Introduction
This Annual Evidence Update (AEU) on hip fracture has been released by NHS Evidence - emergency and urgent care in conjunction with NHS Evidence - trauma and orthopaedics. The scope of the literature search covers fractures affecting the proximal femur. This AEU will appeal to all health professionals, reflecting the multidisciplinary approach required across both primary and secondary care. However, there may be clinicians who are involved in the management of polytrauma and high energy injuries that affect the hip joint who will find that our update is offset from their area of interest.

Acknowledgements
We would like to acknowledge and thank Professor Matthew Cooke, Clinical Lead for NHS Evidence – emergency and urgent care, Mr Andrew Roberts, the Clinical Lead of NHS Evidence – trauma and orthopaedics for producing the 2009 Annual Evidence Update on hip fracture. Mr Mike Smyth and Dr Joanne Fisher for their commentary and assistance in the preparation of the pre-hospital section. Mr Xavier Griffin for his commentary and assistance in the preparation of the emergency department section. Mr Nimalan Maruthainar for his commentary on the results for sections iii - vi. Finally, thanks go to Emma Bayliss, Information Specialist, Ann Brocklehurst, Project Co-ordinator for NHS Evidence – trauma and orthopaedics, Rachel Court, Information Specialist and Beth Hall, Information Specialist for NHS Evidence – emergency and urgent care for searching, initial sifting, appraising and displaying the evidence in the specialist collections.

2009 Annual Evidence Update on Hip Fracture - Commentary and Results - Pre-hospital Care

This section has been written by Mr Mike Smyth and Dr Joanne Fisher and prepared by NHS Evidence - emergency and urgent care.

Note: The scope of this Annual Evidence Update covers fractures affecting the proximal femur.

Background
Fractures of the femoral neck are one of the most common limb injuries encountered in the pre-hospital setting and occur mainly in older patients. Typically patients may present with shortening or external rotation of the leg and pain in the hip. Patients may suffer from hypothermia, dehydration, etc. especially if they have been lying immobile on the floor for some time.

Management is directed toward minimising time to surgical intervention by minimising on scene times, providing sufficient and adequate analgesia, ensuring pressure areas are protected, preventing further soft tissue injury by minimising movement and immobilising (Brown et al 2006). Consideration of hydration status and the need for urinary catheterisation may be appropriate in geographically isolated areas or where transport times may be prolonged (Gillespie et al 2003).

Annual evidence update 2009
Search results addressing management of proximal femur fractures in the prehospital environment:

• No meta-analyses identified
• No systematic reviews identified
• No randomised controlled trials identified
• No retrospective analyses identified
• No case studies/reports identified

There is one prospective observational study (Roberts et al 2009) comparing on scene times for doctor/paramedic and paramedic/paramedic HEMS crew configurations. Within this study the use of pre-hospital femoral nerve block (undertaken by doctors) for femoral fracture is reported with mean on scene times documented; no data concerning the clinical effectiveness of the femoral nerve blocks is provided.

Narrative review of the evidence
There is a paucity of evidence for the assessment and management of proximal femoral fractures in prehospital care and therefore the evidence is extrapolated from evidence directed to secondary care.
Roberts et al (2009) indicate that femoral nerve block may be implemented in the prehospital environment. Graham et al (2008) report that femoral nerve block may achieve a significantly lower pain score at 30 minutes than compared with intravenous morphine sulphate (p=0.045) in the Emergency Department; however their study may not have achieved statistical significance had the authors undertaken intention to treat analysis. There is weak evidence to suggest that non-physicians can safely and effectively perform femoral nerve blocks in hospital (Obideyi et al 2009, Randall et al 2009 – these two papers appear to be reports of the same research), however neither of the papers report any robust statistical method or significant result.

Areas of Uncertainty

- When managing patients with proximal femoral fracture, can pre-hospital clinicians identify those patients who would benefit from urinary catheterisation?
- When managing patients with proximal femoral fracture, can pre-hospital clinicians perform urinary catheterisation safely and effectively?
- When managing patients with proximal femoral fracture, which approach to pre-hospital pain management achieves the most effective analgesia; morphine sulphate, ketamine or femoral nerve block?
- When managing patients with proximal femoral fracture, can pre-hospital clinicians identify those patients who would benefit from Femoral Nerve Block?
- When managing patients with proximal femoral fracture, can pre-hospital clinicians perform Femoral Nerve Block safely and effectively?

