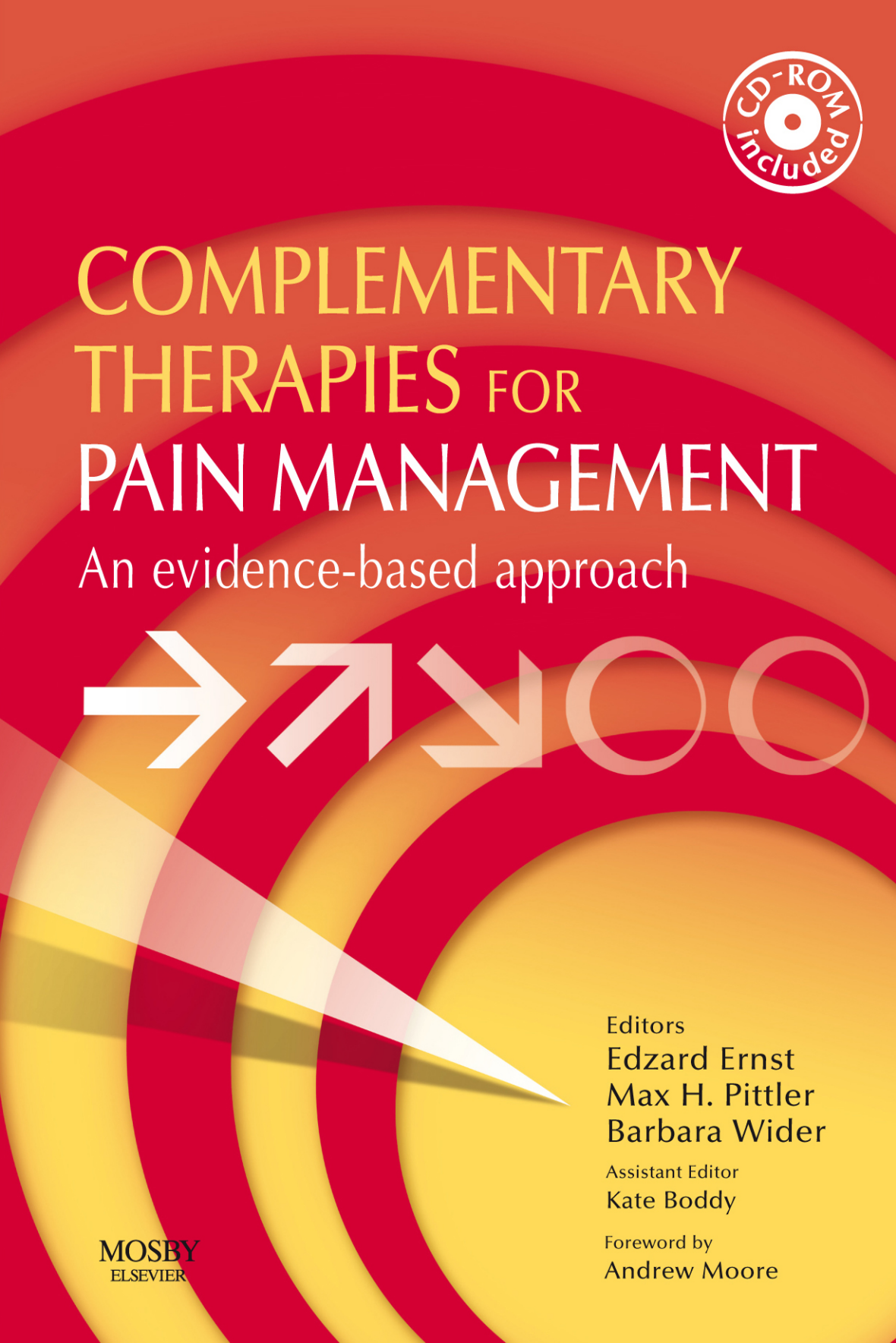

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An evidence-based approach
Editors
Edzard Ernst
Max H. Pittler
Barbara Wider
Assistant Editor
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Complementary Therapies for Pain Management

An Evidence-Based Approach

Editors

Edzard Ernst MD PhD FRCP FRCPEd
Professor of Complementary Medicine, Peninsula Medical School, Universities of Exeter and Plymouth, Exeter, UK

Max H Pittler MD PhD
Senior Research Fellow in Complementary Medicine, Peninsula Medical School, Universities of Exeter and Plymouth, Exeter, UK

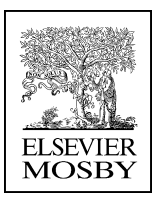
Barbara Wider MA
Research Fellow in Complementary Medicine, Peninsula Medical School, Universities of Exeter and Plymouth, Exeter, UK

