

## Surveillance proposal consultation document

### 2019 surveillance of [hip fracture: management](#) (NICE guideline CG124)

#### Surveillance proposal

We propose to update the guideline on [hip fracture: management](#) (NICE guideline CG124). The update will focus on recommendation 1.6.4, which currently suggests using a proven femoral stem design rather than Austin Moore or Thompson stems for arthroplasties. New evidence indicates that Thomson stems may be clinically equivalent to the Exeter/Unitrax stem. As such, this new evidence could change recommendation 1.6.4.

The following table gives an overview of how evidence identified in surveillance might affect each area of the guideline, including any proposed new areas.

Section of the guideline	New evidence identified	Impact
1.1 Imaging options in occult hip surgery	No	No
1.2 Timing of surgery	Yes	No
1.3 Analgesia	Yes	No
1.4 Anaesthesia	Yes	No
1.5 Planning the theatre team	No	No
1.6 Surgical procedures	Yes	Yes
1.7 Mobilisation strategies	Yes	No
1.8 Multidisciplinary management	Yes	No
1.9 Patient and carer information	No	No

## Reasons for the proposal to update the guideline

This section provides a summary of the areas proposed to be updated and the reasons for the proposal to update.

### 1.6 Surgical procedures

Recommendation 1.6.4 currently suggests using a proven femoral stem design rather than Austin Moore or Thompson stems. New evidence from a trial conducted in the UK as part of the [World Hip Trauma Evaluation Study](#) indicates that Thomson stems may be clinically equivalent to the Exeter/Unitrax stem.

During the development of the original guideline no randomised studies were found which compared older stem designs with modern stem designs in patients with hip fractures, thus evidence was extrapolated from studies looking at hip replacement implants in patients with degenerative disease alongside expert opinion. Furthermore, surveillance conducted in 2013 and 2015 did not find any studies that addressed this recommendation. This new evidence is directly applicable to addressing a gap in the evidence base which underpins recommendation 1.6.4 and as such this recommendation is proposed to be updated.

## Overview of 2019 surveillance methods

NICE's surveillance team checked whether recommendations in [hip fracture: management](#) (NICE guideline CG124) remain up to date.

The surveillance process consisted of:

- Feedback from topic experts via a questionnaire.
- A search for new or updated Cochrane reviews.
- Consideration of evidence from previous surveillance.
- Examining related NICE guidance and quality standards and NIHR signals.
- A search for ongoing research.
- Examining the NICE event tracker for relevant ongoing and published events.
- Literature searches to identify relevant evidence.
- Assessing the new evidence against current recommendations to determine whether or not to update sections of the guideline, or the whole guideline.
- Consulting on the proposal with stakeholders (this document).

For further details about the process and the possible update decisions that are available, see [ensuring that published guidelines are current and accurate](#) in developing NICE guidelines: the manual.

## Evidence considered in surveillance

### Search and selection strategy

We searched for new evidence related to the whole guideline.

We found 61 studies in a search for randomised controlled trials and Cochrane reviews published between 2 February 2015 and 31 May 2019. In addition to this 1 RCT was submitted by a clinician, which was published in June 2019.

There were also 89 studies identified by searches in [previous surveillance](#) in 2015 and 2013.

From all sources, we considered 151 studies to be relevant to the guideline.

See appendix A below for details of all evidence considered, and references.

### Selecting relevant studies

In line with surveillance methods for handling large volumes of studies, we included RCTs and Cochrane reviews of relevance to the guideline. Systematic reviews were only included if they addressed a specific gap in the evidence base or were identified as an important review (for example an NHRI signal).

### Ongoing research

We checked for relevant ongoing research; of the ongoing studies identified, 5 studies were assessed as having the potential to change recommendations. Therefore, we plan to check the publication status regularly and evaluate the impact of the results on current recommendations as quickly as possible. These studies are:

- [Comparing total hip arthroplasty and hemi-arthroplasty on revision surgery and quality of life in adults with displaced hip fractures: the HEALTH study](#). ISRCTN59890378
- [World hip trauma evaluation five: a randomised controlled trial comparing cemented and uncemented implants for the treatment of displaced intracapsular hip fractures](#). ISRCTN18393176
- [World hip trauma evaluation four](#). ISRCTN92825709
- [A randomised controlled trial of single antibiotic cement versus dual antibiotic cement in patients receiving a partial hip joint replacement after fracture](#). ISRCTN15606075
- [Community-based rehabilitation for the elderly following hip fracture](#). ISRCTN28376407.

## Intelligence gathered during surveillance

### Views of topic experts

We considered the views of topic experts who were recruited to the NICE Centre for Guidelines Expert Advisers Panel to represent their specialty. For this surveillance review, topic experts completed a questionnaire about developments in evidence, policy and services related to the guideline.

We sent questionnaires to 11 topic experts and received 2 responses. The topic experts had expertise in geriatric medicine and general practice. One expert did not think the NICE guideline should be updated but did not provide further comments. One expert suggested that the NICE guideline should be updated but did not provide a rationale for this. One expert highlighted that the [management of hip fracture in older people](#) SIGN guideline (2009) is proposed to be updated. As of 7<sup>th</sup> August 2019, the proposal for updating the SIGN guideline is listed as '[on hold](#)'.

### Implementation of the guideline

[Uptake data](#) from 2017/2018 indicates that the uptake of recommendations has been variable. Some of the well implemented recommendations are as follows: the proportion of arthroplasties which are cemented was 91.4% in 2018 (recommendation 1.6.5); the proportion of intramedullary nails used for subtrochanteric fractures was 89.3% in 2018 (recommendation 1.6.8); and the proportion of people with hip fracture who are mobilised out of bed the day after surgery was 73.3% (recommendation 1.7.1). The following recommendations were less well implemented: the proportion of people with displaced intracapsular fractures treated with total hip replacement if clinically eligible was 33.5% in 2018 (recommendation 1.6.3); the proportion of patients who had their pain re-evaluated during admission on the emergency department was 40% in 2017 (recommendation 1.3.1); and the proportion of emergency departments that have written information about hip fracture available for patient and/or their relatives and carers was 25% in 2017 (recommendation 1.9.1).

### Views of stakeholders

Stakeholders are consulted on all surveillance reviews except if the whole guideline will be updated and replaced. Because this surveillance proposal is to partially update the guideline, we are consulting with stakeholders.

See [ensuring that published guidelines are current and accurate](#) in developing NICE guidelines: the manual for more details on our consultation processes.

## Equalities

No equalities issues were identified during the surveillance process.

## Editorial amendments

During surveillance of the guideline we did not identify any editorial amendments.

## Overall surveillance proposal

After considering all evidence and other intelligence and the impact on current recommendations, we propose that a partial update is necessary.

# Appendix A: Summary of evidence from surveillance

## 2019 surveillance of [hip fracture: management \(2011\) NICE guideline CG124](#)

### Summary of evidence from surveillance

Studies identified in searches are summarised from the information presented in their abstracts, including studies extracted into tables.

Feedback from topic experts who advised us on the approach to this surveillance review, was considered alongside the evidence to reach a view on the need to update each section of the guideline.

Evidence from an evidence update for this topic was also considered. Evidence updates were produced by NICE to highlight new evidence relating to published NICE guidelines.

### 1.1 Imaging options in occult hip fracture

- 1.1.1 Offer magnetic resonance imaging (MRI) if hip fracture is suspected despite negative X-rays of the hip of an adequate standard. If MRI is not available within 24 hours or is contraindicated, consider computed tomography (CT). [2011, amended 2014]

### Surveillance proposal

No new information was identified at any surveillance review.

### Editorial amendments

There are no editorial amendments.

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#### Imaging options in occult hip fracture

#### 2013 surveillance summary

No relevant evidence was identified.

#### 2015 surveillance summary

No relevant evidence was identified.

#### 2019 surveillance summary

No relevant evidence was identified.

## Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

## Impact statement

There was no new evidence or intelligence found. The guideline recommendations will not be updated.

There was no new evidence.

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## 1.2 Timing of surgery

- 1.2.1 Perform surgery on the day of, or the day after, admission. [2011]
- 1.2.2 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. [2011]

### Surveillance proposal

This section of the guideline should not be updated.

### Editorial amendments

There were no editorial amendments.

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### Timing of surgery

#### 2013 surveillance summary

A meta-analysis (1) of 35 studies (n=191,873; mean age=80 years) found that early surgery (defined by most studies as within 24 or 48 hours) appeared to be associated with a statistically significantly lower mortality risk than delayed surgery.