References


Related Links

2006 JRCALC Limb Trauma Guideline  
2009 Annual Evidence Update on Hip Fracture - Commentary and Results - Emergency Department Care

This section has been written by Mr Xavier Griffin and prepared by NHS Evidence - emergency and urgent care.

Note: The scope of this Annual Evidence Update covers fractures affecting the proximal femur.

Context
Fracture of the proximal femur is the single greatest challenge facing the trauma and orthopaedic community. In 1990, a global incidence of 1.31 million was reported and was associated with 740,000 deaths (Johnell and Kanis 2004). Fractures of the proximal femur constitute a heavy socioeconomic burden worldwide. The cost of this clinical problem is estimated at 1.75 million disability adjusted life years lost, 1.4% of the total healthcare burden in established market economies (Johnell and Kanis 2004).

Patients pass through multiple healthcare environments during their treatment for this type of fracture. They also encounter a range of different healthcare professionals. This area of the annual evidence update specifically concerns the care of these patients in the emergency department (ED).

Background evidence

Guidelines
SIGN National Clinical Guideline 111 (2009)
Management of hip fracture in older people
NICE (in progress (due 2011))
The management of hip fracture in adults

Systematic reviews and meta-analyses
Cochrane Reviews
Nerve blocks (subcostal, lateral cutaneous, femoral, triple, psoas) for hip fractures (2002)
Perioperative fluid volume optimization following proximal femoral fracture (2004)
Pre-operative traction for fractures of the proximal femur in adults (2006)

Integrated care pathways
Controversy exists regarding the effectiveness of integrated care pathways (ICPs) in the management of patients with proximal femoral fractures (Parker 2004). Currently, there is no nationally agreed or recommended ICP.

Annual evidence update 2009
Level I evidence
Systematic reviews

- No new systematic reviews or meta-analyses were published.

Randomised controlled trials

- A pilot randomised clinical trial of 3-in-1 femoral nerve block and intravenous morphine as primary analgesia for patients presenting to the emergency department with fractured hip

Other evidence
The lateral X-ray of the hip in fracture: A necessary procedure?
Digital image enhancement improves diagnosis of nondisplaced proximal femur fractures.
Difference in time to x ray with similar time to treatment decision leads to differences in waiting times of patients with hip fracture in a crowded emergency department.
The role of MRI in the diagnosis of proximal femoral fractures in the elderly.
Does a traction-internal rotation radiograph help to better evaluate fractures of the proximal femur?
Ultrasound-guided hematoma block in fractured neck of femur.
Full-length radiographs of the femur in patients with a femoral neck fracture and co-existent malignancy - are they of benefit?

Integrated care pathway for hip fractures - a help or a hindrance?

Narrative review of the evidence

Investigation of suspected proximal femoral fracture
Several studies have investigated the value of plain radiographs in the diagnosis of proximal femoral fractures. Bidwai et al reported that in a series of 71 patients suspected of proximal femoral fractures a lateral view aided diagnosis in one case (Bidwai, Ahmed et al. 2008). The authors suggested that the lateral view was not helpful and a saving of £8430 could be made in their institution per year. Koval et al reported the accuracy of fracture classification amongst trainees with and without supplementary traction-internal rotation views (Koval, Oh et al. 2008). Fifty-seven (8.1%) of all classifications were revised after adding the supplementary view, of which 42 changes were from an incorrect to a correct classification. In half of these cases this would have led to a change in the choice of implant or operative procedure. However, this result depends heavily on local practice with regard to surgeons’ individual indications for fracture management.

Botser et al reported the use of digital image enhancement to improve the diagnosis of proximal femoral fractures with plain radiographs. The Retinex filter outperformed all other filters with sensitivity, specificity, positive and negative predictive factors of 75.4%, 66.7%, 95% and 24.6% respectively. The authors suggest using the filter in patients with a high clinical suspicion of a fracture but negative plain DICOM images prior to MR imaging (Botser, Herman et al. 2009). Finally, O’Flaherty et al reported a series of 133 patients who sustained a proximal femoral fracture and had a known malignant illness (O’Flaherty, Thompson et al. 2008). All patients underwent plain imaging of the entire femur to exclude distal metastases. None of the patients had demonstrable distal pathology and no patients had been admitted with distal fractures of the femur at the time of reporting. The authors suggest that routine imaging of the femur in patients with a co-existent history of malignant disease is of limited value.

