



EVIDENCE-BASED MANAGEMENT OF ACUTE MUSCULOSKELETAL PAIN

Australian Acute Musculoskeletal Pain Guidelines Group



Australian Government
National Health and
Medical Research Council

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PARTICIPATION

The work is a joint initiative of the University of Queensland and the Commonwealth Department of Health and Ageing. The evidence review was undertaken by a multi-disciplinary group. The following organisations participated in the review and have approved the contents:

- Australian and New Zealand College of Anaesthetists, Faculty of Pain Medicine
- Australian Osteopathic Association
- Australian Rheumatology Association
- Australian Physiotherapy Association
- Chiropractic and Osteopathic College of Australasia
- Chiropractors' Association of Australia
- Consumers' Health Forum of Australia
- Royal Australian College of General Practitioners

DISCLAIMER

Every attempt has been made to locate the most recent scientific evidence. Judgment is necessary when applying evidence in a clinical setting. It is important to note that weak evidence does not necessarily mean that a practice is inadvisable, but may reflect the insufficiency of evidence or the limitations of scientific investigation.

This document is intended as a guide to practice. The ultimate decision of how to proceed rests with the clinician and the patient and depends on individual circumstances and beliefs (NHMRC 1999).

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Contents

		<i>List of Tables</i>	x
		<i>List of Figures</i>	xii
		<i>About the Group:</i> <i>Australian Acute Musculoskeletal Pain Guidelines Group</i>	xiii
Chapter	① →	<i>Executive Summary</i>	1
		Rationale	1
		Scope	1
		Summary of Findings	2
		Limitations of Findings	2
		<i>Summary of Key Messages</i>	2
		>References	16
Chapter	② →	<i>Acute Pain Management</i>	17
		Pain	17
		Acute Pain	17
		Pain Assessment	17
		Pain Management	20
		Pain Management Plan	20
		Interventions for Acute Musculoskeletal Pain	21
		>References	22
Chapter	③ →	<i>Effective Communication</i>	23
		Communication	23
		Medical Terminology	23
		Learning Methods	23
		Factors Affecting Communication	23
		Evidence Review	23
		Research Priorities	24
		>References	24
Chapter	④ →	<i>Acute Low Back Pain</i>	25
		Definition of Acute Low Back Pain	25
		Scope	25
		Guideline Development Process	26
		Research Agenda for Acute Low Back Pain	27
		<i>Summary of Key Messages</i>	28
		DIAGNOSIS	32
		>Aetiology and Prevalence	32
		Conditions Associated with Acute Low Back Pain: Radiological Findings	32
		>History	33
		Pain History	33
		Clinical Features of Specific Conditions	35
		▶ Alerting Features of Serious Conditions (see Table 4.6)	36
		>Physical Examination	36
		Physical Assessment	36
		Psychosocial Assessment	37
		Neurological Assessment	38



>Ancillary Investigations	38
Imaging	38
Other Investigations	39
>Terminology	39
Diagnostic Terms	39
PROGNOSIS	39
Natural History	39
Prognostic Risk Factors	40
INTERVENTIONS	42
Evidence of Benefit	42
Conflicting Evidence	43
Insufficient Evidence	46
>Economic Implications	54
>References	54
Chapter 5 → Acute Thoracic Spinal Pain	63
Definition of Acute Thoracic Spinal Pain	63
Scope	63
Guideline Development Process	63
Research Agenda for Acute Thoracic Spinal Pain	64
<i>Summary of Key Messages</i>	65
DIAGNOSIS	67
>Aetiology and Prevalence	67
Serious Conditions	67
Mechanical Conditions	69
Conditions Referring Pain to the Thoracic Spine	70
Conditions Referring Pain from the Thoracic Spine	71
Prevalence of Conditions Causing Acute Thoracic Spinal Pain	71
>History	71
Pain History	71
>Physical Examination	72
Inspection	72
Palpation	73
Movement	74
▶ Alerting Features of Serious Conditions (see Table 5.7)	74
>Ancillary Investigations	74
Plain Radiography	74
Computed Tomography (CT) Scanning	76
Magnetic Resonance Imaging (MRI)	76
Other Investigations	77
Cost Effectiveness of Investigations	77
>Terminology	77
Recommended Terms	77
PROGNOSIS	78
Natural History	78
Influence of Risk Factors and Diagnostic and Therapeutic Interventions	78
INTERVENTIONS	78
Evidence of Benefit	78
Other Treatment	78
>References	78

Chapter

6



<i>Acute Neck Pain</i>	83
Definition of Acute Neck Pain	83
Scope	83
Guideline Development Process	83
<i>Summary of Key Messages</i>	85
Research Agenda for Acute Neck Pain	90
DIAGNOSIS	90
>Aetiology and Prevalence	90
Rare Causes of Acute Neck Pain	90
Uncommon Causes of Acute Neck Pain	91
Common Causes of Acute Neck Pain	91
Other Issues	92
Aetiological Risk Factors (Idiopathic neck pain)	92
Aetiological Risk Factors (Whiplash-Associated Neck Pain)	94
>History	94
Pain History	94
▶ Alerting Features of Serious Conditions (see Table 6.5)	95
>Physical Examination	96
General Examination	96
Neurological Examination	96
Musculoskeletal Examination	97
>Ancillary Investigations	97
Plain Radiography	97
Canadian C-Spine Rule.....	98
Computed Tomography Scanning	100
Magnetic Resonance Imaging	100
Single Photon Emission Computed Tomography	101
Other Ancillary Investigations	101
>Terminology	101
Specific and Serious Causes of Acute Neck Pain	101
Terms to Describe Acute Neck Pain	101
PROGNOSIS	101
Natural History	101
Prognostic Risk Factors	102
INTERVENTIONS	103
Evidence of Benefit	103
Insufficient Evidence of Benefit	106
Evidence of No Benefit	110
>References	110