#### 2015 surveillance summary

No relevant evidence was identified.

#### 2019 surveillance summary

One RCT (2) (n=400) of a prehospital fast-track care (patient transferred directly to radiology from the ambulance) compared with standard care (patient taken from ambulance to A&E) for patients with suspected hip fracture found a statistically significant reduction in time to x-ray, but not start of surgery, proportion operated on in 24 hours, length of stay, postoperative complications or mortality.

## Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

## Impact statement

One study found that ambulance initiated fast-track to radiology provided faster time to x-ray but did not impact upon longer-term outcomes such as time to operation, postoperative complications or mortality. One study found that early surgery was

associated with reduced mortality compared with delayed surgery. This evidence does not contradict current recommendations within this section of the guideline, or provide evidence that would create new recommendations. This section of the guideline will not be updated.

New evidence is unlikely to change guideline recommendations.

## 1.3 Analgesia

- 1.3.1 Assess the patient's pain:
- immediately upon presentation at hospital **and**
  - within 30 minutes of administering initial analgesia **and**
  - hourly until settled on the ward **and**
  - regularly as part of routine nursing observations throughout admission. **[2011]**
- 1.3.2 Offer immediate analgesia to patients presenting at hospital with suspected hip fracture, including people with cognitive impairment. **[2011]**
- 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. **[2011]**
- 1.3.4 Offer paracetamol every 6 hours pre-operatively unless contraindicated. **[2011]**
- 1.3.5 Offer additional opioids if paracetamol alone does not provide sufficient preoperative pain relief. **[2011]**
- 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. **[2011]**
- 1.3.7 Offer paracetamol every 6 hours postoperatively unless contraindicated. **[2011]**
- 1.3.8 Offer additional opioids if paracetamol alone does not provide sufficient postoperative pain relief. **[2011]**
- 1.3.9 Non-steroidal anti-inflammatory drugs (NSAIDs) are not recommended. **[2011]**

### Surveillance proposal

This section of the guideline should not be updated.

### Editorial amendments

There were no editorial amendments.

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## Analgesia

### 2013 surveillance summary

A meta-analysis (3) of 83 studies (mean age ranged from 59 to 86 years) found a statistically significant effect on acute pain

versus standard treatment (no blockade) for: epidural analgesia; femoral nerve blockade; psoas compartment nerve blockade; fascia iliac nerve blockade; and combined nerve blockades.

## 2015 surveillance summary

### Multimodal pain management

One RCT (4) of multimodal pain management versus usual care in patients undergoing bipolar hip hemiarthroplasty found that multimodal pain management had a lower pain level on postoperative days 1 and 4, and a lower total amount of fentanyl used.

### Nerve blocks

Three RCTs (5–7) found that nerve blocks statistically significantly reduced pain versus systemic analgesia, and reduced morphine use. One RCT (8) found that femoral nerve block provided statistically significantly superior preoperative analgesia and statistically significantly reduced need for morphine after the block, compared with fascia iliaca compartment block. One RCT (9) found that pain during positioning for spinal anaesthesia and time to perform anaesthesia were statistically significantly lower with femoral nerve block than fentanyl.

## 2019 surveillance summary

### Opioids

One RCT found transdermal buprenorphine statistically significantly superior to oral tramadol on a range of outcomes such as resting pain scores and pain on movement, see Table 1.

### Parecoxib

One RCT found no clear benefit of parecoxib plus propacetamol versus parecoxib, see Table 1.

### Nerve blocks

There was 1 Cochrane review and 10 RCTs of nerve blocks, see Table 1. Across the studies there was a trend that statistically significantly favoured nerve blocks for controlling pain, compared with no nerve blocks or conventional analgesia.

## Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

## Impact statement

### Multimodal pain management

The evidence from 1 RCT identified in the 2015 surveillance review indicates that multimodal pain relief is superior to usual care, but limited detail was available in the abstract to determine what the multimodal pain management entailed. Currently the guideline recommends immediate analgesia (recommendation 1.3.2), with a stepped approach to controlling pain ranging from paracetamol (recommendation 1.3.4), to opioids (recommendation 1.3.5) and on to nerve blocks (recommendation 1.3.6). The evidence does not contradict guideline recommendations.

New evidence is unlikely to change guideline recommendations.

### Opioids

The evidence from 1 RCT indicates that transdermal buprenorphine is superior to oral tramadol. However, the trial was only conducted in 50 patients. Currently the guideline recommendations do not provide specific advice on which opioid drugs to offer first, with recommendation 1.3.5

suggests offering additional opioids if paracetamol alone is not sufficient. This new evidence is not likely to change this recommendation or provide a more detailed recommendation on opioid drug choice.

New evidence is unlikely to change guideline recommendations.

### Parecoxib

The evidence from 1 RCT found no clear benefit of parecoxib plus propacetamol versus parecoxib. Currently the guideline does not recommend NSAIDs (recommendation 1.3.9), and this new evidence is unlikely to change the recommendation.

New evidence is unlikely to change guideline recommendations.

### Nerve blocks

The evidence from 16 studies identified across the 2015 and 2019 surveillance reviews found a trend that statistically significantly favoured nerve blocks for controlling pain, compared with no nerve blocks or conventional analgesia. This evidence is broadly in line with the guideline recommendation 1.3.6 which suggests adding nerve blocks if paracetamol and opioids do not provide sufficient pain relief.

New evidence is unlikely to change guideline recommendations.

**Table 1 Analgesia**

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>Opioids</b>							
Desai et al. (2017) (10)	RCT	50	Adult patients postoperatively following hip fracture surgery	Transdermal buprenorphine 10 mcg/h patch applied a day before the surgery	Oral tramadol 50 mg 3 times a day	Resting pain scores over 7 days; pain on movement over 7 days; rescue analgesia; incidence of vomiting; satisfaction scores	Statistically significantly favoured intervention
<b>Parecoxib</b>							
Camu et al. (2017) (11)	RCT	253	Adult patients after total hip arthroplasty	IV parecoxib 40 mg bid plus propacetamol 2 g once daily IV parecoxib 40 mg bid	IV propacetamol 2 g once daily Placebo	Morphine usage after 24 hours; pain	Parecoxib and parecoxib+propacetamol were superior to placebo but non-inferiority of parecoxib to parecoxib+propacetamol was not demonstrated

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>Nerve blocks</b>							
Guay et al. (2017) (12) (13)	Cochrane review	1,760; 31 trials	Adults aged 16 or older with hip fracture	Peripheral nerve blocks as preoperative analgesia, postoperative analgesia or to supplement anaesthesia	No regional blockade	Pain on movement within 30 mins; risk of pneumonia; time to first mobilisation	Statistically significantly favoured intervention
						Acute confusional state; death within 6 months; myocardial infarction	No statistically significant effect of intervention
Aprato et al. (2018) (14)	RCT	120	Adults aged >65 years with intracapsular hip fracture	Fascia iliaca compartment block pre-operatively	Intra-articular hip injection pre-operatively	Pain relief at 20 mins, 12 hours, 24 hours and 48 hours; use of oxycodone	Statistically significantly favoured control
Chaudet et al. (2016) (15)	RCT	60	Hip fracture patients	Single lidocaine injection and continuous femoral block (ropivacaine) pre-operatively	Single lidocaine injection and no continuous femoral block (saline infusion) pre-operatively	Total morphine consumption; pain scores	No statistically significant effect of intervention
						Morphine side-effects; nausea	Statistically significantly favoured intervention
Cooper et al. (2018) (16)	RCT	100	Patients with a fractured neck of femur	Ultrasound-guided femoral nerve block	Ultrasound-guided fascia iliaca compartment block	Pain scores	No statistically significant effect of intervention
Katcha et al. (2018) (17)	RCT	100	Patients aged 30 to 90 years with hip and proximal femur fractures prior to spinal anaesthesia	Fascia Iliaca Compartment Block 30 minutes before spinal anaesthesia	Sham block 30 minutes before spinal anaesthesia	Visual analogue scale measure of pain before and at time of spinal anaesthesia	Statistically significantly favoured intervention
Ma et al. (2018) (18)	RCT	88	Patients aged 80 or over with hip fracture complicated with at least one cardiovascular, neurological or pulmonary disease	Ultrasound-guided fascia iliaca compartment block	Traditional analgesia including 50 mg Tramadol and 500 mg paracetamol orally 3 times a day from admission to surgery	Visual analogue pain scores 1 hour after analgesia, and on morning of surgery; satisfaction with analgesia; duration of hospital stay; complications	Statistically significantly favoured intervention
Morrison et al. (2016) (19)	RCT	161	Patients with hip fracture	Ultrasound-guided, single-injection, femoral nerve block administered by emergency physicians at emergency	Conventional analgesics	Pain scores 2 hours after presenting and postoperative day 3; transfer out of bed; walking; walking distance 3 days; 6-week walking	Statistically significantly favoured intervention

