



Australian and New Zealand College  
of Anaesthetists and Faculty of Pain Medicine

# ACUTE PAIN MANAGEMENT: SCIENTIFIC EVIDENCE

Third Edition 2010

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# Acute Pain Management: Scientific Evidence

Australian and New Zealand  
College of Anaesthetists  
and Faculty of Pain Medicine



## Endorsed by:

Faculty of Pain Medicine, Royal College of Anaesthetists, United Kingdom	Faculty of Pain Medicine, College of Anaesthetists of Ireland
Royal College of Anaesthetists, United Kingdom	Hong Kong College of Anaesthesiologists
Australian Pain Society	Hong Kong Pain Society
Australasian Faculty of Rehabilitation Medicine	Malaysian Association for the Study of Pain
College of Anaesthesiologists, Academy of Medicine, Malaysia	New Zealand Pain Society
College of Anaesthesiologists, Academy of Medicine, Singapore	Pain Association of Singapore
College of Intensive Care Medicine of Australia and New Zealand	Royal Australian and New Zealand College of Psychiatrists
	Royal Australasian College of Physicians
	Royal Australasian College of Surgeons

## Recommended to members:

American Academy of Pain Medicine

## Also endorsed by:

International Association for the Study of Pain



Approved by the NHMRC on 4 February 2010

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ISBN Print: 978-0-977517-4-4-2 Online: 978-0-9775174-5-9

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This document should be cited as:

Macintyre PE, Schug SA, Scott DA, Visser EJ, Walker SM; APM:SE Working Group of the Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine (2010), *Acute Pain Management: Scientific Evidence* (3rd edition), ANZCA & FPM, Melbourne.

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### **Acknowledgements**

The production of a document such as this requires a considerable amount of time over a long period. Although institutional support in terms of time and resources came from a number of centres, in particular the editors would like to thank the Department of Anaesthesia, Hyperbaric Medicine and Pain Medicine at the Royal Adelaide Hospital for its generous support and assistance during the development of this edition. They also wish to acknowledge the support of the Department of Anaesthesia and Pain Medicine at the Royal Perth Hospital, the Department of Anaesthesia, St Vincent's Hospital, Melbourne and The Portex Unit: Pain Research UCL Institute of Child Health and Great Ormond St Hospital, London.

Special thanks are also extended to Professor Paul Myles for his assistance in relation to assessment of the meta-analyses that could have been affected by retracted articles (see Introduction and Appendix B for details), to Dr Dan Carr for his guidance in this matter, to Dr Rowan Thomas for his significant contribution to the web site development which underpinned the review process, and to Professor Michael Cousins for his advice and assistance throughout the development process.

### **NHMRC approval**

These guidelines were approved by the NHMRC on 4 February 2010, under Section 14A of the *National Health and Medical Research Council Act 1992*. Approval for the guidelines by NHMRC is granted for a period not exceeding five years, at which date the approval expires. The NHMRC expects that all guidelines will be reviewed no less than once every five years. Readers should check with the Australian and New Zealand College of Anaesthetists for any reviews or updates of these guidelines.

### **Disclaimer**

This document aims to combine a review of the best available evidence for acute pain management with current clinical and expert practice, rather than to formulate specific clinical practice recommendations. It is designed to provide information based on the best evidence available at the time of publication to assist in decision-making. The information provided is not intended to over-ride the clinical expertise of health care professionals and its use is subject to the clinician's judgement and the patient's preference in each individual case. There is no substitute for the skilled assessment of each individual patient's health status, circumstances and perspectives, which health care practitioners will then use to select the treatments that are relevant and appropriate to that person.

This document can be downloaded from the ANZCA website: <http://www.anzca.edu.au/resources/books-and-publications/>. Copies of the document can be ordered through the Australian and New Zealand College of Anaesthetists on +61 3 9150 6299.

# FOREWORD

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Less than a generation ago the prevalent attitude towards acute pain was widespread acceptance as inevitable, and frequent indifference to its suboptimal management. Now, proper pain management is understood to be a fundamental human right and integral to the ethical, patient-centred and cost-effective practice of modern medicine. This progress is the result of dedicated efforts by health care professionals worldwide, including many in Australia and New Zealand who have contributed to past and present editions of *Acute Pain: Scientific Evidence*. The consistently high standards of *Acute Pain: Scientific Evidence* have established it as the foremost English-language resource of its type worldwide. Changes between successive editions reflect not simply accumulation of clinical evidence in this dynamic field, but also advancing sophistication in methods of evidence synthesis and decision support. Chaired by Associate Professor Pam Macintyre, assisted by many contributors and a distinguished editorial subgroup of Professor Stephan Schug, Associate Professor David Scott, Dr Eric Visser and Dr Suellen Walker, the working party responsible for the Third Edition of *Acute Pain: Scientific Evidence* have continued to aggregate new clinical evidence and to expand the range of topics. Even more, they have synthesised and presented the consolidated evidence in a clear, user-friendly fashion and highlighted instances where prior editions' conclusions have been altered by new findings.