Chapter

7



<i>Acute Shoulder Pain</i>	119
Definition of Acute Shoulder Pain	119
Scope	119
Guideline Development Process	119
Research Agenda for Acute Shoulder Pain	121
<i>Summary of Key Messages</i>	121
DIAGNOSIS	124
>Aetiology and Prevalence	124
Painful Conditions of the Shoulder	124
Conditions Referring Pain to the Shoulder	127
Prevalence of Conditions Causing Acute Shoulder Pain	127
Aetiological Risk Factors	128

>History	129
Pain History	129
General History	130
Psychosocial History	130
Evidence of Reliability	130
Evidence of Validity	130
>Physical Examination	130
Inspection	130
Palpation	130
Movement Testing	131
Evidence of Reliability	132
Evidence of Validity	133
▶ Alerting Features of Serious Conditions (see Table 7.11)	134
>Ancillary Investigations	134
Medical Imaging	134
Indications for Medical Imaging	134
Plain Radiography	134
Ultrasonography	135
Magnetic Resonance Imaging	137
MR Arthrography	139
Radionuclide Bone Scanning (Scintigraphy)	139
Other Ancillary Investigations	140
Conclusion	140
>Terminology	140
PROGNOSIS	141
Natural History	141
Prognostic Risk Factors	142
INTERVENTIONS	142
Evidence of Benefit	142
Conflicting Evidence	145
Insufficient Evidence	145
>References	146
Chapter 8 → Anterior Knee Pain	155
Definition of Patellofemoral Pain	155
Scope	155
Guideline Development Process	155
<i>Summary of Key Messages</i>	157
Research Agenda for Anterior Knee Pain	160
DIAGNOSIS	160
>Aetiology and Prevalence	160
Aetiology of Patellofemoral Pain	160
Serious Conditions Causing Anterior Knee Pain	161
Other Specific Conditions Causing Anterior Knee Pain	161
Conditions Referring Pain to the Anterior Knee	163
Prevalence of Causes of Anterior Knee Pain	163
Aetiological Risk Factors for Patellofemoral Pain	163
>History	164
Pain History	164
▶ Alerting Features of Serious Conditions (see Table 8.3)	165
>Physical Examination	165
Inspection	165
Palpation	165

Chapter 8 →

		Assessment of Movement	166
		Reliability and Validity of Physical Tests	167
		Summary of Clinical Features of Patellofemoral Pain	167
		>Ancillary Investigations	167
		Medical Imaging	167
		Plain Radiography	167
		Computed Tomography (CT)	169
		Radionuclide Scan	169
		Magnetic Resonance Imaging (MRI)	169
		Ultrasound	169
		Arthrography	170
		Other Ancillary Investigations	170
		>Terminology	170
		Patellofemoral Pain	170
		PROGNOSIS	170
		Natural History	170
		INTERVENTIONS	170
		Evidence of Benefit	171
		Conflicting Evidence	172
		Insufficient Evidence	172
		Evidence of No Benefit	173
		>Economic Implications	173
		>References	174
Chapter	9	→ <i>Process Report</i>	183
		>Overview	183
		Multi-Disciplinary Involvement	183
		Target Audiences	183
		>Evidence Review Process	183
		Evaluation of Existing Guidelines	183
		Search for New Evidence	184
		Critical Appraisal Process	185
		Data Analysis and Key Messages	185
		Development of a Management Plan for Acute Musculoskeletal Pain	185
		>Economic Implications	187
		>Consultation Process	187
		>Health Consumers	187
		>Dissemination and Implementation	187
		Dissemination Strategies	187
		Implementation Strategies	187
		Revision Strategy	187
		>Legal Implications	188
		>References	188
Appendix	A	→ <i>Glossary of Terms</i>	189
Appendix	B	→ <i>Table of Unit Costs (November 2002)</i>	191
Appendix	C	→ <i>Ancillary Investigations</i>	195
Appendix	D	→ <i>Consultation</i>	197
Appendix	E	→ <i>Tables of Included and Excluded Studies</i>	199