Assistant Editor

Kate Boddy MA
Academic Assistant in Complementary Medicine, Peninsula Medical School, Universities of Exeter and Plymouth, Exeter, UK

Foreword by

Andrew Moore
Pain Research Unit, The Churchill, Oxford, UK



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Contributors

Daniel J Benor MD, ABHM
American wholistic psychiatric psychotherapist, Editor of *The International Journal of Healing and Caring* – online, Coordinator of the Council for Healing and Founder of the Doctor-Healer Network – UK and North America, USA

Martien Brands MD, PhD, MFHom
Senior Clinical Lecturer in Homeopathy, Division of Primary Care, School of Population, Community & Behavioural Sciences, University of Liverpool, UK

Luis F Buenaver PhD
Postdoctoral Fellow at the Department of Psychiatry & Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Peter H Canter PhD
Research Fellow, Complementary Medicine, Peninsula Medical School, Universities of Exeter and Plymouth, UK (Chapter Meditation)

Robert R Edwards PhD
Assistant Professor at the Department of Psychiatry & Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Peter Heusser MD, MME
Medical doctor, Master of Medical Education and Professor of Anthroposophic Medicine at the Institute of Complementary Medicine KIKOM at the University of Berne, Switzerland, Head of the Lukas Klinik, an oncological hospital specialising in anthroposophic medicine in Arlesheim, Switzerland

Anita Holdcroft MB, ChB, MD, FRCA
Reader in Anaesthesia and Honorary Consultant Anaesthetist, Imperial College London, and Chelsea and Westminster Hospital, London, UK

Edward K Hui MD
Clinical Instructor, Division of General Internal Medicine and Health Services Research and Center for East–West Medicine, Department of Medicine, David Geffen School of Medicine, University of California at Los Angeles, USA

Ka-Kit Hui MD, FACP
Wallis Annenberg Chair in Integrative East–West Medicine, Professor of Clinical Medicine and Director, Center for East–West Medicine, Department of Medicine, David Geffen School of Medicine, University of California at Los Angeles, USA

CM Janine Leach DO, ND, PhD
Osteopath and naturopath, Senior Research Fellow in Osteopathy at the University of Brighton, Associate Editor of the *International Journal of Osteopathic Medicine*, Member of the National Council for Osteopathic Research, and President of the British Naturopathic Association

Stephen Morley BSc, MPhil, PhD, FBPsS, CPsychol
Professor of Clinical Psychology, Institute of Health Sciences, University of Leeds, UK

Ram Harsh Singh MD(Hons), PhD, DLitt, FNAIM
Visiting Professor, Wonkwang Digital University, Iksan, Republic of Korea; Professor-Head and Dean, Faculty of Ayurveda, Banaras Hindu University, Varanasi, India

Bernhard Uehleke MD, PhD, Dipl Phys, Dipl Kfm, FFPM
Research coordinator of the Department of Naturopathy, Charité Berlin, Campus Benjamin Franklin, Berlin, Germany

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Foreword

The thing about pain is that there is a lot of it about. Most people (lay and professional) think immediately about cancer pain or acute pain, but the stark fact is that these two areas are dwarfed in scope by the amount of chronic non-malignant pain that occurs in the community. A recent, large, European survey[1] found that almost one in five adults had pain of at least moderate intensity, occurring almost every day, and lasting for 6 months or longer. Of course, chronic pain is a bigger problem for older people, with about half of people of retirement age having some chronic pain problem, most often musculoskeletal.[2]

Moreover, this chronic pain in the community is not well treated. In one community survey,[2] at least half of the patients had either high-intensity pain or were limited in their activities of daily living, and British general practitioners (GPs) when asked about treating chronic pain in the community come up with a similar estimate.[3] A survey of over 3000 patients with osteoarthritis showed that the majority suffered interference in the activities of daily living,[4] which makes it understandable why chronic pain conditions have the most negative impact on quality of life of chronic conditions in the community, including cancer and heart disease.[5]

Clinical trials of analgesic interventions for chronic pain often show limited improvement over placebo. For instance, a recent systematic review of interventions in knee osteoarthritis showed that, on average, interventions produced just over 10 mm more pain relief on a 100-mm visual analogue scale than did placebo,[6] while analysis of recent non-steroidal anti-inflammatory drugs (NSAIDs) versus placebo trials in osteoarthritis showed that only 11% more patients had pain relief greater than 10 mm with NSAIDs.[7]

In these circumstances, it is not surprising that many patients seek additional help for their pain outside formal health-care provision. In the European survey, for instance, 40% of patients used over-the-counter analgesics as well as their usual prescribed medicines.[1] In addition, 60% also used some other form of treatment, namely, in descending order, massage, physical therapy, acupuncture, topical analgesics, heat and exercise. A number of other less conventional therapies were used in small numbers of patients.