Pain relief
Graham et al reported a randomised pilot study of the clinical effectiveness of a ‘3-in-1’ bupivicaine femoral nerve block compared with a single bolus 0.1mg/kg dose of IV morphine in the ED setting (Graham, Baird et al. 2008). 40 patients were recruited and 33 completed the protocol. Patients in both treatment arms reported significantly reduced visual-analogue pain scores. There was also a significant reduction in pain scores in patients in the nerve block group at 30mins compared with IV morphine. There were no immediate complications. The authors suggest that this preliminary data may provide a rationale to test the effectiveness of femoral nerve blocks in large scale RCTs.

McAuliffe and Harmon report a single case of an ultrasound guided haematoma block in a patient with a subcapital fracture of the femoral neck (Mc Auliffe and Harmon 2009). The patient reported decreased pain scores until the time of surgery, 12 hours later. This may be a technique that warrants further investigation.

Other studies
Smith et al carried out further audit of the effectiveness of ICPs. The authors report the initial impact of a locally introduced ICP on clinical outcomes in patients with proximal femoral fracture (Smith, Harris et al. 2008). Interestingly, these authors were able to ‘close the audit cycle’ and implement changes to the ICP after initial review. This may provoke other institutions to review their tools more critically.

References


Parker MJ. Care pathways for hip fractures: a useful tool or passing fashion? Age and Ageing 2004;33(2):93-4. [Link to full-text]


2009 Annual Evidence Update on hip fracture - Commentary on Results - iii, iv, v and vi

This Annual Evidence Update is prepared by Mr Nimalan Maruthainar, an Associate Editor for NHS Evidence - trauma and orthopaedics, and the Information Specialists of this specialist collection. The bibliography below presents the results of a search of the literature relating to hip fracture prevention and management published during the last three years. In this introductory commentary, we particularly remark upon those publications within the last year which have added to the body of evidence relating to the more common questions facing practitioners in the field. As will be noted many of these questions remain unanswered. The commentary is founded on the publication’s abstract or other summary.

The inclusion of a study in this update does not imply endorsement and the Specialist Collection does not accept responsibility for the content or quality of included studies.

Pre-operative considerations:
Timing of surgical intervention.
The British Orthopaedic Association, and some other professional organisations about the world, recommend that surgical intervention for the treatment of hip fracture be within 48 hours of admission. Shiga T et al in their meta analysis determined that delay beyond 48 hours was associated with a 41% increase in the odds ratio of 30 day mortality and a 32% increased odds of 1 year mortality.

Surgical options:
Conservative versus operative treatment for adult hip fractures.
Perhaps surprisingly, in their review for the Cochrane Database, Handoll HH and Parker MJ concluded that the available evidence does not suggest major differences in outcome between conservative and operative management programmes for extracapsular femoral fractures. However, operative treatment was found to be associated with a reduced length of hospital stay and improved rehabilitation.

Cemented versus uncemented hemiarthroplasty for femoral neck fracture.
Ahn J et al in a meta-analysis found few statistical differences between the techniques, though they did remark upon the variability of the outcome measures employed by studies.

Total hip replacement versus hemi-arthroplasty.
Gok SK et al undertook a meta-analysis of 3 randomised studies and concluded that the long term outcomes were more favourable in patients treated by total hip arthroplasty. This conclusion would need to be considered in the context of the study populations.
Sliding hip screw devices versus intramedullary fixation.
In a further review for the Cochrane Database, Parker MJ and Handoll HH reported that sliding hip screw devices seem superior for trochanteric fracture. They do, however, add a rider that further studies may be needed to determine if intramedullary devices are better for specific fracture configurations, or if particular implants are beneficial.

Prevention:
Activity modification.
In a meta-analysis of studies of the effect of walking, Martyn-St James M and Carroll S noted an association of walking with a higher bone mineral density at the hip, though they did note that the studies had employed diverse methodologies.
The practice of tai chi has been suggested to reduce fracture risk. Lee MS et al reviewed the evidence in relation to bone density and concluded that current evidence for an effect of tai chi on fracture prevention through increased bone density is not convincing.

Hip protectors.
In a quality of life year (QUALY) based review of the evidence relating to the use of hip protectors in the elderly in long term care environments, Brown A et al noted a possible maximal benefit through the use of hip protectors and bisphosphonate therapy.

Vitamin D.
A review for the Cochrane Database, Avenell A et al confirms a lower rate of fracture in elderly institutionalised patients with combined vitamin D and calcium supplementation. The effect of vitamin D is reported to be dose dependent, Bishoff-Ferrari HA et al.

Calcium.
Although the other evidence above suggest that the efficacy of vitamin D supplementation is best combined with calcium supplementation, Reid IR et al caution against reliance on calcium therapy in isolation. They report an apparent increased risk of hip fracture related to this.