List of Tables

4.1	Conditions Associated with the Presence of Acute Low Back Pain	33
4.2	Radiological Findings in Patients with Low Back Pain in Primary Care	33
4.3	Prevalence of Spondylosis in Asymptomatic Individuals and Patients with Lumbar Spinal Pain	34
4.4	Prevalence of Disc Degeneration in Asymptomatic Individuals and Patients with Lumbar Spinal Pain	34
4.5	Comparison of Somatic Referred and Radicular Pain	35
4.6	Alerting Features ('Red Flags') of Serious Conditions Associated with Acute Low Back Pain	36
4.7	Prevalence of Abnormalities on CT Scan in a Population of Asymptomatic Individuals Aged Between 21 and 80 Years	39
4.8	Prevalence of Abnormalities on MRI Scans of 67 Asymptomatic People	39
5.1	A Systematic Classification of Causes of Acute Thoracic Pain	67
5.2	Aspects of Clinical Presentation for a Series of 442 Patients with Pyogenic Infection of the Spine	68
5.3	Odds Ratios for Incident Fractures of the Thoracolumbar Spine for Back Pain and Disability in Women Over 50	69
5.4	Relative Prevalence of Local Causes of Thoracic Pain	72
5.5	Distribution of Agreement Amongst Four Examiners Concerning the Presence or Absence of Dysfunction in 10 Unmarked Thoracic Spinal Segments in 15 Subjects	73
5.6	Abnormal Palpatory Findings in Examination of Segments T1–8 in 25 Asymptomatic Subjects	74
5.7	Alerting Features of Serious Conditions Associated with Acute Thoracic Spinal Pain	75
5.8	Comparison of the Location of Pain in Patients with Scheuermann's Kyphosis with Age and Sex Matched Controls	76
5.9	Prevalence of Thoracolumbar Fractures in Patients by Age in 99 Patients with Blunt Trauma Prompting Radiological Investigation	76
5.10	Prevalence of Thoracic Spinal Fractures in Retrospective Studies of Blunt Trauma Victims in Trauma Centres on Whom Thoracolumbar Radiographs Were Performed	76
5.11	Risk Factors for Thoracolumbar Fracture in Patients with Blunt Trauma injuries Admitted to a Trauma Centre	77
6.1	Acute Neck Pain as the Principal Presenting Feature: Possible Causes	90
6.2	Medical, Social and Occupational Risk Factors Shown Not To Be Aetiological Risk Factors for Neck Pain	93
6.3	Medical, Social and Occupational Risk Factors Weakly Associated with Neck Pain	93
6.4	Psychosocial Risk Factors Shown Not To Be Related to Neck Pain	93
6.5	Alerting Features of Potentially Serious Conditions Associated with Acute Neck Pain	96
6.6	Factors Associated with Chronic Neck Pain After Whiplash: Insurance Data	102

6.7	Demographic and Clinical Factors Associated with Chronic Neck Pain After Whiplash	103
7.1	A Guide to Described Causes of Acute Shoulder Pain	125
7.2	Prevalence Rates of Some Conditions Causing Acute Shoulder Pain	128
7.3	Reliability of Symptoms Elicited by Two Experienced Clinicians	131
7.4	Validity of Histories of Rotator Cuff Lesions	131
7.5	Inter-Rater Reliability of Shoulder Range Incliniometry by Physiotherapists and Rheumatologists	132
7.6	Reliability of Physical Signs Elicited by Challenging Restraints	132
7.7	Validity of Physical Signs Elicited by Tests that Challenge Restraints to Shoulder Movement	133
7.8	Validity of Physical Signs of Impingement	133
7.9	Validity of Physical Signs of Rotator Cuff Lesions	133
7.10	Validity of Physical Signs of Biceps Tendon Lesions	134
7.11	Alerting Features of Serious Conditions Associated with Acute Shoulder Pain	134
7.12	Validity of Ultrasonography Versus Arthrography in the Diagnosis of Rotator Cuff Tears as Reported by Several Authors	136
7.13	Validity of Ultrasonography Versus Surgical Findings in the Diagnosis of Rotator Cuff Tears as Reported by Several Authors	136
7.14	Ultrasonographic Findings of Rotator Cuff Tears in People without Symptoms As Found in Two Studies	136
7.15	Inter-Observer Reliability of MRI in Diagnosis of Rotator Cuff Tears: Kappa Score Ranges Between Five Experienced Radiologists	137
7.16	Validity of MRI Versus Surgical Findings in the Diagnosis of Labral injuries as Reported by Several Authors	137
7.17	Validity of MRI Versus Surgical Findings in the Diagnosis of Rotator Cuff Tears as Reported by Several Authors	138
7.18	MRI Findings of Rotator Cuff Tears in 96 People Without Symptoms	138
7.19	MRI Findings of Rotator Cuff Tears in 100 People Without Symptoms	138
7.20	Prevalence of MRI 'Abnormalities' in People With and Without Symptoms	139
7.21	Reliability of Clinical Diagnosis of Shoulder Pain as Shown by Five Studies	140
7.22	Short Term Recovery of Acute Shoulder Pain	141
7.23	Longer Term Recovery of Acute Shoulder Pain	141
7.24	Recovery of Disability Associated with Acute Shoulder Pain	142
7.25	Biological Risk Factors for Shoulder Pain as Shown in Various Reports	143
7.26	Psychosocial Risk Factors for Shoulder Pain as Shown in Various Reports	143
8.1	Potential Causes of Anterior Knee Pain	160
8.2	Prevalence of Conditions Presenting as Anterior Knee Pain	163
8.3	Alerting Features of Serious Conditions Associated with Anterior Knee Pain	165
8.4	Natural History of Patellofemoral Pain: Summary of Study Results	170
9.1	Ideal Study Types for Clinical Questions	184
9.2	Levels of Evidence	184
9.3	Criteria for Categorising Interventions	186

List of Figures

2.1	Elements of a pain history.	18
2.2	Pain diagram.	18
2.3	Categorical pain rating scale.	19
2.4	Visual analogue scale.	19
2.5	Ten point numerical rating scale.	19
2.6	Management plan for acute musculoskeletal pain.	21
4.1	Waddell's physical signs: predictors of chronicity.	37
6.1	Criteria for not undertaking radiography in patients with a history of cervical spine trauma.	98
6.2	The Canadian C-Spine Rule.	99
7.1	Suggested terms to describe acute shoulder pain.	140

