Introduction

NHS Evidence - trauma and orthopaedics in conjunction with the NHS Evidence - musculoskeletal have produced an Annual Evidence Update on Spinal Diseases. Included in this Evidence Update are guidelines and systematic reviews published within the last year covering low back pain, ankylosing spondylitis, disc herniation and spinal fractures. This topic should be of particular interest to all health professionals working in this field.

Acknowledgements
We would like to acknowledge and thank Mr Nimalan Maruthainar, Consultant Orthopaedic Surgeon, Mr Wasim Khan, Academic Clinical Fellow, Rotation of the Royal Free and Royal National Orthopaedic Hospitals and Dr Ray Armstrong, Lead Consultant Rheumatologist and the Clinical Lead for the trauma and orthopaedics, and musculoskeletal specialist collections for providing the commentary. Also, Dr Ray Armstrong for appraising the literature search which has enabled this Annual Evidence Updates to be produced.

2009 Annual Evidence Update on spinal diseases - Methodology

The 2009 Annual Evidence Update on spinal diseases was produced by NHS Evidence - trauma and orthopaedics in conjunction with NHS Evidence - musculoskeletal. Our aim was to identify systematic reviews published in the last year.

Systematic Reviews (after appraisal):

Search period:
The final searches were conducted on the 27th October 2009.

Search strategy

- #1 Lumba* AND Spondyl*
- #2 Facet AND Joint AND Osteoarth*
- #3 Spondyl*
- #4 Lumba* AND Disc AND Degenerati*
- #5 Low AND Back AND (Pain OR Ache)
- #6 Lumbago OR Sciatica
- #7 #5 OR #6
- #8 Ankylosi* AND Spondyl*
- #9 Bechterew* OR Marie Str*
- #10 #8 OR #9
- #11 Osteop* AND (Spin* OR Vertebra*) AND Fractur*
- #12 #1 OR #2 OR #3 OR #4 OR #7 OR #10 OR #11

Databases searched

PubMed Clinical Queries Filter

- Limited to 1 year, human and English language.
- 196 records retrieved

MEDLINE with SIGN Filter
Limited to 1 year, human and English language.
119 records retrieved

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

- #1 review (pt)
- #2 "meta analysis" (pt)
- #3 systematic* and (review* OR overview*) (ti/ab)
- #4 meta-analy* OR meta analy* OR metaanaly* (ti/ab)
- #5 #1 OR #2 OR #3 OR #4
- #6 #5 AND #12 (Search strategy above)

Limited to 2008 - current.
308 records retrieved.

NHS Evidence - trauma and orthopaedics
NHS Evidence - musculoskeletal
Cochrane Library

Systematic review identification criteria
Our aim was to identify all systematic reviews published on spinal diseases excluding neck for the last year. All citations from database searches were imported into Reference Manager and duplicates removed. The search results were then scanned. 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 Ray Armstrong FRCP, Clinical Lead for NHS Evidence - musculoskeletal, and Lead Consultant Rheumatologist, Southampton General Hospital.

2009 Annual Evidence Update on spinal diseases - Results

This Annual Evidence Update has been prepared by the Clinical Leads and Information Specialists for NHS Evidence - musculoskeletal and NHS Evidence - trauma and orthopaedics specialist collections and is based on a search of the literature for papers published in the last year.

There is a brief section on Guidance, then a list of the systematic reviews and meta-analyses. We have deliberately restricted this material to systematic reviews, partly because systematic reviews are generally recognised as constituting the highest quality evidence in order to inform clinical practice.

Resources searched:
PubMed (using SIGN MEDLINE systematic review filter)
NHS Healthcare Databases (AMED, BNI, CINAHL, EMBASE, PsycINFO and MEDLINE)
PubMed (using PubMed Clinical Queries systematic review filter)
Cochrane Library Database of Systematic Reviews
Database of Abstracts of Reviews of Effects
NHS Evidence - musculoskeletal & NHS Evidence - trauma and orthopaedic specialist collections