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
				department admission followed by placement of a continuous fascia iliaca block by anaesthesiologists within 24 hours		and stair climbing; opioid side-effects	
Reavley et al. (2015) (20)	RCT	178	Patients over 18 years with femoral neck fractures	Fascia iliaca block	3-in-1 block	Visual analogue pain score at 60 minutes	No statistically significant effect of intervention
Rowlands et al. (2018) (21)	RCT	111	Older participants with fragility neck of femur fracture	Immediate continuous femoral nerve block via catheter	Standard analgesia	Cumulative Dynamic Pain Score; Cumulated Ambulation Score	No statistically significant effect of intervention
						Cumulative pain relief at rest	Statistically significantly favoured intervention
Unneby et al. (2017) (22)	RCT	266	Patients aged 70 or over with hip fracture, including those with dementia	Femoral nerve block	Conventional pain management	Visual analogue pain scores from baseline to 12 hours; opioid use	Statistically significantly favoured intervention
Wennberg et al. (2019) (23)	RCT	127	Patients with hip fracture, including cognitively impaired patients	Low-dose fascia iliaca compartment block plus conventional preoperative analgesia	Conventional preoperative analgesia	Visual analogue scale pain on movement	Statistically significantly favoured intervention

IV = intravenous. n = number of participants. RCT = randomised controlled trial.

## 1.4 Anaesthesia

- 1.4.1 Offer patients a choice of spinal or general anaesthesia after discussing the risks and benefits. [2011]
- 1.4.2 Consider intraoperative nerve blocks for all patients undergoing surgery. [2011]

### Surveillance proposal

This section of the guideline should not be updated.

### Editorial amendments

There were no editorial amendments in this section of the guideline.

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## Anaesthesia

### 2013 surveillance summary

No relevant evidence was identified.

### 2015 surveillance summary

#### General anaesthesia

An RCT (24) found that spinal anaesthesia provided better blood pressure stability than general anaesthesia. Two observational studies submitted by experts found no difference in 5-day or 30-day mortality between regional and general anaesthesia for hip fracture surgery, but hospital stay may be shorter with regional anaesthesia (25,26).

#### Depth of sedation

An RCT (27) found that mortality with light versus deep sedation was equivalent among all patients, however light sedation was safer than deep sedation among patients with serious comorbidities.

## 2019 surveillance summary

### General anaesthesia

There was 1 Cochrane review and 3 RCTs considering the role and type of general anaesthesia (see Table 2). One Cochrane review found that there was no clear advantage of regional versus general anaesthesia across outcomes such as mortality and length of hospital stay, but regional anaesthesia may reduce deep vein thrombosis incidence. One RCT found an advantage of general laryngeal mask airway anaesthesia with lumbar plexus-sciatic nerve block compared with general anaesthesia with endotracheal intubation. One RCT found no difference of xenon anaesthesia compared with sevoflurane-based anaesthesia for fatal adverse events and delirium, but benefits in terms of serious adverse events. One RCT found an advantage of using SmartPilot view guided anaesthesia, compared with usual practice, in terms of outcomes such as length of stay and postoperative complications.

### Spinal anaesthesia

There were 3 studies considering the dose and drug choice for spinal anaesthesia (see Table 2). Two RCTs considering the dose of bupivacaine found inconsistent effects, with benefits of both lower and higher doses. One RCT found levobupivacaine superior to bupivacaine for some outcomes, although the trial was only in a small number of participants.

### Depth of sedation

There were 2 publications from 1 RCT considering the depth of sedation for spinal anaesthesia, which found no clear benefits of lighter depth sedation on mortality or delirium (see Table 2).

### Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

### Impact statement

#### General anaesthesia

Evidence from 5 studies considering the role and type of general anaesthesia were generally consistent with recommendation 1.4.1 that patients should be offered a choice of spinal or general anaesthesia after discussing the risks and benefits. A Cochrane review identified that across most outcomes regional and spinal anaesthesia were equivalent. Three trials found some benefits of specific techniques such as general laryngeal mask compared with endotracheal intubation, xenon anaesthesia compared with sevoflurane anaesthesia, and SmartPilot view guided anaesthesia compared with usual care. Currently the guideline does not provide advice on specific anaesthetic techniques,

and this new evidence does not appear sufficient to warrant an update to the guideline. This section of the guideline will be revisited at subsequent surveillance time points to see if further evidence has become available that provides a stronger case for update.

New evidence is unlikely to change guideline recommendations.

#### Spinal anaesthesia

Evidence from 3 RCTs considering the dose and type of spinal anaesthesia were generally consistent with recommendation 1.4.1 that patients should be offered a choice of spinal or general anaesthesia after discussing the risks and benefits. Two RCTs considering the dose of bupivacaine found inconsistent effects. One RCT found levobupivacaine superior to bupivacaine for some outcomes, although the trial was only in a small number of participants. Currently the guideline does not provide specific recommendations on drug and dose for spinal anaesthesia and this new evidence does not appear sufficient to warrant an update to the guideline. This section of the guideline will be revisited at subsequent surveillance time points to see if further evidence has become available that provides a stronger case for update.

New evidence is unlikely to change guideline recommendations.

#### Depth of sedation

Across the surveillance time points there was evidence from 2 RCTs considering the depth of sedation for spinal anaesthesia, which found no clear benefits of lighter depth sedation on mortality or delirium (see Table 2). This new evidence is unlikely

to impact on the recommendations as the guideline does not provide advice on the depth of anaesthesia.

New evidence is unlikely to change guideline recommendations.

**Table 2 Anaesthesia**

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>General anaesthesia</b>							
Guay et al. (2016) (28)	Cochrane review	3,231; 31 trials	Adults undergoing hip fracture surgery	General anaesthetic	Regional anaesthetic	Risk of deep vein thrombosis without heparin administration	Statistically significantly favoured control
						Acute confusional state; pneumonia; cerebrovascular incident; myocardial infarction; mortality at 1 month; length of hospital stay	No statistically significant effect of intervention
Chen et al. (2018) (29)	RCT	63	Elderly patients having open reduction internal fixation of an intertrochanteric fracture	General laryngeal mask airway anaesthesia with lumbar plexus-sciatic nerve block	General anaesthesia with endotracheal intubation	Systolic blood pressure; diastolic blood pressure; mean arterial pressure at least one episode of significant hypotension; complications; weaning time; returns to intensive care; postoperative pain	Statistically significantly favoured intervention
Coburn et al. (2018) (30)	RCT	256	Patients 75 years and over with hip fracture	Xenon anaesthesia	Sevoflurane-based anaesthesia	Incidence of delirium; fatal adverse events	No statistically significant effect of intervention
						Incidence of serious adverse events; postoperative sequential organ failure assessment	Statistically significantly favoured intervention
Leblanc et al. (2017) (31)	RCT	100	Patients undergoing hip fracture surgery with general anaesthesia	Anaesthesia was guided using SmartPilot view with predefined targets (propofol, sufentanil and desflurane)	Usual practice for determining dosage of anaesthesia (propofol, sufentanil and desflurane)	Cumulative time of low systolic blood pressure; moderate or severe postoperative complications at 30 days; length of hospital stay	Statistically significantly favoured intervention

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>Spinal anaesthesia</b>							
Kahoul et al. (2017) (32)	RCT	108	Patients undergoing hip fracture surgery with unilateral spinal anaesthesia	5mg hypobaric bupivacaine	7.5mg hypobaric bupivacaine	Efficiency rates	No statistically significant effect of intervention
						Mean onset; lower regression time; bilateralization; hypotensive episodes; vascular loading	Statistically significantly favoured intervention
Sedighinejad et al. (2018) (33)	RCT	292	Patients undergoing hip fracture surgery	10 mg of hyperbaric 0.5% Bupivacaine	5 mg hyperbaric Bupivacaine 0.5% plus 50 mg Lidocaine 5%	Onsets of sensory and motor blocks; durations of sensory and motor blocks; systolic blood pressure; episodes of hypotension, bradycardia, nausea and vomiting	Statistically significantly favoured intervention
Vives et al. (2019) (34)	RCT	58	Patients aged 70 or older undergoing hip fracture surgery	Levobupivacaine	Bupivacaine	Level of sensory block at surgery start; level of motor block after 15 minutes; neurological complications such as agitation, disorientation and confusional state	Statistically significantly favoured intervention
						Postoperative Short Portable Mental Status Questionnaire	No statistically significant effect of intervention
<b>Depth of sedation</b>							
Sieber et al. (2018 and 2019) (35) (36)	RCT	200	Patients 65 years or over without preoperative delirium or severe dementia undergoing hip fracture surgery	Heavier depth of sedation with propofol (modified observer's assessment of sedation score of 0-2) spinal anaesthesia	Lighter depth of sedation with propofol (modified observer's assessment of sedation score of 3-5) spinal anaesthesia	Mortality at 1-year; ambulation return at 1 year; incidence of delirium	No statistically significant effect of intervention
n = number of participants. RCT = randomised controlled trial. DVT = deep vein thrombosis.							