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Executive Summary

→ *This document is the outcome of a multi-disciplinary review of the scientific evidence for the diagnosis, prognosis and treatment of acute musculoskeletal pain. The evidence is summarised in the form of a management plan and key messages that may be used to inform practice. The aim in conducting an evidence review is to facilitate the integration of the best available evidence with clinical expertise and the values and beliefs of patients.*

The project was proposed and coordinated by Professor Peter Brooks, Executive Dean of the Faculty of Health Sciences, The University of Queensland. The guideline development process was overseen by a national steering committee and undertaken by multi-disciplinary review groups. Funding for the project was received from the Commonwealth Department of Health and Ageing.

The evidence review was conducted according to standards outlined by the National Health and Medical Research Council (NHMRC) (1999a) and in accordance with ideas expressed by the pioneer of evidence-based medicine, Dr Archie Cochrane (1977). Cochrane proposed the rationalisation of interventions (both diagnostic and therapeutic) to promote those with evidence of safety and effectiveness. To that end he suggested: promoting diagnostic tests likely to have a beneficial effect on prognosis, evaluating existing interventions to exclude those shown to be ineffective or dangerous, and determining the place of interventions when there is insufficient evidence of benefit.

Rationale

Pain and disability associated with musculoskeletal conditions represent a significant health burden in Australia. Musculoskeletal disorders (arthritis, and musculoskeletal conditions including osteoporosis) cost Australia in excess of 15 billion dollars per annum, including direct and indirect costs (Access Economics 2001a,b). This evidence review complements the government's acknowledgement of the importance of arthritis and musculoskeletal conditions and their designation of this field as Australia's 7th national health priority area. The project aligns with the international Bone and Joint Decade initiative, and its two major Australian partners, Osteoporosis Australia and Arthritis Australia.

Within this context, this review of the scientific evidence for the management of acute musculoskeletal pain aims to promote informed and effective management of such pain, empower consumers and advance understanding of acute musculoskeletal pain through identification of research needs.

Summaries of this document have been developed for clinicians and for patients to promote a collaborative approach to decision-making. This approach is particularly important when a range of management options exists, as patients will bear the consequences of decisions affecting their health (Charles et al. 1999). The summary documents are available at <http://www.nhmrc.gov.au>

Scope

- This document provides information on the management of acute pain, communication between clinicians and patients, and the diagnosis, prognosis and interventions for

acute low back, thoracic spine, neck, shoulder and anterior knee pain.

- The document is concerned only with the management of acute episodes of pain (less than three months duration) that are not associated with specific diseases and serious conditions. Discussion of the management of specific conditions is beyond the scope of this document.
- Existing unpublished draft guidelines developed by the Australasian Faculty of Musculoskeletal Medicine formed the basis for the document. Multi-disciplinary groups undertook the work of updating the draft guidelines. Information on how the existing work was updated is provided in each topic.
- Where sufficient evidence has been available, recommendations have been made; however the aim of this work is to provide clinicians and patients with information to guide decisions rather than being prescriptive.
- This master document containing the review of evidence serves as the source for summary publications for clinicians and patients. Same-source information promotes partnership in decision-making and facilitates the provision of informed consent.
- This document is not intended to, nor should there be any implication that it would be used in a regulatory fashion to dictate practice.
- The results of economic evaluations and cost information are included, where possible, to promote consideration of the efficient distribution of resources.

- A research agenda has been generated to highlight knowledge gaps in this area.
- The evidence contained in this document is current to January 2003. Search dates are specified in each guideline topic.

Summary of Findings

A number of themes have emerged from this review of the diagnosis, prognosis and treatment of acute musculoskeletal pain, forming the basis of the management plan:

- An episode of acute musculoskeletal pain is of short duration (less than three months). Recurrent episodes of acute musculoskeletal pain may occur, and a few people will develop chronic pain. Early identification of people at risk of chronic pain facilitates early intervention.
- Clinical assessment comprising a history and physical examination is important to identify features of rare but serious causes of acute musculoskeletal pain. In the majority of the remaining cases it is not possible to determine the cause of acute musculoskeletal pain and a specific diagnosis is not required for effective management.
- Ancillary investigations are generally not indicated for acute musculoskeletal pain.
- Simple interventions (providing information, assurance and encouraging reasonable maintenance of activity) may be all that are required for the successful management of acute musculoskeletal pain. These interventions can be used in combination with other non-pharmacological and pharmacological treatments.
- People with acute musculoskeletal pain should be reviewed to evaluate progress and to check for latent features of serious conditions ('red flags') and psychosocial and occupational factors ('yellow flags') that may influence recovery.
- Management of acute musculoskeletal pain involves a partnership approach; a management plan should be developed by the clinician and the patient and tailored to suit individual needs.