The use of objective clinical evidence to provide a rational basis for practice is an old concept. In the Old Testament, the Book of Daniel clearly recounts a prospective case-controlled trial. Socrates advocated clinical outcomes assessment as the basis for annual reappointment of state physicians. Yet, aware that an evidence-informed approach to patient care has recently at times inappropriately been used as a rationale for restricting the range of therapeutic options available to patients, the authors of the third edition counsel that 'while knowledge of current best evidence is important, it plays only a part in the management of acute pain for any individual patient and more than evidence is needed if such treatment is to be effective.' Personalised medicine and individualised care — in part necessitated by genetic differences in drug metabolism and action, as discussed in the third edition — require such a balanced approach. Cochrane himself voiced disdain for 'the considerable pressure...to provide physicians with a simple rule to tell them what it all meant' [Cochrane AL: *Effectiveness and Efficiency: Random Reflections on Health Services*. Cambridge (UK): Cambridge University Press, 1989, p. 41].

The first edition of *Acute Pain: Scientific Evidence* (led by MJC) and its counterpart US federal guideline over a decade ago (led by DBC) noted the clinical impression that undertreated acute pain may have damaging long-term consequences. Subsequent epidemiologic evidence now affirms this clinical insight and indicates that for some patients debilitating persistent pain can be averted by minimisation of acute pain after surgery or trauma. Even if it is not possible to prevent the transition from acute to chronic pain in every case, early recognition and treatment of incipient chronic pain by a vigilant healthcare system is necessary for cost-effective intervention. The National Pain Strategy document that underpins the 2010 Australian Pain Summit summarises the emerging literature on social, human and economic costs of undertreated acute and chronic pain — establishing pain as a major disease burden ([www.painsummit.org.au](http://www.painsummit.org.au)) and proposing an integrated new framework for management of acute, chronic and cancer pain. This historic summit also reiterated that apart from considerations of reduced cost and increased efficiency, ethical medical practice mandates prevention of unnecessary pain and suffering. Further the Summit Strategy draws heavily upon

the scientific evidence and clinical practice of acute pain management that is the subject of this volume. The dedicated efforts of Dr Macintyre and colleagues to summarise the scientific evidence on acute pain management play an important role in shaping pain-related practice and policy worldwide. All those who care for patients or family members in pain, or who may one day suffer pain themselves, are in their debt.

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# INTRODUCTION

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This is the third edition of the document *Acute Pain Management: Scientific Evidence*. The first edition was written by a multidisciplinary committee headed by Professor Michael Cousins and published by the National Health and Medical Research Council (NHMRC) of Australia in 1999. The second edition was written by multiple contributors and a working party chaired by Assoc Prof Pam Macintyre. It was approved by the NHMRC and published by the Australian and New Zealand College of Anaesthetists (ANZCA) and its Faculty of Pain Medicine (FPM) in 2005. It was also endorsed by a number of major organisations — the International Association for the Study of Pain (IASP), the Royal College of Anaesthetists (United Kingdom), the Australasian Faculty of Rehabilitation Medicine, the Royal Australasian College of Physicians, the Royal Australasian College of Surgeons, the Royal Australian and New Zealand College of Psychiatrists and the Australian Pain Society — and recommended to its members by the American Academy of Pain Medicine.

After publication, a companion document for consumers — *Managing Acute Pain: a Guide for Patients* — was prepared and approved by the NHMRC (ANZCA & FPM 2005).

In accord with NHMRC requirements that documents such as these be revised as further evidence accumulates, and as there had been an ongoing and substantial increase in the quantity and quality of information available about acute pain management, it was seen as timely to reassess the available evidence. ANZCA and the FPM therefore again took responsibility for revising and updating the document — this third edition. As with the second edition, this third edition has been endorsed by a number of key professional organisations (see list on the title page). It was also approved by the NHMRC on 4th February 2010, under section 14A of the *National Health and Medical Research Council Act 1992*.