Methodology:
Following the search, abstracts were reviewed by the Clinical Leads and Information Specialists and those that were not deemed relevant were rejected. A total of 6 Guidelines and 58 systematic reviews and meta-analyses remained after this process and these are listed below and grouped into the following topics:
• Guidelines (6)
• Ankylosing spondylitis (3)
• Low back pain
  Risk (4)
  Prevention (2)
  Imaging (2)
  Infection (1)
  Failed surgery (5)
  Management
  General aspects (6)
  Spinal cord stimulation (2)
  TENS (1)
  Comp & Alt (2)
  Exercise (4)
  Education (1)
  Injections (6)
  Drugs (1)
  Physical therapy (3)
  Orthoses (1)
  Surgery (4)
  Rehabilitation (2)
  Sacroiliac joint (1)
• Disc herniation (7)
• Spinal fractures (2)

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

Reference List

Guidelines
Prosthetic intervertebral disc replacement in the lumbar spine. NICE. 22 Jul 2009. [Link to specialist collection]
Percutaneous endoscopic laser cervical discectomy. NICE. 24 June 2009. [Link to specialist collection]
Percutaneous endoscopic laser lumbar discectomy. NICE. 27 May 2009. [Link to specialist collection]
Metastatic spinal cord compression: diagnosis and management of adults at risk of and with metastatic spinal cord compression. NICE. 26 Nov 2008. [Link to specialist collection]

Recently added guidelines to the specialist collections published after the literature search date:
Lateral (including extreme, extra and direct lateral) interbody fusion in the lumbar spine. NICE, November 2009. [Link to specialist collection]
Percutaneous intradiscal electrothermal therapy for low back pain. NICE, November 2009. [Link to specialist collection]
Back pain - low (without radiculopathy) Clinical Knowledge Summaries, December 2009. [Link to specialist collection]
Back pain - low (without radiculopathy): Acute non-specific low back pain (up to 6 weeks) Clinical Knowledge Summaries, December 2009. [Link to specialist collection]
Back pain - low (without radiculopathy): Chronic non-specific low back pain (more than 6 weeks) Clinical Knowledge Summaries, December 2009. [Link to specialist collection]
Sciatica (lumbar radiculopathy) Clinical Knowledge Summaries, December 2009. [Link to specialist collection]

Ankylosing spondylitis


**Low back pain**

**Risk**


Christensen ST, Hartvigsen J. Spinal curves and health: a systematic critical review of the epidemiological literature dealing with associations between sagittal spinal curves and health. *J Manipulative Physiol Ther* 2008; 31(9):690-714.  [Link to specialist collection]


**Prevention**


**Imaging**


**Infection**


**Failed surgery**


Management

General aspects


Spinal cord stimulation


Transcutaneous electrical nerve stimulation (TENS)


Complementary & Alternative therapies


Exercise


Education


Injections

Drugs  
Physical Therapy  
Orthoses  
Surgery  
Rehabilitation  
Sacroiliac joint  
Disc herniation

Spinal fractures

2009 Annual Evidence Update on spinal diseases - Ankylosing spondylitis - Results

This Annual Evidence Update has been prepared by the Clinical Leads and Information Specialists for NHS Evidence - musculoskeletal and NHS Evidence - trauma and orthopaedics specialist collections and is based on a search of the literature for papers published in the last year. There is a brief section on Guidance, then a list of the systematic reviews and meta-analyses. We have deliberately restricted this material to systematic reviews, partly because systematic reviews are generally recognised as constituting the highest quality evidence in order to inform clinical practice.

Resources searched:
PubMed (using SIGN MEDLINE systematic review filter)
NHS Healthcare Databases (AMED, BNI, CINAHL, EMBASE, PsycINFO and MEDLINE)
PubMed (using PubMed Clinical Queries systematic review filter)
Cochrane Library Database of Systematic Reviews
Database of Abstracts of Reviews of Effects
NHS Evidence - musculoskeletal & NHS Evidence - trauma and orthopaedic specialist collections

Methodology:
Following the search, abstracts were reviewed by the Clinical Leads and Information Specialists and those that were not deemed relevant were rejected. A total of 6 Guidelines and 58 systematic reviews and meta-analyses remained after this process and these are listed on the 'Results' page with either links to citations in the specialist collections or PubMed.

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Reference List


2009 Annual Evidence Update on spinal diseases - Disc herniation - Results

This Annual Evidence Update has been prepared by the Clinical Leads and Information Specialists for NHS Evidence - musculoskeletal and NHS Evidence - trauma and orthopaedics specialist collections and is based on a search of the literature for papers published in the last year.