## 1.5 Planning the theatre team

- 1.5.1 Schedule hip fracture surgery on a planned trauma list. [2011]
- 1.5.2 Consultants or senior staff should supervise trainee and junior members of the anaesthesia, surgical and theatre teams when they carry out hip fracture procedures. [2011]

### Surveillance proposal

No new information was identified at any surveillance review.

### Editorial amendments

There were no editorial amendments.

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### Planning the theatre team

#### 2013 surveillance summary

No relevant evidence was identified.

#### 2015 surveillance summary

No relevant evidence was identified.

#### 2019 surveillance summary

No relevant evidence was identified.

### Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

### Impact statement

There was no new evidence or intelligence found. The guideline recommendations will not be updated.

There was no new evidence.

## 1.6 Surgical procedures

### Hip replacement

- 1.6.1 Operate on patients with the aim to allow them to fully weight bear (without restriction) in the immediate postoperative period. [2011]
- 1.6.2 Offer replacement arthroplasty (total hip replacement or hemiarthroplasty) to patients with a displaced intracapsular hip fracture. [2017]
- 1.6.3 Offer total hip replacement rather than hemiarthroplasty to patients with a displaced intracapsular hip fracture who:
- were able to walk independently out of doors with no more than the use of a stick **and**
  - are not cognitively impaired **and**
  - are medically fit for anaesthesia and the procedure. [2017]

### Surveillance proposal

These recommendations should not be updated.

### Editorial amendments

There were no editorial amendments.

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### Hip replacement

Recommendations 1.6.2 and 1.6.3 were updated in 2017 and full details are available in the [Full guideline addendum](#). The review questions that were updated were:

- What is the clinical and cost effectiveness of internal fixation compared with hemiarthroplasty compared with total hip replacement in people undergoing repair for a displaced intracapsular hip fracture?
- What is the clinical and cost effectiveness of conservative management compared with internal fixation compared with hemiarthroplasty compared with total

hip replacement in people with an undisplaced intracapsular hip fracture?

Two studies identified during the 2013 surveillance process (37,38), and 16 studies identified during the 2015 surveillance process were available for consideration during update. (39,40,49–55,41–48).

### 2019 surveillance summary

One RCT with a 12 year follow up compared cemented hemiarthroplasty with cemented total hip replacement in 252 active patients aged >70 years with a displaced intracapsular fracture of the femoral neck was identified. (56) The trial found no statistically significant difference between groups in terms of mortality,

revision rate, complications and Harris Hip scores, however the follow up had small numbers at 12 years.

One RCT (57) (n=120 patients) of hemiarthroplasty compared with total hip arthroplasty for displaced femoral neck fractures found no statistically significant difference in terms of hip function, pain in the involved hip, health related quality of life, hip-related complications and reoperations, or daily living activities up to 2 years after surgery.

### Impact statement

Recommendations 1.6.2 and 1.6.3 were updated in 2017 and full details are available in the [Full guideline addendum](#).

Two RCTs in patients with a displaced fracture of the femoral neck were identified in the 2019 surveillance process,

which showed no difference between arthroplasty and total hip replacement for displaced fractures of the femoral neck. A further larger RCT looking at total hip replacement versus hemiarthroplasty (the [HEALTH study](#)) is completed but publication date is unknown.

This new evidence does not contradict recommendation 1.6.2 which suggests offering replacement arthroplasty (total hip replacement or hemiarthroplasty) to patients with a displaced intracapsular hip, or sufficient to contradict recommendation 1.6.3 which outlines when a total hip replacement may be appropriate. As such, no update to these recommendations is suggested at this time.

New evidence is unlikely to change guideline recommendations.

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## Types of implant

- 1.6.4 Use 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. [2011]

### Surveillance proposal

Recommendation 1.6.4 should be updated as new evidence indicates that Thompson hemiarthroplasty may be equivalent to Exeter/Unitrax stem and head.

### Editorial amendments

There were no editorial amendments.

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## Types of implant

### 2013 surveillance summary

No relevant evidence was identified.

### 2015 surveillance summary

No relevant evidence was identified.

### 2019 surveillance summary

The WHiTE3 RCT of 964 patients with displaced intracapsular hip fractures showed no statistically significant difference between Thomson hemiarthroplasty and Exeter/Unitrax head and stem in terms of mortality, mobility or EQ-5D scores. (58)

### Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

### Impact statement

One large RCT showed no difference between Thomson hemiarthroplasty and Exeter/Unitrax hemiarthroplasty for displaced intracapsular fractures. This trial was conducted in the UK and is part of the

### [World Hip Trauma Evaluation Study.](#)

Currently recommendation 1.6.4 suggests using a proven femoral stem design rather than Austin Moore or Thompson stems. This new evidence indicates that Thomson stems may be equivalent to the Exeter/Unitrax stem and head. Thomson stems are cheaper than Exeter stems so this may save costs whilst maintaining equivalent outcomes.

During the development of the original guideline, this recommendation was based on studies looking at hip replacement implants in patients with degenerative disease alongside expert opinion, as no randomised studies were found which compared older stem designs with modern stem designs in patients with hip fractures. Furthermore, surveillance conducted in 2013 and 2015 did not find any studies that addressed this recommendation.

This new evidence is directly applicable to addressing a gap in the evidence base which underpins recommendation 1.6.4 and therefore, it is proposed that this section is updated.

**New evidence identified that may change current recommendations.**

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## Cemented implants

1.6.5 Use cemented implants in patients undergoing surgery with arthroplasty.\* [2011]

\* The Association of Anaesthetists of Great Britain and Ireland, British Orthopaedic Association and British Geriatric Society have produced a [safety guideline on reducing the risk from cemented hemiarthroplasty for hip fracture](#) (2015). This safety guideline is not NICE accredited.

### Surveillance proposal

This recommendation should not be updated.

## Editorial amendments

There were no editorial amendments.

## Cemented implants

### 2013 surveillance summary

Evidence from 3 studies (59–61) indicated that functional outcomes and pain appeared to be equivalent with cemented and uncemented hemiarthroplasty, and that risk of death may be lower with cemented implants.

### 2015 surveillance summary

During the 2017 surveillance process there were 4 RCTs and 3 meta-analyses, as well as 2 observational studies submitted by experts (62–70). Cemented implants were superior to uncemented implants across most outcomes including pain, mobility and functioning, but there were safety concerns with cemented implants.

### 2019 surveillance summary

There were 5 trials of cemented versus uncemented stems, which showed a trend

statistically significantly favouring cemented implants for some outcomes, see Table 3.

### Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

### Impact statement

Evidence from 17 studies of cemented versus uncemented stems generally favoured cemented stems. This evidence supports recommendation 1.6.5 which suggests using cemented implants in patients undergoing surgery with arthroplasty.

New evidence is unlikely to change guideline recommendations.

**Table 3 Cemented implants**

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
Barenus et al. (2018) (71)	RCT with 4 year follow up	141	Displaced fracture of the hip	Cemented stem	Uncemented stem Total hip replacement	Functional outcome; mortality; radiological outcomes	No statistically significant effect of intervention
						Surgery for periprosthetic fracture	Statistically significantly favoured intervention

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
Chammout et al. (2017) (72)	RCT	69	Patients aged 65-79 years treated with total hip replacement for displaced femoral neck fractures	Cemented femoral stem	Uncemented stem	Hip-related complications	Statistically significantly favoured intervention (trial stopped early)
Inngul et al. (2015) (73)	RCT	141	Patients aged >65 with displaced fracture of the femoral neck	Cemented femoral stem	Uncemented stem	Harris hip score at 4 months; short musculoskeletal assessment questionnaire at 4 and 12 months; EQ-5D scores at 4 and 12 months	Statistically significantly favoured intervention
Moerman et al. (2017) (74)	RCT	201	Patients aged 70 or over with displaced femoral neck fractures	Cemented hemiarthroplasty	Uncemented hemiarthroplasty	Major local complications; physical component SF-12	Statistically significantly favoured intervention
						Operation time; functional outcomes; Groningen Activity Restriction Scale; mid-thigh pain	No statistically significant effect of intervention
Vidovic et al. (2015) (75)	RCT	60	Elderly patients with femoral neck fracture	Cemented hemiarthroplasty	Uncemented hemiarthroplasty	Morbidity; mortality; hospital stay	No statistically significant effect of intervention
						Implantation time; functional score	Statistically significantly favoured intervention

n = number of participants. RCT = randomised controlled trial.