One obvious retort is to question how well those additional therapies work, because the patients are spending significant amounts of money for this additional care and should be getting value for their money. In the UK, about 20% of the population uses these therapies, spending over £500 million a year. In the USA 40% of the population regularly use some form of complementary therapy, spending £15–20 billion a year between them. There are now more complementary practitioners than GPs in the UK, and some treatments are even delivered on the National Health Service.

Pain is the major driver for all this, and a book that delivers concise evidence-based information is clearly going to be helpful but there are always going to be difficulties, however good authors are. It is worth thinking briefly about a few of the issues.

- To be trustworthy, trials and reviews need to fulfil criteria of quality (to avoid bias), size (to avoid the random play of chance) and validity (we need sensible answers to sensible questions, not just whatever is available). The biggest problem with complementary therapies is that most trials, and most reviews, are deficient in some or all of these areas, and consequently the potential to mislead is large.

- For many therapy/condition combinations, therefore, it is inevitable that the conclusion will be that we do not know with any certainty whether they work. There is an absence of robust evidence from clinical trials, though clearly many practitioners, and some patients, will testify anecdotally to a therapy's success in particular cases.
- Absence of evidence is a major problem, not just for efficacy but especially for harm. Absence of good data relating to harm, from clinical trials or observational studies, means that there are real dangers from rare but serious adverse events. Here, not only is anecdote unhelpful, it is positively misleading, laced, as it inevitably will be, with bias.

How are these difficulties to be overcome? In the short term, they are not. In the short term, we will have to face up to the lack of evidence of efficacy and even evidence of lack of efficacy.

It seems to me that the arguments about complementary therapies, for pain or any other indication, have become stereotyped. They suffocate thought. Rather than argue endlessly about how poorly complementary therapies do in clinical trials, perhaps we should be asking ourselves why it is that mainline interventions appear in such an unflattering light. Perhaps many of the trial designs lack sensitivity, though in general they do appear to mirror, if faintly, clinical practice. Where quality, validity and size are adequate, then clinical trials and clinical practice give the same results, both for efficacy and for harm.

What we need is some original thought, lateral thinking, something from left field (a baseball term that appears to mean something wildly unrelated to the subject being discussed). Less heat, more light. This book, with its impassionate overview of the evidence, might just help to start that process.

Andrew Moore
Oxford, 2006

REFERENCES

1. Breivik H, Collett B, Ventafridda V, Cohen R, Gallacher D. Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment. Eur J Pain 2006;10:287–333
2. Elliott AM, Smith BH, Penny KI, Smith WC, Chambers WA. The epidemiology of chronic pain in the community. Lancet 1999;354:1248–1252
3. Stannard C, Johnson M. Chronic pain management – can we do better? An interview-based survey in primary care. Curr Med Res Opin 2003;19:703–706
4. Crichton B, Green M. GP and patient perspectives on treatment with non-steroidal anti-inflammatory drugs for the treatment of pain in osteoarthritis. Curr Med Res Opin 2002;18:92–96
5. Sprangers MA, de Regt EB, Andries F, van Agt HM, Bijl RV, de Boer JB, Foets M, Hoeymans N, Jacobs AE, Kempen GI, Miedema HS, Tijhuis MA, de Haes HC. Which chronic conditions are associated with better or poorer quality of life? J Clin Epidemiol 2000;53:895–907
6. Bjordal JM, Klovning A, Ljunggren AE, Slordal L. Short-term efficacy of pharmacotherapeutic interventions in osteoarthritic knee pain: a meta-analysis of randomised placebo-controlled trials. Eur J Pain 2006;11:125–138
7. Lakshminarayanan M, Niculescu L, Andrade L, Moore A, Singh G. Influence of age, gender, race, and body mass index on the efficacy of nonsteroidal anti-inflammatory drugs in osteoarthritis trials. APLAR J Rheumatol 2006;9(Suppl. 1):248

Preface

Most pain clinics today have adopted some form of complementary and alternative medicine (CAM).[1,2] The reasons for this move may well be patient demand[3] enhanced by the continuous promotion of CAM by the media.[4] When we, for instance, extracted from seven lay books on CAM the treatments which were promoted for specific pain syndromes we found that a confusing array of therapies were recommended, with little consensus among authors and even less basis in scientific evidence (Table 0.1).[5]

During recent years, CAM has become increasingly evidence-based. Today Medline holds about 4300 controlled clinical trials and the Cochrane database includes 71 systematic reviews of CAM. Recent analyses have shown that these publications are as good as[6] or better than,[7] in terms of methodological quality, studies of conventional treatments. Reviewing the evidence systematically, we found good or encouraging evidence for a range of CAM therapies in the management of pain (Table 0.2). Thus, there is little reason to ignore this evidence.