There is a brief section on Guidance, then a list of the systematic reviews and meta-analyses. We have deliberately restricted this material to systematic reviews, partly because systematic reviews are generally recognised as constituting the highest quality evidence in order to inform clinical practice.

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PubMed (using SIGN MEDLINE systematic review filter)
NHS Healthcare Databases (AMED, BNI, CINAHL, EMBASE, PsycINFO and MEDLINE)
PubMed (using PubMed Clinical Queries systematic review filter)
Cochrane Library Database of Systematic Reviews
Database of Abstracts of Reviews of Effects
NHS Evidence - musculoskeletal & NHS Evidence - trauma and orthopaedic specialist collections

Methodology:
Following the search, abstracts were reviewed by the Clinical Leads and Information Specialists and those that were not deemed relevant were rejected. A total of 6 Guidelines and 58 systematic reviews and meta-analyses remained after this process and these are listed on the 'Results' page with either links to citations in the specialist collections or PubMed.

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Reference List


2009 Annual Evidence Update on spinal diseases - Low back pain - Results

This Annual Evidence Update has been prepared by the Clinical Leads and Information Specialists for NHS Evidence - musculoskeletal and NHS Evidence - trauma and orthopaedics specialist collections and is based on a search of the literature for papers published in the last year. There is a brief section on Guidance, then a list of the systematic reviews and meta-analyses. We have deliberately restricted this material to systematic reviews, partly because systematic reviews are generally recognised as constituting the highest quality evidence in order to inform clinical practice.

Resources searched:
PubMed (using SIGN MEDLINE systematic review filter)
NHS Healthcare Databases (AMED, BNI, CINAHL, EMBASE, PsycINFO and MEDLINE)
PubMed (using PubMed Clinical Queries systematic review filter)
Cochrane Library Database of Systematic Reviews
Database of Abstracts of Reviews of Effects
NHS Evidence - musculoskeletal & NHS Evidence - trauma and orthopaedic specialist collections

Methodology:
Following the search, abstracts were reviewed by the Clinical Leads and Information Specialists and those that were not deemed relevant were rejected. A total of 6 Guidelines and 58 systematic reviews and meta-analyses remained after this process and these are listed on the 'Results' page with either links to citations in the specialist collections or PubMed.

Results for Low back pain (LBP):
These have been grouped in the categories listed below:
Risk (4)
Prevention (2)
Imaging (2)
Infection (1)
Failed surgery (5)
Management

- General aspects (6)
- Spinal cord stimulation (2)
- Transcutaneous electrical nerve stimulation (TENS) (1)
- Complementary and Alternative Therapies (2)
- Exercise (4)
- Education (1)
- Injections (6)
- Drugs (1)
- Physical therapy (3)
- Orthoses (1)
- Surgery (4)
- Rehabilitation (2)
- Sacroiliac joint (1)

Please note that the inclusion of citations in this list does not imply endorsement as each individual citation has not been appraised. The Trauma and Orthopaedics Specialist Library does not accept responsibility for the content or quality of included studies.

For further information on complementary and alternative therapies, please see the Annual Evidence Update on complementary and alternative medicine for low back pain published on 16 November 2009 by NHS Evidence - complementary and alternative medicine.

Reference List

Low back pain
Risk


Christensen ST, Hartvigsen J. Spinal curves and health: a systematic critical review of the epidemiological literature dealing with associations between sagittal spinal curves and health. *J Manipulative Physiol Ther* 2008; 31(9):690-714. [Link to specialist collection]