A working party was convened to coordinate and oversee the development process. An editorial subgroup of the working party (Assoc Prof Pam Macintyre, Prof Stephan Schug, Assoc Prof David Scott, Dr Eric Visser and Dr Suellen Walker) coordinated the development process and edited and/or wrote the sections. The working party also included Dr Douglas Justins, Dean of the Faculty of Pain Medicine, Royal College of Anaesthetists in the United Kingdom, and Prof Karen Grimmer-Somers from the University of South Australia, who was the NHMRC-appointed Guidelines Assessment Register representative for the second edition and provided expert advice on the use of evidence-based findings and the application of NHMRC criteria for this edition.

A large panel of contributors was appointed to draft sections of the document and a multidisciplinary consultative committee was chosen to review the early drafts of the document and contribute more broadly as required. To ensure general applicability and inclusiveness, there was a very wide range of experts on the contributor and multidisciplinary committee, including medical, nursing, allied health and complementary medicine clinicians and a consumer. Comments on the document were also invited during a public consultation period. Details of the processes involved are outline in Appendix B, *Process Report*.

*Acute Pain Management: Scientific Evidence* covers a wide range of clinical topics. The purpose of the document is, as with the first two editions, to combine a review of the best available evidence for acute pain management with current clinical and expert practice, rather than to formulate specific clinical practice recommendations. Accordingly, the document aims to summarise the substantial amount of evidence currently available for the management of acute pain in a concise and easily readable form to assist the practising clinician. New and updated content has been incorporated with the content of the previous version of the document.

It is recognised that while knowledge of current best evidence is important, it plays only a part in the management of acute pain for any individual patient and more than evidence is needed if such treatment is to be effective.

Evidence-based medicine has been defined as ‘the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients’ and that it must ‘integrate research evidence, clinical expertise and patient values’ (Sackett et al, 1996). Therefore evidence, clinical expertise and, importantly, patient participation (ie including the patient as part of the treating and decision-making team, taking into account their values, concerns and expectations) are required if each patient is to get the best treatment. The information provided in this document is not intended to over-ride the clinical expertise of healthcare professionals. There is no substitute for the skilled assessment of each individual patient’s health status, circumstances and perspectives, which healthcare professionals will then use to help select the treatments that are relevant and appropriate to that patient.

## Review of the evidence

This document is a revision of the second edition of *Acute Pain Management: Scientific Evidence*, published in 2005. Therefore, most of the new evidence included in the third edition has been published from January 2005 onwards. Evidence-based guidelines have been published in the areas of acute back and musculoskeletal pain, and recommendations relevant to the management of the acute phase of these conditions were drawn directly from these.

For more details on the review of the evidence see Appendix B, *Process Report*.

## Levels of evidence

Levels of evidence were documented according to the NHMRC designation (NHMRC, 1999)

Levels of evidence	
I	Evidence obtained from a systematic review of all relevant randomised controlled trials
II	Evidence obtained from at least one properly designed randomised controlled trial
III-1	Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method)
III-2	Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-controlled studies or interrupted time series with a control group
III-3	Evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group
IV	Evidence obtained from case series, either post-test or pre-test and post-test
Clinical practice points	
<input checked="" type="checkbox"/>	Recommended best practice based on clinical experience and expert opinion

## Key messages

Key messages for each topic are given with the highest level of evidence available to support them, or with a symbol indicating that they are based on clinical experience or expert opinion. In the key messages, Level I evidence from the Cochrane Database is identified. Levels of evidence were documented according to the NHMRC designation and, as for the second edition of this document, clinical practice points have been added.

It was felt that there should be an indication of how the key messages in this third edition related to those in the second edition. The system used by Johnston et al (Johnston et al, 2003)

to reflect the implications of new evidence on clinical recommendations was therefore reviewed and adapted. Where the new evidence led to reversal of a conclusion and key message, this was noted in the text.

Review and revision of key messages	
<b>New</b>	New evidence leads to new key message(s).
<b>Unchanged</b>	The new evidence is consistent with the data used to formulate the original key message. The key message in the original report remains unchanged.
<b>Strengthened</b>	The new evidence is consistent with the data used to formulate the original key message. The key message in the original report remains unchanged or expanded. The level of evidence and/or content of the key message in the original report has been strengthened to reflect this additional evidence.
<b>Weakened</b>	The new evidence is inconsistent with the data used to inform the original key message(s). However, the new evidence does not alter the key message but weakens the level of evidence.
<b>Qualified</b>	The new evidence is consistent with the data used to formulate the original key message. The key message in the original report remains unchanged but applicability may be limited to specific patient groups/ circumstances.
<b>Reversed</b>	The new evidence is inconsistent with the data used to inform the original key message(s). The strength of the new evidence alters the conclusions of the original document.
<b>NB</b>	Clinical and scientific judgment informed the choices made by the Working Party members; there was no mandatory threshold of new evidence (eg number of studies, types of studies, magnitude of statistical findings) that had to be met before classification to categories occurred.  The first letter of each of the words ( <b>N</b> ew, <b>U</b> nchanged etc) was used to denote the changes (if any) from the last edition of this document.