## Surgical approach

1.6.6 Consider an anterolateral approach in favour of a posterior approach when inserting a hemiarthroplasty. [2011]

## Surveillance proposal

This recommendation should not be updated.

## Editorial amendments

There were no editorial amendments.

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## Surgical approach

### 2013 surveillance summary

No relevant evidence was identified.

### 2015 surveillance summary

One RCT (76) found that mobility after 5 days and pain intensity after 16 days were statistically significantly improved with a minimally invasive (direct anterior) compared to a conventional (Watson-Jones anterolateral) approach.

### 2019 surveillance summary

One RCT of 190 elderly patients with femoral neck fractures showed no statistically significant difference between minimally invasive anterior muscle-sparing approach for hemiarthroplasty, compared with lateral hardening or transgluteral approach in terms of median duration of timed up and go at 3 weeks, blood

transfusion, or soft tissue complications. (77)

### Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

### Impact statement

Evidence from 2 RCTs showed mixed results of minimally invasive approach compared with lateral approach. Recommendation 1.6.6 suggests using an anterolateral approach in preference to a posterior approach when inserting a hemiarthroplasty. This new evidence does not contradict this recommendation or provide greater clarity on which approach to use.

New evidence is unlikely to change guideline recommendations.

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## Type of fixation

- 1.6.7 Use extramedullary implants such as a sliding hip screw in preference to an intramedullary nail in patients with trochanteric fractures above and including the lesser trochanter (AO classification types A1 and A2). [2011]
- 1.6.8 Use an intramedullary nail to treat patients with a subtrochanteric fracture. [2011]

\* The Association of Anaesthetists of Great Britain and Ireland, British Orthopaedic Association and British Geriatric Society have produced a safety guideline on reducing the risk from cemented hemiarthroplasty for hip fracture (2015). This safety guideline is not NICE accredited.

## Surveillance proposal

These recommendations should not be updated.

## Editorial amendments

There were no editorial amendments.

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### Type of fixation

#### 2013 surveillance summary

An RCT (78) found no statistically significant differences between sliding hip screw and intramedullary nail for trochanteric fracture for most outcomes, including total hospital stay, mortality or pain.

#### 2015 surveillance summary

##### Screw and nail fixation

Eleven RCTs and 6 meta-analyses of various types of screw fixation for hip fracture found mixed results or non-statistically significant results (79,80,89–95,81–88). Two observational studies and a before and after study were also submitted by experts (96–98).

##### Intramedullary / extramedullary fixation

Three RCTs and 2 Cochrane reviews were found (99–103). The Cochrane reviews found insufficient evidence to determine differences between designs of intramedullary nails for extracapsular hip fractures, or the use of external fixators.

#### 2019 surveillance summary

##### Screw and nail fixation

There were 7 RCTs looking at various types of screw and nail fixation methods for a range of hip fracture types, see Table 4. The results were generally mixed or non-significant, although differences in

populations and interventions makes comparisons difficult.

##### Intramedullary fixation

There were 4 RCTs looking at various methods and types of intramedullary fixation for a range of hip fracture types, see Table 4. The results were generally mixed or non-significant, although differences in populations and interventions makes comparisons difficult.

### Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

### Impact statement

Evidence from 17 studies looking at various types of screw, nail fixation, or intramedullary/extramedullary options for a range of hip fracture types found generally mixed or non-statistically significant results although the lack of detail in abstracts made it difficult to compare across studies. Currently recommendations 1.6.7 and 1.6.8 suggest using extramedullary implants such as sliding hip screw in patients with trochanteric fractures, and intramedullary nail for patients with subtrochanteric fractures. This new evidence does not contradict these recommendations or provide greater clarity on which approach to take.

New evidence is unlikely to change guideline recommendations.

**Table 4 Type of fixation**

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>Screw and nail fixation</b>							
Berger-Groch et al. (2016) (104)	RCT	104	Intertrochanteric femur fractures	Cephalomedullary nail with a 2-screw	Cephalomedullary nail with a single screw	Functional outcome, hospital stay	Statistically significantly favoured intervention
						Functional outcomes and implant-related complications at 5 years	No statistically significant effect of intervention
Bretherton et al. (2016) (105)	RCT	844 randomised; 538 at 1 year	Trochanteric Hip Fractures	Sliding Hip Screw	Intramedullary Nail	Femoral medialisation	Statistically significantly favoured control
Dolatowski et al. (2019) (106)	RCT	119	Patients aged 70 or over with a non-displaced femoral neck fracture	Screw fixation	Hemiarthroplasty	Hip function at 24 months; mortality at 24 months	No statistically significant effect of intervention
						Mobility at 24 months; major re-operation	Statistically significantly favoured control
Faith trial investigators (2017) (107)	RCT	1108	Patients aged 50 years or older with a low-energy hip fracture requiring fracture fixation	Single large-diameter screw with a side-plate (sliding hip screw)	Multiple small-diameter cancellous screws	Re-operation within 24 months; medically related adverse events; sepsis; pulmonary embolism	No statistically significant effect of intervention
						Avascular necrosis	Statistically significantly favoured control
Lilly et al. (2018) (108)	RCT	50	Patients with intertrochanteric femur fractures being treated	Computer-assisted navigation for intramedullary nail fixation	Conventional fluoroscopic technique for lag screw placement	Tip to apex distance; radiation exposure	No statistically significant effect of intervention

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
			with intramedullary nail fixation by experienced surgeons			Surgical time	Statistically significantly favoured control
Parker et al. (2017) (109)	RCT	400	Trochanteric hip fracture	Sliding hip screw	Cephalomedullary nail	Fracture healing complications; postoperative blood transfusion; wound healing complications; general medical complications; hospital stay; mortality; Recovery of mobility at 6 and 12 months	No statistically significant effect of intervention
						Recovery of mobility at 8 weeks, 3 months and 9 months; surgical time	Statistically significantly favoured control
Sanders et al (2017) (110)	RCT	249	Patients 55 years or older with hip fractures	Sliding hip screw	InterTAN intramedullary device	Limb shortening greater than 2cm	Statistically significantly favoured control
Zehir et al. (2015) (111)	RCT	68	Patients with unstable trochanteric fracture	Proximal femoral nail antirotation	Dynamic hip screw	Operative time; fluoroscopy time	Statistically significantly favoured intervention
						Complication rates; recovery of walking ability; 3-year survival rate	No statistically significant effect of intervention
<b>Intramedullary fixation</b>							
Cai et al. (2016) (112)	RCT	198	Stable intertrochanteric fractures	Intramedullary fixation	Extramedullary fixation	Total and hidden perioperative blood loss	Statistically significantly favoured control
						Observed blood loss; functional recovery; time to union; complications	No statistically significant effect of intervention
Li et al. (2015) (113)	RCT	59	Patients over the age of 65 with pertrochanteric fractures	Intramedullary nails with distal locking	Intramedullary nails without distal locking	Operation time; blood loss; fluoroscopy time; total length of incision	Statistically significantly favoured control

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
						Postoperative complications; fracture union	No statistically significant effect of intervention
Sahin et al. (2016) (114)	RCT	72	Elderly patients with unstable intertrochanteric femur fractures	Traction table for intramedullary nailing	Manual traction for intramedullary nailing	Medium number of assistants  Positioning and preparation period; total anaesthesia time	Statistically significantly favoured intervention  Statistically significantly favoured control
n = number of participants. RCT = randomised controlled trial.							

## 1.7 Mobilisation strategies

- 1.7.1 Offer patients a physiotherapy assessment and, unless medically or surgically contraindicated, mobilisation on the day after surgery. [2011]
- 1.7.2 Offer patients mobilisation at least once a day and ensure regular physiotherapy review. [2011]

### Surveillance proposal

This section of the guideline should not be updated.

### Editorial amendments

There were no editorial amendments.