Prevention


Imaging


Infection


Failed surgery


Management

General aspects


**Spinal cord stimulation**


**Transcutaneous electrical nerve stimulation (TENS)**


**Complementary and Alternative Therapies**


**Exercise**


**Education**


**Injections**


**Drugs**  

**Physical therapy**  


**Orthoses**  

**Surgery**  


**Rehabilitation**  


**Sacroiliac joint**  

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**2009 Annual Evidence Update on spinal diseases - Spinal fractures - Results**  
This Annual Evidence Update has been prepared by the Clinical Leads and Information Specialists for [NHS Evidence - musculoskeletal](https://nhs.evidence-musculoskeletal) and [NHS Evidence - trauma and orthopaedics](https://nhs.evidence-trauma-and-orthopaedics) specialist collections and is based on a search of the literature for papers published in the last year.  
There is a brief section on Guidance, then a list of the systematic reviews and meta-analyses. We have deliberately restricted this material to systematic reviews, partly because systematic reviews are generally recognised as constituting the highest quality evidence in order to inform clinical practice.
Resources searched:
PubMed (using SIGN MEDLINE systematic review filter)
NHS Healthcare Databases (AMED, BNI, CINAHL, EMBASE, PsycINFO and MEDLINE)
PubMed (using PubMed Clinical Queries systematic review filter)
Cochrane Library Database of Systematic Reviews
Database of Abstracts of Reviews of Effects
NHS Evidence - musculoskeletal & NHS Evidence - trauma and orthopaedic specialist collections

Methodology:
Following the search, abstracts were reviewed by the Clinical Leads and Information Specialists and
those that were not deemed relevant were rejected. A total of 6 Guidelines and 58 systematic
reviews and meta-analyses remained after this process and these are listed on the 'Results'
page with either links to citations in the specialist collections or PubMed.

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

Reference list
Giele BM, Wiertsema SH, Beelen A, van der Schaaf M, Lucas C, Been HD et al. No evidence for the
[Link to specialist collection]
Westerveld LA, Verlaan JJ, Oner FC. Spinal fractures in patients with ankylosing spinal disorders: a
systematic review of the literature on treatment, neurological status and complications. Eur Spine J
2009;18(2):145-156. [Link to specialist collection]

2009 Annual Evidence Update on spinal diseases - Commentary

This commentary is prepared by Mr Nimalan Maruthainar, Deputy Clinical Lead for NHS Evidence -
trauma and orthopaedics, Dr Ray Armstrong, Clinical Lead for NHS Evidence - musculoskeletal and
NHS Evidence - trauma and orthopaedics, Mr Wasim Khan, Academic Clinical Fellow, Rotation of the
Royal Free and Royal National Orthopaedic Hospitals and the Information Specialist following a
literature search. In this commentary based upon the results of the literature search, we particularly
remark upon those publications which have added to the body of evidence relating to the more
common questions facing practitioners in the field. As will be noted some of these questions remain
unanswered.
The commentary is founded on the systematic review’s abstract or other summary, and the inclusion
of a study in this update does not imply endorsement. The Specialist Collections do not accept
responsibility for the content or quality of included studies.

Disc Herniation
A search of the literature has revealed 7 new systematic reviews published in the past year in the
area of disc herniation.
In their review of thermal annular procedures, Helm et al conclude that intra-discal electrotherapy
(IDET) “offers functionally significant relief in approximately one-half of appropriately chosen chronic
discogenic low back pain patients.” To the reader the question arises of whether it is possible to
predict which patients may respond to treatment by this modality.
Watters and McGirt reviewed conservative versus aggressive discectomy for the treatment of disc
herniation with radiculopathy found no strong studies to support conservative against aggressive
surgery and recommended that further randomised studies of this area are needed.

Low Back Pain
Search of the literature revealed 46 systematic reviews published in the past year, on the subject of
low back pain. This section describes the results of a selection of these publications.
In the area of prevention, a review of controlled trials to evaluate the effectiveness of interventions to
prevent back pain episodes by Bigos et al found that only exercise interventions were effective. The
other interventions studied (and found ineffective) included stress management, shoe inserts, back supports, ergonomic/back education, and reduced lifting programs. The effect of insoles in low back pain was also studied by Sahar et al.4 in their review within the framework of the Cochrane Collaboration Back Review Group. They conclude that there is “strong evidence that insoles are not effective for the prevention of back pain. The current evidence on insoles as treatment for low back pain does not allow any conclusions.” Reviews by Bala MM et al.5 and Frey ME et al.6 on the use of spinal cord stimulation in failed back surgery syndrome conclude that the intervention is effective in reducing the pain. The results of a review by Yuan J et al.7 on the literature surrounding acupuncture yielded possibly conflicting results. The investigators report “moderate evidence that acupuncture is more effective than no treatment, and strong evidence of no significant difference between acupuncture and sham acupuncture, for short-term pain relief. There is strong evidence that acupuncture can be a useful supplement to other forms of conventional therapy for nonspecific LBP”. Reviews of publications studying injection modalities for the treatment of low back pain, include an updated Cochrane Review. Staal et al.8 found insufficient evidence to support the use of injection therapy in subacute and chronic low back pain.

