an opportunity for a systematic approach to rehabilitation. Early multidisciplinary rehabilitation based in care homes or nursing homes would take advantage of the day-to-day care arrangements already in place and provide additional NHS support to deliver naturalistic rehabilitation, where problems are tackled in the patient's residential setting.

Early supported multidisciplinary rehabilitation could reduce hospital stay, improve early return to function, and affect both readmission rates and the level of NHS-funded nursing care required.

The research would follow a two-stage design: (1) an initial feasibility study to refine the selection criteria and process for reliable identification and characterisation of those considered most likely to benefit, together with the intervention package and measures for collaboration between the Hip Fracture Programme team, care-home staff and other community-based professionals, and (2) a cluster randomized controlled comparison (with, say, two or more intervention units and matched control units) set against agreed outcome criteria. The latter should include those specified above, together with measures of the impact on care-home staff activity and cost, as well as qualitative data from patients on relevant quality-of-life variables.

5 Other versions of this guideline

5.1 *Full guideline*

The full guideline, 'The management of hip fracture in adults' contains details of the methods and evidence used to develop the guideline. It is published by the National Clinical Guidelines Centre, and is available from (<http://www.ncgc.ac.uk>) and our website (www.nice.org.uk/guidance/CGXXguidance). **[Note: these details will apply to the published full guideline.]**

5.2 *Quick reference guide*

A quick reference guide for healthcare professionals is available from www.nice.org.uk/guidance/CGXXQuickRefGuide

For printed copies, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk (quote reference number N1XXX). **[Note: these details will apply when the guideline is published.]**

5.3 *'Understanding NICE guidance'*

A summary for patients and carers ('Understanding NICE guidance') is available from www.nice.org.uk/guidance/CGXXPublicInfo

For printed copies, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk (quote reference number N1XXX). **[Note: these details will apply when the guideline is published.]**

We encourage NHS and voluntary sector organisations to use text from this booklet in their own information about management of hip fractures.

6 Related NICE guidance

Published

- Delirium: diagnosis, prevention and management of delirium. NICE clinical guideline 103 (2010). Available from www.nice.org.uk/guidance/CG103
- Venous thromboembolism –prevention. NICE clinical guideline 92 (2010). Available from www.nice.org.uk/guidance/CG92

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- Surgical site infection. NICE clinical guideline 74 (2008). Available from www.nice.org.uk/guidance/CG74
- Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women. NICE technology appraisal guidance 161 (2008). Available from www.nice.org.uk/guidance/TA161
- Alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the primary prevention of osteoporotic fragility fractures in postmenopausal women. NICE technology appraisal guidance 160 (2008). Available from www.nice.org.uk/guidance/TA160
- Dementia: supporting people with dementia and their carers in health and social care. NICE clinical guideline 42 (2006) Available from www.nice.org.uk/guidance/CG42
- Nutrition support in adults. NICE clinical guideline 32 (2006). Available from www.nice.org.uk/guidance/CG32
- The management of pressure ulcers in primary and secondary care. NICE clinical guideline 29 (2005). Available from www.nice.org.uk/guidance/CG29
- Falls. NICE clinical guideline 21 (2004). Available from www.nice.org.uk/guidance/CG21
- Preoperative tests. NICE clinical guideline 3 (2003). Available from www.nice.org.uk/guidance/CG3
- The selection of prostheses for primary total hip replacement. NICE technology appraisal guidance 2 (2000). Available from www.nice.org.uk/guidance/TA2

Under development

NICE is developing the following guidance (details available from www.nice.org.uk):

- Osteoporosis. NICE clinical guideline. Publication date to be confirmed.

7 Updating the guideline

NICE clinical guidelines are updated so that recommendations take into account important new information. New evidence is checked 3 years after publication, and healthcare professionals and patients are asked for their views; we use this information to decide whether all or part of a guideline needs updating. If important new evidence is published at other times, we may decide to do a more rapid update of some recommendations.

Appendix A: The Guideline Development Group

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Appendix B: The Guideline Review Panel

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring adherence to NICE guideline development processes. In particular, the panel ensures that stakeholder comments have been adequately considered and responded to. The panel includes members from the following perspectives: primary care, secondary care, lay, public health and industry.

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Appendix C: The algorithm

An algorithm will be added before publication.