Limitations of Findings

- The vast majority of studies located in the search were performed in tertiary settings; there are limitations to applying the findings to other settings.
- There is both a lack of evidence (i.e. few or no studies conducted) and a lack of high quality, generalisable results in this area. The absence of evidence does not mean that an intervention is not efficacious.
- Insufficient or conflicting evidence for an intervention does not mean there is no benefit. Clinical decisions should be made with knowledge of the existing evidence and consideration of individual needs.
- There are limitations to the results of some systematic reviews as some have attempted to pool data from heterogeneous interventions. Specific and uniformly applied definitions for treatment modalities are required.
- There are difficulties in both locating and comparing the results of different studies due to the wide variety of terms used to describe acute musculoskeletal pain.
- The use of a variety of outcome measures limits the ability to compare results between studies.
- Few articles draw a distinction between acute and chronic durations of pain in relation to interventions for musculoskeletal pain. When there was a lack of studies involving specifically 'acute' populations, systematic reviews comprising a mixture of studies on acute and chronic populations were included.
- The decision to restrict the update of the evidence on interventions to Level I and II studies (with the exception of the thoracic spinal pain guidelines) precluded the inclusion of the results of Level III and IV studies on treatment.
- The authors acknowledge that the levels of evidence used in these guidelines were developed to rank studies of interventions and may not adequately reflect the study quality for other question types (e.g. diagnosis and prognosis), where cross-sectional and cohort studies may be the design of choice. An asterisk has been used to highlight this limitation to readers.

Summary of Key Messages: Acute Pain Management

EVIDENCE LEVEL	
Management Plan	
It is recommended that the clinician and patient develop a management plan for acute musculoskeletal pain comprising the elements of assessment, management and review: <ul style="list-style-type: none"> • Assessment — Conduct a history and physical examination to assess for the presence of serious conditions; ancillary investigations are not generally indicated unless features of serious conditions are identified. • Management — Provide information, assurance and advice to resume normal activity and discuss other options for pain management as needed. • Review — Reassess the pain and revise the management plan as required. 	CONSENSUS: Steering Committee
Non-Pharmacological Interventions	
Simple interventions (providing information, assurance and encouraging reasonable maintenance of activity) may be used alone or in combination with other interventions for the successful management of acute musculoskeletal pain.	CONSENSUS: Steering Committee
Pharmacological Interventions	
Specific pharmacological interventions may be required to relieve pain; such agents can be used in conjunction with non-pharmacological interventions.	CONSENSUS: Steering Committee; NHMRC 1999b

Acute Pain Management continued

Paracetamol or other simple analgesics, administered regularly, are recommended for relief of mild to moderate acute musculoskeletal pain.	CONSENSUS: Steering Committee; NHMRC 1999b
Where paracetamol is insufficient for pain relief, a non-steroidal anti-inflammatory (NSAID) medication may be used, unless contraindicated.	CONSENSUS: Steering Committee; NHMRC 1999b
Oral opioids may be necessary to relieve severe musculoskeletal pain. It is preferable to administer a short-acting agent at regular intervals, rather than on a pain-contingent basis. Ongoing need for opioid analgesia is an indication for reassessment.	CONSENSUS: Steering Committee; NHMRC 1999b
Adjuvant agents such as anticonvulsants and antidepressants are not recommended in the management of acute musculoskeletal pain.	CONSENSUS: Steering Committee; NHMRC 1999b
Any benefits from muscle relaxants may be outweighed by their adverse effects, therefore they cannot be routinely recommended.	CONSENSUS: Steering Committee

Summary of Key Messages: Effective Communication

	EVIDENCE LEVEL
Clinicians should work with patients to develop a management plan so that patients know what to expect, and understand their role and responsibilities.	CONSENSUS: Steering Committee
Information should be conveyed in correct but neutral terms, avoiding alarming diagnostic labels; jargon should be avoided.	CONSENSUS: Steering Committee
Explanation is important to overcome inappropriate expectations, fears or mistaken beliefs that patients may have about their condition or its management.	CONSENSUS: Steering Committee
Printed materials and models may be useful for communicating concepts.	CONSENSUS: Steering Committee
Clinicians should adapt their method of communication to meet the needs and abilities of each patient.	CONSENSUS: Steering Committee
Clinicians should check that information that has been provided has been understood; barriers to understanding should be explored and addressed.	CONSENSUS: Steering Committee

Summary of Key Messages: Acute Low Back Pain

DIAGNOSIS	EVIDENCE LEVEL
Aetiology and Prevalence	
The majority (approximately 95% of cases) of acute low back pain is non-specific; serious conditions are rare causes of acute low back pain.	*LEVEL I, III: Deyo et al. 1992; Suarez-Almazor et al. 1997; Hollingworth et al. 2002
Common findings in patients with low back pain (e.g. osteoarthritis, lumbar spondylosis, spinal canal stenosis) also occur in asymptomatic people; hence, such conditions may not be the cause of the pain.	*LEVEL I, III: van Tulder et al. 1997a; Torgerson and Dotter 1976
History	
History enables screening for features of serious conditions; however the reliability and validity of individual features in histories have low diagnostic significance.	*LEVEL III-2: Deyo et al. 1992; van den Hoogen et al. 1995
Physical Examination	
Clinical signs detected during physical and psychosocial assessment must be interpreted cautiously as many tests lack reliability and validity.	*LEVEL III-2: LeBoeuf-Yde et al. 2002; Truchon and Fillion 2000; Knutson 2002; Waddell et al. 1980; Deyo et al. 1992
A full neurological examination is warranted in the presence of lower limb pain and other neurological symptoms.	*LEVEL IV: Waddell et al. 1982; McCombe et al. 1989