### *Management of retracted publications*

In May 2009, two editorials (Shafer et al, 2009; White et al, 2009) were published in *Anesthesia and Analgesia* giving details of 21 publications that had been retracted by a number of journals because of allegations of scientific fraud. The editorial by Shafer (Shafer et al, 2009) contains a list of the retracted articles. This list can also be found at <http://www.aeditor.org/HWP/Retraction.Notice.pdf>.

The position of the journal was that unretracted articles 'remain part of the unimpeached literature, at least for now'. In a companion editorial White et al (White et al, 2009) reviewed both the retracted and unimpeached literature, 'distinguishing our understandings that remain fully supported from those that are no longer supported by the unimpeached literature.' Also in May 2009, Eisenach (Eisenach, 2009), the editor of *Anesthesiology*, presented a graph of numbers of citations of retracted and unretracted articles affected by this issue and called for research re-examining the conclusions of the retracted articles.

A July 2009 editorial by Neal (Neal, 2009) described contact with 'the lead or high ranking authors' of six original articles and one review article in that editor's journal and which had not been retracted. These articles are listed in this editorial. He concluded that 'Based on the attestations of the involved coauthors and the investigations of the Chief Academic Officer of Baystate Medical Center, the Editorial Board of *Regional Anesthesia and Pain Medicine* is comfortable recommending that practitioners continue to make clinical decisions based on the information contained within the seven below cited articles.'

Of the references listed in the May 2009 retraction notice (Shafer, 2009), four were included in the second edition of *Acute Pain Management: Scientific Evidence* along with a further two publications that were not included in this list of retractions.

There are no precedents for how best to manage a problem such as this. However, the editors responsible for the development of this third edition of *Acute Pain Management: Scientific Evidence* decided against including any publications by the individuals affected by these retractions when listed as first author on the papers. An assessment was made of each of the meta-analyses that cited affected articles. This was based upon the other papers included in these meta-analyses, other supporting evidence and independent consideration by an expert in biostatistics. In some cases, although cited, the affected references were not actually included in the meta-analysis performed. In other cases, assessment indicated that the strength of the evidence may be reduced because of the inclusion of affected publications.

Following the consensus that appeared to rapidly emerge among editors of the leading peer-reviewed journals in anaesthesiology and pain medicine despite initial concerns about meta-analyses that included this work (White et al, 2009), the editors of the third edition of *Acute Pain Management: Scientific Evidence* felt that indiscriminately omitting all meta-analyses purely on the basis of inclusion of one or two of those papers would be to deny inclusion of some important credible information in the document. Indeed, the purpose of meta-analysis is to aggregate results from the literature as a whole, thereby diluting the impact of any one specific study.

Just prior to finalisation of this third edition of *Acute Pain Management: Scientific Evidence*, an article was published in *Anesthesiology* in December 2009 (Marret et al, 2009) which examined in detail the effect that excluding data obtained from the retracted articles would have on the results of 14 systematic reviews (six quantitative and eight qualitative) in which they were cited. Marret et al (2009) reanalysed the data after excluding results from affected articles and concluded that withdrawal of these articles did not alter the conclusions of five out of the six quantitative reviews (meta-analyses): the sixth meta-analysis has not been included in *Acute Pain Management: Scientific Evidence*. Thus there was agreement with the assessments that had already made about the validity of these meta-analyses which included the retracted articles. Marret et al (2009) concluded that meta-analyses were ‘vulnerable’ if data from retracted studies made up more than 30% of the total.

A footnote has been added to the relevant sections indicating the systematic reviews (quantitative and qualitative) that included affected articles along with a summary of the effect, if any, on the results obtained. Also, specific note has been made in the text of the third edition of *Acute Pain Management: Scientific Evidence* where retraction of the affected papers involved key messages that were published in the second edition. Should additional information become available it will be added as needed before publication of this document. Information that comes to light after publication will be posted as appropriate on the *Acute Pain Management: Scientific Evidence* website.

## INN drug names

This document uses the generic names of drugs that apply in Australia and New Zealand. Where this differs from the International Nonproprietary Name (INN), the INN is given in brackets on first use within each of the major sections.

### Pam Macintyre

On behalf of the Working Group of the Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine

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