Relative benefits of chemical agents in fracture prevention.
Though there are a number of drugs employed with the aim of reducing fracture risk, no clear data is available regarding their relative efficacy or side-effect profiles, MacLean C et al. A number of reviews have been published relating to specific treatments including bisphosphonates and parathyroid hormone analogues.

Rehabilitation:
Ward D et al undertook a review for the Cochrane Database to compare care homes, hospital settings and own home environments for the rehabilitation of the elderly. This study, which was not centred on patients post hip fracture, did not identify any uniformly advantageous setting for patients.

2009 Annual Evidence Update on hip fracture - Results - Guidelines relating to sections iii - vi
The NHS Evidence - trauma and orthopaedics team have identified relevant guidelines published during the last 3 years.

Please note that the inclusion of citations in this list does not imply endorsements. NHS Evidence - trauma and orthopaedics does not accept responsibility for the content or quality of the included or excluded studies.

The following 10 guidelines were identified:

- Management of hip fracture in older people. SIGN, June 2009. [Link to specialist collection]
- Pharmacologic treatment of low bone density or osteoporosis to prevent fractures: a clinical practice guideline from the American College of Physicians. Annals of Internal Medicine, September 2008. [Link to specialist collection]

• Limb trauma. University of Warwick, Joint Royal Colleges Ambulance Liaison Committee, March 2007. [Link to specialist collection]

• Primary total hip replacement: a guide to good practice. British Orthopaedic Association, August 2006. [Link to specialist collection]

• Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults. NICE, April 2009. [Link to specialist collection]

• Dabigatran etexilate for the prevention of venous thromboembolism after hip or knee replacement surgery in adults. NICE, September 2008. [Link to specialist collection]

• Venous thromboembolism (VTE) risk assessment. Department of Health, September 2008. [Link to specialist collection]

• Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery. NICE, April 2007. [Link to specialist collection]

• 2009 Annual Evidence Update on hip fracture - Results - iii. Pre-operative preparation

This is part of the Annual Evidence Update 2009 on hip fracture. This section of the Annual Evidence Update has been prepared by the Clinical Lead and Information Specialists of NHS Evidence - trauma and orthopaedics and is based on a search of the literature for papers published in the last 3 years. The scope of the literature search covers fractures affecting the proximal femur.

The section below lists systematic reviews and meta-analyses. The evidence has been deliberately restricted to systematic reviews, because they are generally recognised as constituting the highest quality evidence in order to inform clinical practice.

Please note that the inclusion of citations in this list does not imply endorsements. NHS Evidence - trauma and orthopaedics does not accept responsibility for the content or quality of the included or excluded studies.

Results:

Pre-operative preparation (4)


• 2009 Annual Evidence Update on hip fracture - Results - iv. Surgical options

This is part of the Annual Evidence Update 2009 on hip fracture. This section of the Annual Evidence Update has been prepared by the Clinical Lead and Information Specialists of NHS Evidence - trauma and orthopaedics and is based on a search of the literature for papers published in the last 3 years. The scope of the literature search covers fractures affecting the proximal femur.

The section below lists systematic reviews and meta-analyses. The evidence has been deliberately restricted to systematic reviews, because they are generally recognised as constituting the highest quality evidence in order to inform clinical practice.
Please note that the inclusion of citations in this list does not imply endorsements. NHS Evidence - trauma and orthopaedics does not accept responsibility for the content or quality of the included or excluded studies.

Results:

Surgical options (18)


Parker MJ, Gurusamy K. Arthroplasties (with and without bone cement) for proximal femoral fractures in adults. Cochrane database of systematic reviews (Online). 2006;3:CD001706. [link to specialist collection]


Parker MJ, Handoll HH. Intramedullary nails for extracapsular hip fractures in adults. Cochrane database of systematic reviews (Online). 2006;CD004961. [link to specialist collection]


2009 Annual Evidence Update on hip fracture - Results - v. Prevention & Risk Factors

This is part of the Annual Evidence Update 2009 on hip fracture. This section of the Annual Evidence Update has been prepared by the Clinical Lead and Information Specialists of NHS Evidence - trauma and orthopaedics and is based on a search of the literature for papers published in the last 3 years. The section below lists systematic reviews and meta-analyses. The evidence has been deliberately restricted to systematic reviews, because they are generally recognised as constituting the highest quality evidence in order to inform clinical practice.

Please note that the inclusion of citations in this list does not imply endorsements. NHS Evidence - trauma and orthopaedics does not accept responsibility for the content or quality of the included or excluded studies.