Acute Low Back Pain continued

Ancillary Investigations	
Plain xrays of the lumbar spine are not routinely recommended in acute non-specific low back pain as they are of limited diagnostic value and no benefits in physical function, pain or disability are observed.	*LEVEL III-2: Suarez-Almazor et al. 1997; Hollingworth et al. 2002; Kendrick et al. 2001; Kerry et al. 2002
Appropriate investigations are indicated in cases of acute low back pain when alerting features ('red flags') of serious conditions are present.	*LEVEL III-2: Deyo and Diehl 1986
Terminology	
A specific patho-anatomic diagnosis is not necessary for effective management of acute non-specific low back pain.	CONSENSUS: Steering Committee
Terms to describe acute low back pain with no identifiable pathology include 'lumbar spinal pain of unknown origin' or 'somatic lumbar spinal pain'.	*LEVEL IV: Merskey and Bogduk 1994
PROGNOSIS	EVIDENCE LEVEL
The majority of people with a short duration of symptoms upon presentation with low back pain recover within three months; however milder symptoms often persist.	*LEVEL III-2: Croft and Rigby 1994; Schiottz-Christensen et al. 1999
Recurrences of acute low back pain are not uncommon.	*LEVEL III-3: van den Hoogen et al. 1998; Hurley et al. 2001a
Psychosocial and occupational factors ('yellow flags') appear to be associated with progression from acute to chronic pain; such factors should be assessed early to facilitate intervention.	*LEVEL III-2: Linton 2001; Pincus et al. 2002; Truchon and Fillion 2000
INTERVENTIONS	EVIDENCE LEVEL
Evidence of Benefit	
<p><i>Advice to Stay Active (Activation)</i> — Advice to stay active provides a small beneficial effect on pain, rate of recovery and function compared to bed rest and compared to a specific exercise regime in mixed populations with low back pain.</p> <p>Advice to stay active reduces sick leave compared to bed rest in mixed populations with low back pain.</p>	LEVEL I, II: Based on systematic reviews (Waddell et al. 1997; Hagen et al. 2002; Hilde et al. 2002) and one additional study (Rozenberg et al. 2002)
<p><i>Heat Wrap Therapy</i> — Continuous low level heat wrap therapy reduces pain, stiffness and disability extending for three to four days compared with paracetamol, NSAIDs or placebo alone during the first 48 hours of acute low back pain. (This treatment is not routinely available in Australia).</p>	LEVEL II: Based on one study (Nadler et al. 2002)
<p><i>Patient Information (Printed)</i> — Novel or 'activity-focused' printed information plus similar verbal advice provided by a clinician is more effective compared to traditional brochures or no printed information in acute low back pain.</p> <p>Printed information provided through the mail is less likely to have an effect on pain, disability and sick leave compared to information provided in person.</p> <p>Behavioural therapy interventions are more effective than printed information for preventing long-term disability in mixed populations.</p>	LEVEL II: Based on controlled trials (Cherkin et al. 1996; Cherkin et al. 1998; Burton et al. 1999; Hazard et al. 2000; Roberts et al. 2002; Linton and Andersson 2000)
Conflicting Evidence	
<p><i>Muscle Relaxants</i> — There is conflicting evidence that muscle relaxants are effective compared to placebo in acute low back pain.</p> <p>There is insufficient evidence to determine whether muscle relaxants are more or less effective compared to NSAIDs for acute low back pain.</p> <p>Drowsiness, dizziness and dependency are common adverse effects of muscle relaxants.</p>	LEVEL I: Based on systematic reviews (Bigos et al. 1994; van Tulder et al. 1997b) that found numerous RCTs

