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## Evidence and methods in back pain research

Steven J. Kamper<sup>a, b, \*</sup>, Christopher M. Williams<sup>a, c, d</sup><sup>a</sup> Centre for Pain, Health and Lifestyle, Australia<sup>b</sup> School of Public Health, Sydney Medical School, University of Sydney, Sydney, Australia<sup>c</sup> Hunter Medical Research Institute, School of Medicine and Public Health, University of Newcastle, Newcastle, Australia<sup>d</sup> Hunter New England Population Health, Hunter New England Local Health District, Newcastle, Australia

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Back Pain focussed editions of *Best Practice & Research Clinical Rheumatology* published in 2010 and 2013 have highlighted the burden of back pain on individuals and to societies across the globe. The scale of the impact of the condition is enormous and presents challenges to the organisation of healthcare systems everywhere. These challenges extend to individual clinicians who are faced with increasing numbers of patients disabled by pain and often constrained by availability of time and resources. In the course of their practice, they must handle considerable uncertainty regarding diagnosis, prognosis and treatment effectiveness.

In this context, the current edition aims to provide a contemporary reference for evidence-based practitioners and researchers working in the field of back pain. The chapters are organised into three themes:

1. current understanding of back pain management
2. research in underserved areas
3. new directions

The authors of each chapter were asked to address two broad aims within their topic: (1) to present an overview of current evidence and (2) to comment on the critical methodological considerations that are necessary for interpretation of the evidence.

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\* Corresponding author. Centre for Pain, Health and Lifestyle, Australia.

E-mail address: [steven.kamper@sydney.edu.au](mailto:steven.kamper@sydney.edu.au) (S.J. Kamper).

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## Current understanding of back pain management

Using the framework of clinical practice guidelines, O'Connell et al. provide a synthesis of current evidence for the treatment of back pain. Recent updates of major international guidelines published in the UK and Canada provide the opportunity to overview the state of research regarding treatment effectiveness. Along with this synopsis, the methods of guideline development are appraised and critical commentary provided on the various processes. This offers clinicians an insight into how recommendations are made and facilitates their own appraisal of clinical practice guidelines. Alongside clinical effectiveness, issues of cost-effectiveness are important drivers of healthcare practice. Van Dongen et al. collect the current evidence for the cost-effectiveness of treatments for back pain to provide a systems perspective to the edition and give readers an overview of this key input into policy. Their methodological overview identifies gaps in our knowledge and describes priorities and guidance for future research efforts. As the past few decades have seen a move towards understanding back pain from a behavioural perspective, so have self-management and behaviour change interventions become increasingly recommended. Mansell et al. review the evidence regarding the effectiveness of these types of interventions and describe the theoretical and operational processes that underpin their development. Reliable and valid measurement of outcome is fundamental to the operation of evidence-based healthcare. Ensuring optimal and standardised choice of outcome measures enables reliable evaluation of care and provides a common language across clinical and research settings. Chiarotto et al. report on international consensus regarding choice of outcome measures for research and practice and outline the basis for these recommendations. The findings are directly and immediately applicable to clinicians and researchers in the field.

## Research in underserved areas

While the burden of back pain in adults is well acknowledged, the same is not true regarding children. Given that previous back pain is a robust predictor of future episodes, improving the understanding of the condition earlier in the life-course may be of value for designing effective prevention and management interventions. Kamper et al. describe the available evidence regarding prevalence, risk, prognosis and treatment effectiveness for back pain in children and adolescents; discuss clinical implications; and identify priorities from both content and methodological perspectives. Despite the presence of evidence that social and cultural factors appear to be influential in the experience of back pain, the bulk of the clinical research in the field is conducted in high-income western countries. To highlight this problem, Henschke et al. review the research that describes how social and cultural influences may operate and discuss the implications of this for the clinical encounter. Numerous studies report the problem of an 'evidence-practice gap' within back pain management: the findings of clinical research and recommendations in guidelines are often not transferred to the patient seeking care. In part, this may be due to a lack of dedicated implementation research in back pain. Hodder et al. review the findings of implementation studies that have been undertaken and critique the methods to set out how this type of research can be best designed and interpreted.

## New directions

Lack of certainty regarding pathological processes presents a significant challenge for clinicians treating patients with back pain. Fortunately, recently developed analytical methods hold some promise in terms of understanding the causal mechanisms responsible for clinical course and treatment effectiveness. Lee et al. set out what the available research tells us about the mechanisms involved in back pain and explain how future research can use these methods to advance understanding further. A key barrier to evidence-based practice is the time needed for clinicians to search, identify and appraise relevant research findings in the context of busy day-to-day practice. With this in mind, researchers and clinicians have begun exploring methods for efficient delivery of evidence-based information to the point of care delivery. Coupe et al. describe the development of a decision-support tool designed for integration into the clinical encounter. The chapter outlines the process and design considerations and explains how such a tool can improve the quality of care. The ubiquity of smart devices has seen an explosion in the area of 'mHealth'; however, assessment and evaluation of newly

developed technologies have lagged well behind. In the final chapter, Machado et al. present a review of smartphone Apps designed for the management of back pain. In addition to assessing and critiquing the Apps that are available and providing recommendations, the chapter provides a model for assessing Apps, which may be applied in other areas.