Results: These have been grouped in the categories listed below:

Prevention (3)

- Dietary (13)
- Drugs (1)
  - Bisphosphonates (15)
  - Parathyroid Hormone (PTH) (3)
  - Statins (3)
  - Strontium ranelate (2)
- Exercise (5)
- Genetics (2)
- Ultrasound (2)

Fracture - Risk factors

- Alcohol (1)
- Prescriptive Drugs (3)
- Diabetes (3)
- Neurological Diseases (1)
- Renal Disease (3)
- Secondary Prevention (1)

Prevention


Dietary

Avenell A, Handoll HH. Nutritional supplementation for hip fracture aftercare in older people. Cochrane database of systematic reviews (Online). 2006;4:CD001880. [link to specialist collection]


**Drugs**


- Bisphosphonates


Woodis CB. Once-yearly administered intravenous zoledronic acid for postmenopausal osteoporosis. The Annals of Pharmacotherapy. 2008;42(7):1085-89.  [link to specialist collection]


Parathyroid Hormone (PTH)


Statins


Strontium ranelate


Exercise
Karlsson MK, Nordqvist A, Karlsson V. Physical activity, muscle function, falls and fractures. Food &
nutrition research. 2008;52:10. [PubMed]
2008;19(2):139-46. [link to specialist collection]
Martyn-St James, M, Carroll S. Meta-analysis of walking for preservation of bone mineral density in
Moayyeri A. The association between physical activity and osteoporotic fractures: a review of the
specialist collection]

- Genetics
Tran BN, et al. Association between LRP5 polymorphism and bone mineral density: a Bayesian meta-
analysis. BMC medical genetics. 2008;9:55. [link to specialist collection]
Uitterlinden AG, et al. The association between common vitamin D receptor gene variations and

- Ultrasound
Nayak S, et al. Meta-analysis: accuracy of quantitative ultrasound for identifying patients with

Fracture - Risk factors

- Alcohol
Berg KM, et al. Association between alcohol consumption and both osteoporotic fracture and bone

- Prescriptive Drugs
Etminan M, et al. Inhaled corticosteroids and the risk of fractures in older adults: a systematic review
Kjaergaard AD, et al. Estrogen receptor alpha polymorphism and risk of cardiovascular disease,
cancer, and hip fracture: Cross-sectional, cohort, and case-control studies and a meta-analysis.
Lopez LM, et al. Steroidal contraceptives: effect on bone fractures in women. Cochrane Database of
Systematic Reviews. 2009:2. [link to specialist collection]

- Diabetes
Loke YK, Singh S, Furberg CD. Long-term use of thiazolidinediones and fractures in type 2 diabetes:
collection]

- **Neurological Diseases**
  

- **Renal Disease**
  
  
  

- **Secondary Prevention**
  

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**2009 Annual Evidence Update on hip fracture - Results - vi. Rehabilitation & Orthogeriatric Care**

This is part of the Annual Evidence Update 2009 on hip fracture. This section of the Annual Evidence Update has been prepared by the Clinical Lead and Information Specialists of NHS Evidence - trauma and orthopaedics and is based on a search of the literature for papers published in the last 3 years. The scope of the literature search covers fractures affecting the proximal femur. The section below lists systematic reviews and meta-analyses. The evidence has been deliberately restricted to systematic reviews, because they are generally recognised as constituting the highest quality evidence in order to inform clinical practice.

**Please note** that the inclusion of citations in this list does not imply endorsements. NHS Evidence - trauma and orthopaedics does not accept responsibility for the content or quality of the included or excluded studies.

**Results:**
These have been grouped in the categories listed below:

- **Rehabilitation** (5)
- **Ortho-geriatric care**
  - **Risks** (1)
  - **Fracture and Falls Prevention** (7)
    - **Hip Protectors** (4)
  - **Rehabilitation of the elderly** (2)


Orthogeriatric care

- Risks


- Fracture and Falls Prevention


Richy F, Dukas L, Schacht E. Differential effects of D-hormone analogs and native vitamin D on the risk of falls: a comparative meta-analysis. Calcified tissue international. 2008;82(2);102-07. [link to specialist collection]

- Hip Protectors


- Rehabilitation of the elderly


**2009 Annual Evidence Update on hip fracture - horizon scanning**

_NHS Evidence - trauma and orthopaedics_ have identified forthcoming guidelines, projects and reviews concerning hip fracture. These will establish the evidence which will be published on hip fracture in the future.