Acute Low Back Pain continued

<p>Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) — There is conflicting evidence that oral and injectable NSAIDs are effective versus placebo or no treatment for acute low back pain.</p> <p>NSAIDs have a similar effect compared to opioid analgesics, combined paracetamol-opioid analgesics and to each other in their effect on acute low back pain.</p> <p>There is insufficient evidence that NSAIDs are more effective when compared to muscle relaxants and anti-anxiety agents in acute low back pain.</p> <p>NSAIDs are less effective in reducing pain than heat wrap therapy in the first three to four days of acute low back pain.</p> <p>Serious adverse effects of NSAIDs include gastrointestinal complications (e.g. bleeding, perforation).</p>	<p>LEVEL I, II: Based on systematic reviews (Bigos et al. 1994; van Tulder et al. 1997b; van Tulder et al. 2002f; Koes et al. 1997) and numerous RCTs (Amlie et al. 1987; Basmajian 1989; Postacchini et al. 1988; Lacey et al. 1984; Nadler et al. 2002)</p>
<p>Spinal Manipulation — There is conflicting evidence that spinal manipulation provides pain relief compared to placebo in the first two to four weeks of acute low back pain.</p> <p>There is insufficient evidence that spinal manipulation is more or less effective than other conservative treatments for acute low back pain.</p> <p>Adverse effects of spinal manipulation are rare but potentially serious.</p>	<p>LEVEL I, II: Based on systematic reviews (van Tulder et al. 1997b; Bigos et al. 1994; Koes et al. 1996; Mohseni-Bandpei et al. 1998; Shekelle et al. 1992) and one RCT (Hsieh et al. 2002)</p> <p>LEVEL IV: Based on reviews of case studies (Haldeman and Rubinstein 1992; Assendelft et al. 1996; Stevinson and Ernst 2002)</p>
<p>Insufficient Evidence</p>	
<p>Acupuncture — There is insufficient evidence that acupuncture (dry-needling) is effective compared to injection therapy in acute low back pain.</p> <p>Adverse effects of acupuncture are rare but potentially serious.</p>	<p>LEVEL I: Based on a systematic review (van Tulder et al. 2002a) and one study (Garvey et al. 1989)</p>
<p>Analgesics, Compound and Opioid — There are no randomised controlled trials investigating the efficacy of opioids and compound analgesics in acute low back pain.</p> <p>There is evidence that the effect of opioid or compound analgesics is similar to NSAIDs for treatment of acute low back pain.</p> <p>In general, opioids and compound analgesics have a substantially increased risk of side effects compared with paracetamol alone.</p>	<p>No Level I or II evidence</p> <p>LEVEL I: Based on systematic reviews (van Tulder et al. 1997b; Bigos et al. 1994) and RCTs (Brown et al. 1986; Videman et al. 1984; Palangio et al. 2002)</p>
<p>Analgesics, Simple — There are no randomised controlled trials assessing the effectiveness of simple analgesics in acute low back pain.</p> <p>There is insufficient evidence for the effectiveness of simple analgesics versus NSAIDs in acute low back pain.</p> <p>Paracetamol is less effective than heat wrap therapy in acute low back pain.</p> <p>There is insufficient evidence for the effect of paracetamol compared to electroacupuncture in mixed populations with low back pain.</p>	<p>No Level I or II evidence</p> <p>LEVEL I, II: Based on systematic reviews (Bigos et al. 1994; van Tulder et al. 1997b) of studies by Milgrom et al. 1993; Wiesel et al. 1980; Hackett et al. 1988</p>
<p>Back Exercises — McKenzie therapy provides similar pain and function outcomes compared to usual care in acute low back pain.</p> <p>There is conflicting evidence for the efficacy of back exercises in reducing pain and disability compared to other active and inactive treatments in mixed populations with low back pain.</p> <p>McKenzie therapy reduces pain and sick leave compared to one back school session, results in similar global improvement compared to manipulation and provision of an educational booklet and provides better functional and pain outcomes compared to flexion exercises in mixed populations with low back pain.</p> <p>Lateral multifidus muscle exercises reduce recurrences of low back pain compared to usual care in mixed populations with low back pain.</p>	<p>LEVEL I, II: Based on systematic reviews (Bigos et al. 1994; van Tulder et al. 1997b; van Tulder et al. 2002d) of multiple controlled studies</p>

Acute Low Back Pain continued

<p>Back School — There is insufficient evidence that back school is more effective in reducing pain compared to active and passive therapies and to placebo in acute low back pain.</p> <p>There is insufficient evidence that back school is more effective in reducing pain compared to placebo and other treatments in mixed populations with low back pain.</p>	<p>LEVEL I, II: Based on systematic reviews (van Tulder et al. 1997b; van Tulder et al. 2002b) and an RCT by Hsieh et al. (2002)</p>
<p>Bed Rest — There is insufficient evidence that bed rest is more effective compared to advice to stay active, back exercises, spinal manipulation, non-steroidal anti-inflammatory drugs or no treatment in mixed populations with low back pain.</p> <p>There is conflicting evidence that bed rest increases disability and rate of recovery compared to staying active in mixed populations with low back pain.</p> <p>Bedrest for longer than two days increases the amount of sick leave compared to early resumption of normal activity in acute low back pain.</p> <p>There is evidence that prolonged bed rest is harmful.</p>	<p>LEVEL I, II: Based on systematic reviews (van Tulder et al. 1997b; Hagen et al. 2002) and an RCT (Rozenberg et al. 2002)</p>
<p>Cognitive Behavioural Therapy — Cognitive behavioural therapy reduces general disability in the long term compared to traditional care in mixed with populations back pain.</p> <p>Group cognitive behavioural therapy sessions may reduce sick leave and health care utilisation in the long term compared to general educational information in mixed populations with back pain.</p> <p>While cognitive behavioural strategies are often included as part of specific interventions for acute low back pain such as exercise and activity restoration, there are no studies on this approach as a single intervention.</p>	<p>LEVEL I: Based on systematic reviews (Turner 1996; van Tulder et al. 2002e)</p> <p>LEVEL II: Based on studies by Linton and Andersson (2000) and Linton and Ryberg (2001)</p> <p>No Level I or II studies</p>
<p>Electromyographic Biofeedback — There are no controlled studies testing the effectiveness of electromyographic biofeedback in acute low back pain.</p>	<p>No Level I or II evidence</p>
<p>Injection Therapy — There is insufficient evidence demonstrating the effectiveness of injection therapy (facet joint, epidural or soft tissue) in the treatment of acute low back pain.</p> <p>Adverse effects of injection therapy are rare but serious.</p>	<p>LEVEL I, II: Based on systematic reviews (Nelemans et al. 2002; Watts and Silagy 1995; Koes et al. 1999) and an RCT (Garvey et al. 1989)</p>
<p>Lumbar Supports — There are no controlled studies on the effect of lumbar supports in acute low back pain.</p> <p>There is insufficient evidence that lumbar supports are effective in reducing pain compared to spinal manipulation, exercises, massage, TENS and simple analgesia in mixed populations with low back pain.</p>	<p>No Level I or II evidence</p> <p>LEVEL I: Based on two systematic reviews (van Tulder et al. 2002c; Bigos et al. 1994)</p>
<p>Massage — There are no controlled studies for massage therapy in acute low back pain.</p> <p>Massage is superior to placebo (sham laser) and acupuncture in mixed populations with low back pain.</p> <p>Massage provides similar effect to back schools (involving exercise and education), corsets and TENS in mixed populations with low back pain.</p> <p>There is conflicting evidence of the effect of massage compared to manipulation and education in mixed populations with low back pain.</p>	<p>No Level I or II evidence</p> <p>LEVEL I, II: Based on systematic reviews (Furlan et al. 2002; Ernst 1999) and RCTs (Cherkin et al. 2001; Preyde 2000)</p>
<p>Multi-Disciplinary Treatment in the Workplace — There are no controlled studies on the effect of multi-disciplinary treatment in the workplace in acute low back pain.</p> <p>Multi-disciplinary treatment in the workplace improves return to work and subjective disability compared to usual care in mixed populations with low back pain.</p>	<p>No Level I or II evidence</p> <p>LEVEL I, II: Based on a systematic review (Karjailanen et al. 2002) and RCTs (Loisel et al. 1997; Lindstrom 1992a,b)</p>
<p>Topical Treatment — There is insufficient evidence for the effectiveness of spiroflar homeopathic gel or cremol capsici for treatment of acute low back pain.</p>	<p>LEVEL II: Based on one RCT (Stam et al. 2001)</p>