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## Mobilisation strategies

### 2013 surveillance summary

A Cochrane review (115) was found which identified 1 trial assessing early assisted ambulation (within 48 hours) versus delayed assisted ambulation (after 48 hours) after surgery. However, this study had already been included in the guideline evidence review.

### 2015 surveillance summary

No relevant evidence was identified.

### 2019 surveillance summary

Three RCTs found that various forms of more intensive physiotherapy had some improvements in shorter term outcomes, such as functional assessment and length of hospital stay, see Table 5 for an overview of studies.

## Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

## Impact statement

Three RCTs identified during the 2019 surveillance review process found that various forms of more intensive physiotherapy had some improvements in shorter term outcomes, such as functional assessment and length of hospital stay. One trial indicated that 3 times daily physiotherapy was superior to once daily physiotherapy in terms of length of stay and discharge probability, but did not affect 6 month outcomes. This evidence does not contradict recommendation 1.7.2 which currently recommends offering early mobilisation at least once a day. As such, the guideline recommendations will not be updated.

New evidence is unlikely to impact guideline recommendations

**Table 5 Mobilisation strategies**

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<i>Intensive physiotherapy</i>							
Kimmel et al. (2016) (116)	RCT	92	Patients aged 65 years or over with isolated hip fractures	Intensive physiotherapy (3 x daily)	Usual care once daily physiotherapy	Modified lowa Level of Assistance; hospital length of stay; probability of discharge	Statistically significantly favoured intervention
						Re-admission; complication rates; 6-month outcomes (unclear which outcomes from abstract)	No statistically significant effect with intervention
Kronberg et al. (2017) (117)	RCT	90	Patients with hip fracture	Additional progressive knee-extension strength training plus usual daily physiotherapy	Usual daily physiotherapy	Change in maximal isometric knee-extension strength in the fractured limb	No statistically significant effect with intervention
Stasi et al. (2019) (118)	RCT	96	Patients with hip fracture	Intensive abductor muscle exercise program	Standard physiotherapy intervention	Abductors' isometric strength; abductor ratio%; functional assessment	Statistically significantly favoured intervention

## 1.8 Multidisciplinary management

- 1.8.1 From admission, offer 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 wellbeing
  - continued, coordinated, orthogeriatric and multidisciplinary review
  - liaison or integration with related services, particularly mental health, falls prevention, bone health, primary care and social services
  - clinical and service governance responsibility for all stages of the pathway of care and rehabilitation, including those delivered in the community. **[2011]**
- 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. **[2011]**
- 1.8.3 Healthcare professionals should deliver care that minimises the patient's risk of delirium and maximises their independence, by:
- actively looking for cognitive impairment when patients first present with hip fracture
  - reassessing patients to identify delirium that may arise during their admission
  - offering individualised care in line with NICE's guideline on [delirium](#). **[2011]**
- 1.8.4 Consider early supported discharge as part of the Hip Fracture Programme, provided the Hip Fracture Programme multidisciplinary team remains involved, and the patient:
- is medically stable and
  - has the mental ability to participate in continued rehabilitation and
  - is able to transfer and mobilise short distances and
  - has not yet achieved their full rehabilitation potential, as discussed with the patient, carer and family. **[2011]**

- 1.8.5 Only consider intermediate care (continued rehabilitation in a community hospital or residential care unit) if all of the following criteria are met:
- intermediate care is included in the Hip Fracture Programme **and**
  - the Hip Fracture Programme team retains the clinical lead, including patient selection, agreement of length of stay and ongoing objectives for intermediate care **and**
  - the Hip Fracture Programme team retains the managerial lead, ensuring that intermediate care is not resourced as a substitute for an effective acute hospital Programme. [2011]
- 1.8.6 Patients admitted from care or nursing homes should not be excluded from rehabilitation programmes in the community or hospital, or as part of an early supported discharge programme. [2011]

## Surveillance proposal

This section of the guideline should not be updated.

## Editorial amendments

There were no editorial amendments.

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## Multidisciplinary management

### 2013 surveillance summary

No relevant evidence was identified.

### 2015 surveillance summary

#### 'Orthogeriatrician' care

Two meta-analyses (119,120) and 7 RCTs (121–127) found that generally the combination of orthopaedic and geriatric care led to improvements in a range of outcomes, including delirium, length of stay, and mortality rate.

#### Rehabilitation

##### Patient-centred counselling in hospital

An RCT (128) found that anxiety and depression had statistically significantly

decreased after 30 days, and pain levels were statistically significantly lower on days 4 and 5 with counselling than among patients not receiving counselling.

##### Anabolic steroids for rehabilitation

A Cochrane review (129) of 3 trials found some functional improvement in people receiving anabolic steroids plus a nutritional supplement for rehabilitation after hip fracture, but the authors noted a high or uncertain risk of bias in studies.

##### Home and community based rehabilitation

An RCT (130) and a meta-analysis (131) found that home or community based rehabilitation reduced perceived difficulties in negotiating stairs and improved knee-extension strength, physical performance-based tests, timed 'up & go' test and fast gait speed.

## 2019 surveillance summary

One systematic review and 10 RCTs were found that were of relevance to this section of the guideline.

### 'Orthogeriatrician' care

One Cochrane review found that, compared with usual care, comprehensive geriatric assessment provided some statistically significant benefits in terms of mortality and discharge, but did not impact on other outcomes such as delirium or re-admission. A systemic review found that comprehensive geriatric assessment statistically significantly reduced delirium but not other outcomes. One RCT found that, compared with orthopaedic care, comprehensive geriatric care in a dedicated ward statistically significantly improved some functional outcomes, such as mobility at 4 months. See Table 6 for a summary of studies.

### Postoperative orders

One RCT found that, compared with usual care, delirium-friendly printed postoperative orders statistically significantly improved delirium but did not impact upon mortality or discharge, see Table 6.

### Rehabilitation

#### Enhanced rehabilitation for dementia

One Cochrane review found that, compared with usual care, enhanced rehabilitation statistically significantly improved some outcomes such as complications, but did not impact on delirium or functional outcomes, see Table 6.

#### Physical or geriatric rehabilitation

One RCT found that, compared with

health centre hospital rehabilitation, physical rehabilitation statistically significantly improved 12 month mortality, and both physical rehabilitation and geriatric rehabilitation statistically significantly improved independent living at 12 months, see Table 6.

#### Home and community rehabilitation

Three RCTs found mixed results of home and nursing home rehabilitation, compared with usual care. See Table 6 for an overview of studies.

## Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

## Impact statement

### 'Orthogeriatrician' care

Across the surveillance time points, 11 studies indicated that comprehensive geriatric assessment and/or care provides some benefits in terms of mortality, delirium, and discharge, but the results were not consistent across studies. It should be noted that the type of orthogeriatrician care varied from simple assessment to dedicated wards, which makes interpreting results across studies difficult. However, this new evidence generally supports recommendation 1.8.1 that states that patients should be offered a package of care that includes orthogeriatric assessment. As such, this section of the guideline should not be updated.

New evidence is unlikely to change guideline recommendations.

## Postoperative orders

One RCT found that delirium-friendly printed postoperative orders improved delirium but did not impact upon mortality or discharge. Currently recommendation 1.8.3 states that delirium should be reassessed during admission and individualised care offered in line with NICE's guideline on [delirium](#). This new evidence does not contradict that and as such no impact on the guideline is expected.

New evidence is unlikely to change guideline recommendations.

## Rehabilitation

Across the surveillance time points, 12 studies provided a mixed picture of the effects of various different types of rehabilitation packages, including home rehabilitation, specific knee-strengthening training, anabolic steroids for rehabilitation, and rehabilitation packages specifically tailored to people with dementia. The impact of each specific type of rehabilitation package is discussed separately below.

### Patient-centred counselling in hospital

An RCT found that patient-centred counselling throughout hospitalisation for hip fracture had a positive impact on quality of life, anxiety, depression and pain levels. Although the guideline does not specifically recommend counselling, this evidence is consistent with recommendation 1.8.1 that the Hip Fracture Programme should include liaison or integration with related services, including mental health.

### Anabolic steroids for rehabilitation

A Cochrane review demonstrated some functional improvement in people receiving anabolic steroids plus a nutritional supplement for rehabilitation after hip fracture. However, because of the reported high or unclear risk of bias in all trials, the imprecise results and the likelihood of publication bias, the evidence is unlikely to impact on CG124 which does not currently discuss the use of anabolic steroids as part of rehabilitation.