**National Institute for Health and Clinical Excellence (NICE)**
The management of hip fractures in adults (June 2011)

**Cochrane Library - Protocols**
Rehabilitation interventions for improving physical and psychosocial functioning after hip fracture in older people
Multidisciplinary rehabilitation for older people with hip fractures
Thiazide diuretics and the risk of hip fracture
Anticoagulants (extended duration) for prevention of venous thromboembolism following total hip or knee replacement or hip fracture repair

**HTA Projects**
Vitamin K to prevent fractures in older women (September 2009)
Dabigatran etexilate for the prevention of venous thromboembolism in patients undergoing elective hip and knee surgery (Winter 2009)
Pragmatic multi-centre randomised trial of surgical versus non-surgical treatment for proximal fracture of the humerus in adults (2013)

**2009 Annual Evidence Update on hip fracture - ongoing clinical trials**

_NHS Evidence - trauma and orthopaedics_ have identified ongoing clinical trials. Mr Andrew Roberts (Clinical Lead, NHS Evidence - trauma and orthopaedics) searched the _Current Controlled Trials_ database to identify trials relevant to hip fracture. The results have been broken down into bite-size topics as follows:

**Rehabilitation**
Body Weight Supported Treadmill Training Following Hip Fracture
Early Rehabilitation After Hip Fracture
Evaluation of home rehabilitation for hip fracture patients
The Outcome and Cost Analysis of Home-Care Physical Therapy for Postoperative Hip Fracture Patients

**Secondary Prevention**
A Study That Will Compare the Effect of Two Drugs on Patients With Low Bone Mass and a Recent Hip Fracture
MASTER Program: Preventing Falls and Disability in Older Adults After Hip Fracture
Reducing Injuries From Medication-Related Falls Using Computerized Alerts for High Risk Patients
Strategies to Treat Osteoporosis Following a Fragility Fracture
Strength Training After Hip Fracture Surgery
The Study of the Early Administration of Alendronate on Prevention of Bone Loss After Hip Fracture
Trial of Osteoporosis Intervention Strategies in Hip Fracture Patients

**Bisphosphonates**
A Study of MK0822 in Postmenopausal Women With Osteoporosis to Assess Fracture Risk Reduction
A Study to Evaluate the Safety-- Tolerability-- and Efficacy of Odanacatib (MK0822) in Postmenopausal Women Previously Treated With a Bisphosphonate
BMD Efficacy and Safety of Odanacatib in Postmenopausal Women
PTH & Ibandronate Combination Study (PICS)
The Effect of Liberal Vs. Restrictive Transfusion Strategies on Rehabilitation After Hip Fracture Surgery

HRT
A Menopause Interactive Decision Aid System

Dietary modification
A Randomised– Controlled Comparison of Vitamin D Strategies is Acute Hip Fracture Patients
Vitamin D Supplementation in Older Women
Vitamin D Supplementation in Younger Women

Exercise
Exercise and Testosterone Therapy in Elderly Men With Physical Frailty

Peri-operative management
A New Clinical Pathway for Patients With Fractured Neck of Femur
Closing The Post Fracture Care Gap In Manitoba
Comparing Different Routes and Doses of Phytonadione (Vitamin K) for Reversing Warfarin Treated Patients
With Hip Fracture Before Surgery
Evaluation of AVE5026 as Compared to Enoxaparin for the Prevention of Thromboembolism in Patients
Undergoing Hip Fracture Surgery
Evaluation of AVE5026 as Compared to Placebo for the Extended Prophylaxis of Venous Thromboembolism in Patients
Having Undergone Hip Fracture Surgery
Femoral nerve blockade in hip fracture patients
Incidence of Delirium in Hip Fracture Patients Randomized to Regular Hypnotics Vs Placebo
Nutritional Intervention in Hip Fracture Patients
Postoperative Analgesia With Local Infiltration After Hip Fracture
Post-Operative Haloperidol Versus Placebo for Prevention of Post-Operative Delirium After Acute Hip Surgery
Pregabalin in the Prevention of Postoperative Delirium and Pain
Randomised controlled trial to assess the difference of spinal anaesthesia versus general anaesthesia in hip
replacement surgery
Randomised Trial Comparing Iron Supplementation Versus Placebo in the Treatment of Anaemia After Hip
Fracture
Sedation and Delirium in Elderly Hip Fracture Patients
Stroke Volume Optimisation in Patients With Hip Fracture
The Effect of Taurine on Morbidity and Mortality in the Elderly Hip Fracture Patient