Acute Low Back Pain continued

<p>Traction — There are no controlled studies on the effect of traction for acute low back pain.</p> <p>There is insufficient evidence that traction is effective compared to placebo and compared to other treatments in mixed populations with low back pain.</p> <p>Adverse effects from traction have been reported, including reduced muscle tone, bone demineralisation, thrombophlebitis.</p>	<p>No Level I or II evidence</p> <p>LEVEL I: Based on systematic reviews (van der Heijden et al. 1995; van Tulder et al. 1997b)</p>
<p>Transcutaneous Electrical Nerve Stimulation — There are no controlled studies on the effect of TENS in acute low back pain.</p> <p>There is insufficient evidence for the effectiveness of TENS compared to exercises, back books, massage, corset use and simple analgesia in mixed populations with low back pain.</p>	<p>No Level I or II evidence</p> <p>LEVEL I, II: Based on a systematic review (van Tulder et al. 1997b) and additional studies (Pengel et al. 2002; Hurley et al. 2001b)</p>
<p>Cost Effectiveness — Published data is very limited; however there is some evidence that advice to maintain usual activities, provision of an education booklet and community-based exercises appear to be cost effective first line interventions for acute low back pain.</p>	<p>LEVEL II: Malmivaara et al. 1995; Cherkin et al. 1998; Moffet et al. 1999</p>

Summary of Key Messages: Acute Thoracic Spinal Pain

DIAGNOSIS	EVIDENCE LEVEL
Aetiology and Prevalence	
Pain may be referred to the upper thoracic spine from visceral structures and cervical spinal structures or arise in the thoracic interspinous ligaments, paravertebral muscles and zygapophyseal joints	*LEVEL IV: Kelley 1997; Dwyer et al. 1990; Aprill et al. 1990; Fukui et al. 1996; Feinstein et al. 1954; Kellgren et al. 1939; Hockaday and Whitty 1967; Cloward 1959; Kellgren 1939; Dreyfuss et al. 1994
Men and women aged over 60 are at risk for spontaneous osteoporotic fractures of the thoracic spine; extent of vertebral deformity and multiple fractures appear linked with pain intensity.	*LEVEL IV: Ross et al. 1994; Patel et al. 1991; Huang et al. 1994
Clinicians should be alert to the potential for rare, serious conditions presenting as acute thoracic spinal pain; however most cases of thoracic spinal pain are of mechanical origin.	*LEVEL IV: Deyo and Diehl. 1988
History	
History serves to differentiate sources of acute thoracic spinal pain to identify features of potentially serious conditions; however it carries little diagnostic weight.	CONSENSUS: Flynn 1996; Kenna and Murtagh 1989; Corrigan and Maitland 1988
Physical Examination	
The reliability of palpation for tenderness of the thoracic spine is good but its validity is unknown.	*LEVEL IV: Christensen et al. 2002
The reliability of motion palpation of the thoracic spine is marginal.	*LEVEL IV: Love et al. 1987; Christensen et al. 2002
Following blunt trauma, a negative clinical examination in the presence of a clear sensorium makes a thoracic spinal fracture unlikely.	*LEVEL IV: Durham et al. 1995; Samuels and Kerstein 1993
Despite the absence of supportive, scientific data on the utility of physical examination of the thoracic spine, such examination provides an important opportunity to identify features of serious conditions.	*LEVEL IV: Deyo et al. 1988; Malawaski et al. 1991; Durham et al. 1995; Samuels and Kerstein 1993
Ancillary Investigations	
In the absence of trauma, plain radiography is of limited use in defining the cause of pain.	*LEVEL IV: Wood et al. 1995; Nathan 1962; Crawford and Singer 1995
Fractures are more likely to occur in people over age 60 with a history of blunt trauma; a lower threshold for investigation is warranted in this group.	*LEVEL IV: Frankel et al. 1994; Durham et al. 1995; Meldon and Moettus. 1995; Samuels and Kerstein 1993