**Spinal Fractures**

Search of the literature showed only 2 recent good quality reviews in the area of spinal fractures:

**Spinal fractures in patients with ankylosed spines**

The ankylosed spine could be due to advanced diffuse idiopathic skeletal hyperostosis (DISH) or ankylosing spondylitis (AS) and is prone to fracture after minor trauma due to altered biomechanical properties. Westerveld et al.9 conducted a systematic review of the literature looking at the treatment, neurological status and complications of patients with pre-existing ankylosed spines sustaining spinal trauma. A literature search was performed to obtain 93 relevant articles concerning the outcome of 345 AS patients and 55 DISH patients admitted with spinal fractures. They found that most fractures were located in the cervical spine and resulted from low energy impact. Delayed diagnosis often occurred due to patient and doctor related factors. On admission 67.2% of the AS patients and 40.0% of the DISH patients had neurologic deficits, while secondary neurological deterioration occurred frequently. Surgical or non-operative treatment did not alter the neurological prospective for most patients. The complication rate was 51.1% in AS patients and 32.7% in DISH patients. The overall mortality 3 months after injury was 17.7% in AS and 20.0% in DISH.

This review suggests that the clinical outcome of patients with fractures in previously ankylosed spines, due to AS or DISH, is considerably worse compared to the general trauma population.

**The effectiveness of bracing in thoracolumbar fractures**

Although the use of braces in thoracolumbar fractures is widespread, the effectiveness of bracing is controversial. Giele et al.10 performed a systematic review on the use of braces in patients with traumatic thoracolumbar fractures based on outcome and length of hospital stay, and evaluation of complications of bracing. An electronic search strategy was used in various databases to identify studies that compared bracing and non-bracing therapies. Two reviewers independently selected systematic reviews (0), randomized controlled trials (0), controlled clinical trials (0), retrospective studies (7) and observational studies (1), and both assessed the methodological quality and extracted the data.

None of the studies they looked at showed an effect of bracing. The observational study looked at 48 patients with a thoracolumbar fracture who were non-operatively treated with a brace and two experienced skin problems that were not properly specified. They concluded that in the present literature, there is no evidence for the effectiveness of bracing in patients with traumatic thoracolumbar fractures. Because of poor methodological quality, no best-evidence synthesis could be performed. The lack of high-quality studies prevented relevant conclusions from being drawn.

**References**


2009 Annual Evidence Update on spinal diseases - Treatment uncertainties

NHS Evidence - trauma and orthopaedics and NHS Evidence - musculoskeletal have identified treatment uncertainties for spinal diseases. This involved critically appraising the systematic reviews identified in the 2009 Annual Evidence Update (AEU) regarding treatment options. The following treatment uncertainties were identified:

- Spinal endoscopic adhesiolysis for post lumbar surgery syndrome
- Posterior discectomy for lumbar disc herniations
- Injection therapy for subacute and chronic low back pain
- Massage for low back pain
- Tran cutaneous electrical nerve stimulation (TENS) for low back pain
- Transforaminal epidural steroid injections for low back pain
- Paracetamol for low back pain

Link to the Spinal Diseases module on UK Database of Uncertainties about the Effects of Treatments (DUETs). This module contains the uncertainties identified following the critical appraisal process for the 2009 Annual Evidence Update on spinal diseases along with other identified uncertainties. The module will be updated on a regular basis as more uncertainties are identified.

2009 Annual Evidence Update on spinal diseases - Horizon scanning

The NHS Evidence - trauma and orthopaedics in conjunction with NHS Evidence - musculoskeletal have identified forthcoming guidelines, projects and reviews concerning spinal diseases. These establish evidence on spinal diseases which will be published in the future.

National Institute for Health and Clinical excellence (NICE)
• Golimumab for the treatment of ankylosing spondylitis (February 2010)

HTA Projects (recent)

• Management strategies for sciatica
• A multi-centred randomised controlled trial of a primary-care based cognitive behavioural programme for low back pain (UK-Best)

Cochrane Library - protocols

• Spinal manipulative therapy for chronic low-back pain
• Workplace interventions for low-back pain in workers