Operative intervention
A Prospective Randomised Multicenter Study Comparing the Sliding Hip Screw and the Intertan Nail in
Trochanteric and Subtrochanteric Femoral Fractures
Bipolar Versus Unipolar Hemiarthroplasty for Patients With a Hip Fracture
Cemented vs Non-Cemented Semiendoprosthesis in the Treatment of Proximal Femoral Fractures
Clinical Evaluation on HA Coated Dynamic Hip Screws for Trochanteric Femoral Fractures
Comparing Total Hip Arthroplasty and Hemi-Arthroplasty on Revision Surgery and Quality of Life in Adults
With Displaced Hip Fractures (The HEALTH Study)
Comparison of Treatment Outcomes in Hip Fractures Surgically Fixed With Either a Two or Four Hole Device
Evaluation of Surgical Fixation Using Alternative Implants for the Treatment of Hip Fractures
Hemiarthroplasty or Internal Fixation for Displaced Femoral Neck Fractures
Hemiarthroplasty or Internal Fixation for Displaced Femoral Neck Fractures - 5 Years Follow up
InterTAN IM Nail Versus Sliding Hip Screw in Geriatric Fractures
Prospective Randomized Study on Cemented Versus Non-Cemented Hemiarthroplasty in Elderly With Hip
Fractures
Randomised trial of hip fractures treated with two different types of hip replacements
Re-Evaluation of GAmma3 Inamedullary Nails in Hip Fracture (REGAIN)
Using Alternative Implants for the Surgical Treatment of Hip Fractures (The FAITH Study)

2009 Annual Evidence Update on hip fracture - Treatment uncertainties

The NHS Evidence - trauma and orthopaedics project team have identified treatment uncertainties for
hip fracture. This involved critically appraising the systematic reviews identified in the Annual
Evidence Update (AEU) regarding treatment options.
The following treatment uncertainties were identified:

- Pharmacologic treatment of low bone density or osteoporosis to prevent fractures
- Does statin use reduce the risk of hip fracture?
- Interventions for preventing delirium in hospitalised patients
- Arthroplasties (with or without bone cement) for proximal femoral fractures in adults
- Gamma nail or sliding hip screw for the treatment of intertrochanteric fracture
- Intramedullary nails for extracapsular hip fractures in adults
- Internal fixation versus arthroplasty for intracapsular proximal femoral fractures in adults
- Osteotomy, compression and other modifications of surgical techniques for internal fixation of extracapsular hip fractures
- Closed suction surgical wound drainage after hip fracture surgery
- Nutritional supplementation for hip fracture aftercare in older people
- Calcium supplementation for hip fracture
- Hip protectors decrease hip fracture risk in elderly nursing home residents
- How effective are mobilisation strategies after hip fracture in adults?
- Effect of steroidal contraceptives on bone fractures in women

Mr Mike Smyth and Dr Joanne Fisher have identified the following areas of uncertainty:

**Areas of Uncertainty:**

- When managing patients with proximal femoral fracture, can pre-hospital clinicians identify those patients who would benefit from urinary catheterisation?
- When managing patients with proximal femoral fracture, can pre-hospital clinicians perform urinary catheterisation safely and effectively?
- When managing patients with proximal femoral fracture, which approach to pre-hospital pain management achieves the most effective analgesia; morphine sulphate, ketamine or femoral nerve block?
- When managing patients with proximal femoral fracture, can pre-hospital clinicians identify those patients who would benefit from Femoral Nerve Block?
- When managing patients with proximal femoral fracture, can pre-hospital clinicians perform Femoral Nerve Block safely and effectively?

### 2009 Annual Evidence Update on Hip Fracture - Methodology for sections i and ii

The 2009 Annual Evidence Update on Hip Fracture sections i - ii were produced by 'NHS Evidence - emergency and urgent care'. The aim was to find as many articles as possible on pre-hospital and emergency department care of proximal femoral fracture published in the last year. The decision to search for all types of article was made by Matthew Cooke, the Clinical Lead for 'NHS Evidence – emergency and urgent care', because he was not aware of any high level evidence on pre-hospital and emergency department care of proximal femoral fracture published in the last year.

#### Databases and search strategies

**PubMed** (searched 11/06/09)

#1 ((hip OR femur OR femoral) AND fractur*) OR ("hip fractures"[Mesh])

#2 ((fractur*) AND (subcapital OR transcervical OR capsular OR intracapsular OR extracapsular OR basicervical OR intertrochanteric OR subtrochanteric))

#3 #1 OR #2

Limited to 1 year, human, English language.