### Enhanced rehabilitation for dementia

An RCT found that enhanced rehabilitation improved some outcomes such as complications, but did not impact on delirium or functional outcomes. This evidence does not contradict recommendation 1.8.1 which currently recommends early identification of individual goals for multidisciplinary rehabilitation to recover mobility and independence, and to facilitate return to pre-fracture residence and long-term wellbeing.

### Physical or geriatric rehabilitation

One RCT found that physical rehabilitation improved 12 month mortality, and both physical rehabilitation and geriatric rehabilitation statistically significantly improved independent living at 4 months. However, the authors reported that the effects disappeared at 12 months, and there was no impact on walking ability. This evidence does not contradict recommendation 1.8.1 which currently recommends early identification of individual goals for multidisciplinary rehabilitation to recover mobility and independence, and to facilitate return to pre-fracture residence and long-term wellbeing.

### Home and community rehabilitation

Four RCTs and a meta-analysis found mixed results of home and nursing home rehabilitation, compared with usual care. Currently recommendation 1.8.4 advises that early supported discharge should be considered for appropriate patients (including those who are medically stable, have the appropriate mental ability, can transfer and mobilise short distances, and have not yet achieved full rehabilitation

potential). This recommendation was based on committee extrapolation and interpretation of an evidence review of community based rehabilitation and economic modelling. This new evidence appears to be generally in line with previous evidence and as such no impact on the guideline is expected.

New evidence is unlikely to change guideline recommendations.

**Table 6 Multidisciplinary management**

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>'Orthogeriatric' care</b>							
Eamer et al. (2018) (132)	Cochrane review	1,583; 7 trials*	Adults recovering from hip fracture surgery	Comprehensive geriatric assessment	Standard care	Mortality; discharge to an increased level of care	Statistically significantly favoured intervention
						Major postoperative complications; re-admission rates; delirium	No statistically significant effect with intervention / uncertain effect with intervention
Prestmo et al. (2015) (133) Taraldson et al. (2015) (134)	RCT	397	Home-dwelling patients aged 70 or older with hip fracture	Comprehensive geriatric care in dedicated ward	Orthopaedic care in the emergency department	Mobility at 4 months measured with the Short Physical Performance Battery; upright time at 4 and 12 months; average and maximum length of upright events	Statistically significantly favoured intervention
Shields et al. (2017) (135)	Systematic review	973; 4 trials	Hip fracture	Comprehensive geriatric assessment – ward-based models on geriatric wards	Visiting team based models on orthopaedic wards	Delirium overall	Statistically significantly favoured intervention
						Secondary outcomes (not stated)	No statistically significant effect of intervention

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>Postoperative orders</b>							
Freter et al. (2017) (136)	RCT	283	Individuals with hip fracture	Delirium-friendly printed postoperative orders	Routine orders	Delirium; delirium in individuals with dementia	Statistically significantly favoured intervention
						Discharged to nursing home; mortality	No statistically significant effect with intervention
<b>Types of rehabilitation</b>							
<b>Enhanced rehabilitation for dementia</b>							
Smith et al. (2015) (137)	Cochrane review	316; 5 trials	Adults with dementia following hip fracture surgery	Enhanced rehabilitation strategies designed specifically for people with dementia	Usual care	Lower rates of some complications; chance of being in institutional care at 3 months post-discharge	Statistically significantly favoured intervention
						Functional outcomes; chance of being in institutional care at 12 months post-discharge; delirium	No effect with intervention/uncertain effect with intervention
<b>Physical and geriatric rehabilitation</b>							
Lahtinen et al. (2015) (138)	RCT	538	Patients with hip fracture	Physical rehabilitation Geriatric rehabilitation	Health centre hospital rehabilitation	4 and 12 month mortality	Statistically significantly favoured physical rehabilitation
						Independent living at 4 months	Statistically significantly favoured physical and geriatric rehabilitation
						Walking ability; assisted daily living; 12 month outcomes (unclear from abstract exactly which outcomes)	No statistically significant effect with interventions
<b>Home and community rehabilitation</b>							
Berggren et al. (2019) (139)	RCT	205	Adults aged 70 or over with hip fractures	Geriatric interdisciplinary home rehabilitation	Conventional geriatric care	Complications at 12 months; re-admission to hospital within 12 months; time spent in hospital	No statistically significant effect with intervention

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
Crotty et al. (2019) (140)	RCT	240	People aged 70 years or older living in a nursing home after hip fracture	4-week postoperative rehabilitation program delivered in Nursing Care Facilities	Usual care	4-week mobility; mortality at 4 weeks; 12-month quality of life	Statistically significantly improved with intervention
						Cost effectiveness (Australian)	Not found to be cost-effective
Karlsson et al (2016) (141)	RCT	205	People aged 70 or over operated on for hip fracture	Geriatric Interdisciplinary Home Rehabilitation	Conventional geriatric care and rehabilitation	Walking ability; use of walking device; gait speed	No statistically significant effect with intervention
						Median postoperative length of stay in the geriatric ward	Statistically significantly improved with intervention
<p>n = number of participants. RCT = randomised controlled trial. DVT = deep vein thrombosis.</p> <p>* Note the Cochrane review also included 1 trial in elective cancer surgery.</p>							

## 1.9 Patient and carer information

1.9.1 Offer patients (or, as appropriate, their carer and/or family) verbal and printed information about treatment and care including:

- diagnosis
- choice of anaesthesia
- choice of analgesia and other medications
- surgical procedures
- possible complications
- postoperative care
- rehabilitation programme
- long-term outcomes
- healthcare professionals involved. [2011]

### Surveillance proposal

No new information was identified at any surveillance review.

### Editorial amendments

There were no editorial amendments.

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### Patient and carer information

#### 2013 surveillance summary

No relevant evidence was identified.

#### 2015 surveillance summary

No relevant evidence was identified.

#### 2019 surveillance summary

No relevant evidence was identified.

### Intelligence gathering

There was no new intelligence from the 2019 surveillance process of relevance to this section of the guideline.

### Impact statement

There was no new evidence or intelligence found. The guideline recommendations will not be updated. This section of the guideline will be revisited at the next surveillance timepoint.

There was no new evidence.

## Areas not currently covered in the guideline

In previous and current surveillance, evidence was identified for areas not covered by the guideline. This new evidence has been considered for possible addition as a new section of the guideline.

### Corticosteroids before surgery

#### Surveillance proposal

This section should not be added.

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### Corticosteroids before surgery

#### 2015 surveillance summary

An RCT (142) of 82 patients found that administering single-dose methylprednisolone (125 mg intravenous) prior to intertrochanteric femoral fracture surgery statistically significantly reduced pain at rest, pain during 45 degree flexion of the hip, pain during walking after the surgery, and fatigue, compared with placebo. Nausea, vomiting and opioid consumption were not statistically significantly different.

#### 2019 surveillance summary

An RCT (143) of 117 older hip fracture patients found that administering single-dose methylprednisolone (125 mg intravenous) prior to hip fracture surgery statistically significantly reduced cumulative postoperative fatigue scores and prevalence of postoperative delirium. There were no statistically significant

differences in severity of delirium, 30- and 90-day mortality, rate of completing physiotherapy, postoperative pain, the administration of antipsychotic drugs, infection, or length of inpatient stay.

#### Intelligence gathering

No topic expert feedback was relevant to this section.

#### Impact statement

The evidence from 2 RCTs identified in the 2015 surveillance process did not find a consistent effect of methylprednisolone on delirium or pain. Topic experts did not raise this as a potential update area for the guideline. As such, this new evidence is not deemed sufficient to change current guideline recommendations and further robust evidence is required. This area will be revisited at subsequent surveillance review time points.

New evidence is unlikely to impact on the guideline.

## Preoperative traction for hip fracture

### Surveillance proposal

This section should not be added.

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### Preoperative traction for hip fracture

#### 2013 and 2015 surveillance summary

A meta-analysis and an RCT concluded that preoperative traction did not reduce pain in hip fracture nor did it improve surgical outcomes. (3) (144)

#### 2019 surveillance summary

No relevant evidence was identified.

#### Intelligence gathering

No topic expert feedback was relevant to this section.

#### Impact statement

The guideline currently does not recommend traction for pain management and this evidence is unlikely to affect the guideline.

New evidence is unlikely to impact on the guideline.

## Single fluoroscope or 2 fluoroscopes

### Surveillance proposal

This section should not be added.

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### Single fluoroscope or 2 fluoroscopes

#### 2015 surveillance summary

An RCT found that using 2 fluoroscopes instead of 1 during closed reduction and internal fixation for stable intertrochanteric fracture reduced total radiation time and total operating time (24.3 vs 34.7 minutes). (145)

#### 2019 surveillance summary

No relevant evidence was identified.