=1004

**EMBASE via NHS Databases** (searched 11/06/09)
Identification Criteria

The results above were combined in a Procite database and 1132 duplicates were removed (the duplicates search in Procite was configured to compare only title and then the results were scanned for any inconsistencies before duplicates were deleted).

= 3454

The 3454 remaining results (titles and abstracts) were scanned by Rachel Court, the information specialist for 'NHS Evidence – emergency and urgent care' and any definitely irrelevant titles were removed.

= 167

The 167 remaining results (titles, abstracts (and full-text where necessary)) were finally scanned by the relevant section author(s) and relevant articles were identified, as listed in sections i and ii.

The inclusion of a study in this update does not imply endorsement and the Specialist Collection does not accept responsibility for the content or quality of included studies.

2009 Annual Evidence Update on hip fracture - methodology for sections iii - vi

The 2009 Annual Evidence Update on hip fracture sections iii - xi was produced by NHS Evidence - trauma and orthopaedics. Our aim was to identify all systematic reviews published on hip fracture in the last three years.

Total publications: 2564
RCTs: 174
Systematic Reviews after appraisal: 96

Search period
The final searches were conducted on the 1 June 2009.
Databases and search strategies

PubMed Clinical Queries

• #1 ((hip OR femur OR femoral) AND fractur*) OR (exp. Hip fracture [MeSH])
• #2 ((fractur*) AND (subcapital OR intertrochanteric OR subtrochanteric))
• #3 #1 OR #2

Limited to 3 years, human and English language.
= 148 records retrieved

PubMed SIGN Filter

• #1 Hip fractur* [MeSH Major Topic]
• #2 ((hip OR femur OR femoral) AND fractur*)
• #3 #1 OR #2
• #4 (fractur*) AND (subcapital OR intertrochanteric OR subtrochanteric)
• #5 #3 OR #4
• #6 #5 AND SIGN Filter

Limited to 3 years, human and English language.
=209 records retrieved

NHS Databases
(AMED, BNI, CINAHL, EMBASE, MEDLINE, PsychINFO)

• #1 ((hip OR femur OR femoral) AND fractur*) OR (exp. Hip fracture [MeSH])
• #2 ((fractur*) AND (subcapital OR intertrochanteric OR subtrochanteric))
• #3 #1 OR #2
• #4 review (pt)
• #5 “meta analysis” (pt)
• #6 systematic* and (review* OR overview*) (ti/ab)
• #7 meta-analy* OR meta analy* OR metaanaly* (ti/ab)
• #8 #4 OR #5 OR #6 OR #7
• #9 #3 AND #8

Limited to 2006 - current
200 records retrieved.

NHS Evidence - trauma and orthopaedics
138 records were retrieved with no limits set. The results were scanned for relevant documents from the last 3 years.

Cochrane Library
85 records were retrieved with no limits set. The results were scanned for relevant documents from the last 3 years.

Systematic review identification criteria

Our aim was to identify all systematic reviews published on hip fracture for the last three years. All citations from database searches were imported into Reference Manager and duplicates removed. The search results were then scanned by the information specialist. This involved scanning the titles, abstracts and full texts where available to identify potential systematic reviews.

To identify systematic reviews the definition used by Glossary of Cochrane Collaboration Terms was used:

“*A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are
included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies."

The final decision on whether to include a citation as being a valid systematic review was made by Dr Andrew Roberts, Clinical Lead for NHS Evidence - trauma and orthopaedics, Consultant Orthopaedic Surgeon, Robert Jones & Agnes Hunt Orthopaedic and District Hospital NHS Trust.

**Results:** These have been grouped in the categories listed below:

iii. **Pre-operative preparation** (4)
iv. **Surgical options** (18)
v. **Prevention and risk factors**

Prevention (3)

- Dietary (13)
- Drugs (1)
  - Bisphosphonates (15)
  - Parathyroid Hormone (PTH) (3)
  - Statins (3)
  - Strontium ranelate (2)
- Exercise (5)
- Genetics (2)
- Ultrasound (2)

Fracture - Risk factors

- Alcohol (1)
- Prescriptive Drugs (3)
- Diabetes (3)
- Neurological Diseases (1)
- Renal Disease (3)
- Secondary Prevention (1)

vi **Rehabilitation & Ortho-geriatric Care**

- Rehabilitation (5)
- Ortho-geriatric care
  - Risks (1)
  - Fracture and Falls Prevention (7)
    - Hip Protectors (4)
  - Rehabilitation of the elderly (2)