#### Intelligence gathering

No topic expert feedback was relevant to this section.

#### Impact statement

The guideline does not make recommendations on fluoroscopy

technique, and although 2 fluoroscopes seem to have benefits, the evidence is from a single small trial and further evidence is needed.

New evidence is unlikely to impact on the guideline.

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## Direct medical costs of hip fracture surgery

### Surveillance proposal

This section should not be added.

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## Direct medical costs of hip fracture surgery

### 2015 surveillance summary

An economic analysis indicated that the median cost per patient episode of hip fracture was £9,429 for people admitted from care homes in the UK in 2006. Of this, £7,129 (76%) was accounted for by hospital bed day costs, suggesting that interventions targeted at reducing hospital stay may be cost-effective.(146)

### 2019 surveillance summary

No relevant evidence was identified.

## Intelligence gathering

No topic expert feedback was relevant to this section.

## Impact statement

No interventions were specifically examined therefore although this information may be of use in future health economic evaluations undertaken during a guidance update, the evidence in isolation is unlikely to affect current recommendations. This study will be highlighted to the team developing the guideline during the proposed update of recommendation 1.6.4.

New evidence is unlikely to impact on the guideline.

# The effect of hip fracture on health related quality of life

## Surveillance proposal

This section should not be added.

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## The effect of hip fracture on health related quality of life

### 2015 surveillance summary

A prospective cohort study (147) examined 1-year patient-reported outcomes of 403 patients treated at a single major trauma centre in the United Kingdom who sustained a hip fracture between 2012 and 2014. Although quality of life (measured by EuroQol 5 Dimensions [EQ-5D]) improved during the year after the fracture, it was still statistically significantly lower than before injury irrespective of age group or cognitive impairment. Mean reduction in EQ-5D was statistically significantly greater in patients <80 years of age.

### 2019 surveillance summary

No relevant evidence was identified.

### Intelligence gathering

No topic expert feedback from the 2019 surveillance process was relevant to this section. In the 2015 surveillance process, topic experts considered that the cohort study presenting EQ-5D data may have implications for the health economic modelling in NICE CG124. NICE's health economist suggested that the principal

difference in this paper appears to be that the average hip fracture patient has a lower quality of life than previously assumed. The experts agreed that the economic analyses in the original guideline were robust and comprehensively modelled. The topic experts also noted the [WHiTE Study](#), an ongoing study evaluating the quality of life of around 8000 patients, which may add further information.

### Impact statement

The new evidence may have implications for health economic modelling within NICE CG124, but the results of the [World Hip Trauma Evaluation](#), which is intended to publish 2022, were deemed more value to include before revisiting the health economic modelling in the guideline. As such no impact on the guideline is expected. However, the publications related to the [WHiTE Study Group](#) are being tracked and will be considered as soon as possible once published. This study will also be highlighted to the team developing the guideline during the proposed update of recommendation 1.6.4.

New evidence is unlikely to impact on the guideline.

# Blood transfusion, cryocompression therapy and haemodynamic monitoring

## Surveillance proposal

This section should not be added.

## Blood transfusion, cryocompression therapy and haemodynamic monitoring

### 2019 surveillance summary

#### Blood transfusion

We identified 2 Cochrane reviews, and 3 RCTs that found no clear benefits of liberal red blood cell transfusion strategies, cryocompression therapy or invasive haemodynamic monitoring. See Table 7 below.

#### Intelligence gathering

No topic expert feedback was relevant to this section.

### Impact statement

There were no clear benefits of liberal red blood cell transfusion strategies, cryocompression therapy or invasive haemodynamic monitoring. These are not currently covered in the guideline and topic experts did not raise these as new areas for consideration for guideline update. NICE also currently has a guideline on [blood transfusion](#), that covers red blood cell transfusion across a range of patients. As such, this new evidence is unlikely to warrant an update.

New evidence is unlikely to impact on the guideline.

**Table 7 Blood transfusion, cryocompression therapy, or invasive haemodynamic monitoring**

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
<b>Red blood cell transfusion thresholds</b>							
Brunskill et al. (2015) (148)	Cochrane review	2,722; 6 trials	Adults undergoing hip fracture surgery	Red blood cell transfusion – liberal threshold based on a 10 g/dL haemoglobin trigger	Red blood cell transfusion – restricted threshold based on symptoms of anaemia or when the haemoglobin concentration <8 g/dL	Mortality; functional recovery; postoperative morbidity	No statistically significant effect of intervention

Authors (Year)	Type	n	Population	Intervention	Comparator	Outcome	Result
Gregson et al. (2015) (149)	RCT	284	Post-surgical hip fracture patients aged 65 or over with Hb levels <11.3g/dL	Restricted red blood cell transfusion (Hb<9.7 g/dL; < 6 mmol/L)	Liberal red blood cell transfusion (Hb < 11.3 g/dL; < 7 mmol/L)	Repeated measures of daily living activities; 90-day mortality rate	No statistically significant effect of intervention
						30-day mortality rate per-protocol analysis; 90-day mortality rate in nursing home residents	Statistically significantly favoured control
<b>Cryocompression therapy</b>							
Leegwater et al. (2017) (150)	RCT	125	Patients with intra or extracapsular hip fracture scheduled for hip fracture surgery	Postoperative continuous-flow cryocompression therapy	Postoperative usual care	Transfusion incidence; postoperative analgesic use; delirium; length of stay; timed up and go test; pain at 24 and 48 hours	No statistically significant effect of intervention
						Pain at 72 hours	Statistically significantly favoured intervention
<b>Invasive haemodynamic monitoring</b>							
Lewis et al. (2016) (151)	Cochrane review	403; 5 trials	Adults undergoing hip fracture surgery	Advanced invasive haemodynamic monitoring	Usual care or protocol using standard measures	Death; complications; able to return to normal accommodation after discharge	No statistically significant effect of intervention

## Research recommendations

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

### Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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

### Summary of findings

A Cochrane review found no difference in regional and general anaesthesia in terms of a range of outcomes, including postoperative morbidity, but the evidence was unlikely to impact recommendations, see 1.4 Anaesthesia above. The review concluded that further research is needed and as such does not currently fully address the research recommendation. This research recommendation will be revisited at the next surveillance review to see if more evidence is available which fully addresses the recommendation.

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For people with undisplaced (or non-displaced) intracapsular hip fracture, what features should be used to characterise the injury and what are the optimal clinical and cost-effective management strategies?

### Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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

## Summary of findings

Three RCTs identified in the 2019 surveillance process found that various forms of more intensive physiotherapy had some improvements in shorter term outcomes, such as functional assessment and length of hospital stay, but the evidence was unlikely to impact recommendations, see 1.7 Mobilisation strategies above. This new evidence does not fully address the research recommendation. As such, this research recommendation will be revisited at the next surveillance review to see if more evidence is available.

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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?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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What is the clinical and cost effectiveness of surgery within 36 hours of admission compared to surgery later than 36 hours from admission in mortality, morbidity and quality of life in patients with hip fracture?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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What is the clinical and cost effectiveness of preoperative and postoperative nerve blocks in reducing pain and achieving mobilisation and physiotherapy goals sooner in patients with hip fracture?

## Summary of findings

The evidence from 1 Cochrane review and 15 RCTs identified across the 2015 and 2019 surveillance reviews found a trend that favoured nerve blocks for controlling pain, compared with no nerve blocks or conventional analgesia. This evidence is broadly in line with the guideline recommendation 1.3.6 which suggests adding nerve blocks if paracetamol and opioids do not provide sufficient pain relief. See 1.3 Analgesia above. This new evidence does

not fully address the research recommendation. As such, this research recommendation will be revisited at the next surveillance review to see if more evidence is available.

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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?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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What is the clinical and cost effectiveness of intramedullary versus extramedullary fixation on mortality, functional status and quality of life in patients with reverse oblique trochanteric hip fracture?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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What is the clinical and cost effectiveness of a designated hip fracture unit within the trauma ward compared to units integrated into acute trusts on mortality, quality of life and functional status in patients with hip fracture?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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Do patients admitted to hospital with a fractured hip who live permanently in a care/nursing home have equal access to multidisciplinary rehabilitation as patients admitted from home?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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What quality of life value do individual patients and their carers place on different mobility, independence and residence states following rehabilitation?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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What is the patient's experience of being admitted to hospital with a hip fracture in relation to surgery, pain management, timeliness of information given, and rehabilitation?

## Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

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