To find out how CAM is covered in textbooks on pain, electronic searches for books were conducted in the bibliographic databases Global Books in Print and WorldCat. Additional searches were carried out using Amazon and via leading medical publishers' websites. Our aim was to identify all books with 'pain' or 'pain management' in the title that were published in English between January 2004 and November 2005, and were first editions aimed at the academic or medical professional market. Hard copies of all books thus located were obtained and studied. Specifically we determined whether the book in question contained a

Table 0.1 **Data extracted from seven popular lay books on CAM. Figures depict the total number of different CAM therapies recommended for each of the listed conditions in these books**

Pain syndrome	Number of CAM therapies recommended
Arthritis	131
Back pain	65
Chronic pain	29
Dysmenorrhoea	33
Fibromyalgia	7
Headache	78
Labour pain	10
Menorrhagia	31
Migraine	32
Neuralgia	30
Pain	31
Sciatica	55
Sprains and strains	28

Table 0.2 **Examples of CAM therapies for pain supported by good or encouraging evidence***

Modality	Indication
Acupuncture	Various pain syndromes
Chiropractic	Back pain
Chondroitin	Osteoarthritis
Devil's claw (*Harpagophytum procumbens)*	Back pain
Feverfew (*Tanacetum parthenium*)	Prevention of migraine
Glusosamine	Osteoarthritis
Herbal medicines	Various pain syndromes
Hypnotherapy	Various pain syndromes
Massage	Back pain
Osteopathy	Various pain syndromes
Relaxation techniques	Various pain syndromes
Willow (*Salix* spp.)	Osteoarthritis

* Data extracted from Ernst et al.[16] and based on systematic reviews conducted for this book.

dedicated chapter on CAM or on a specific CAM therapy and whether this information was in depth and factually correct.

Our searches identified eight books.[8–15] Table 0.3 gives an overview of the information related to CAM in these books. None of the books completely ignored CAM. Three contained a dedicated chapter on CAM[10,14,15] and two had dedicated chapters on a specific CAM therapy, which was acupuncture in both cases.[9,12] The three books without a dedicated CAM chapter had short sections about CAM in other chapters.[8,11,13] Two of the books provided CAM information that seemed both relatively in depth and correct.[12,14] In other books, we found the information at least partly misleading[9,13] or outdated.[10]

While most modern pain books contain information on CAM, this information usually does not cover the wide range of CAM modalities for which evidence is available (Table 0.2).[5,16] Compared to the total volume of each book, the CAM information was extremely brief. Considering the prevalence of CAM use[3] this might be seen as a significant underrepresentation. The information provided is not always reliable. As many conventional health-care professionals know very little about CAM,[17] the need for more and accurate information is huge.

This book is aimed at filling this gap. It is structured along the lines of, and based on the same principles as, our *Desktop Guide to Complementary and Alternative Medicine*.[5,16] Our aim was to provide evidence-based information on the effectiveness and safety of CAM for conditions that are often associated with pain. The text was written with clinicians, particularly conventional health-care professionals, in mind. It is therefore concise, straightforward and avoids the often flowery language of CAM. As we wanted our book to be valuable not only to pain specialists but to all clinicians, we also included conditions that are not normally seen in pain clinics.

This book deviates from most textbooks in that it contains a methods section where we explain how we have conducted the research underpinning it. We hope that this enhances transparency, objectivity and reproducibility. It is essential that the reader reads both the *Methods* and the *How to use this book* chapters.

Table 0.3 **Information on CAM provided in eight textbooks of pain**

Book	General chapter on CAM?	Chapter on specific modality	Information correct?
Banks[10]	Yes (12 pages)	No, sections within other chapters (massage 5 pages)	Aims to provide 'overview of CAM therapies' yet only selects four modalities: Alexander technique, tai chi, qigong and acupuncture. Extremely brief with little emphasis on clinical evidence, often outdated
Gatchel[11]	No, section within chapter (4 pages)	No	Sensible overview of CAM issues but very little on specific clinical evidence and incomplete
Holdcroft[12]	No	Yes, acupuncture (7 pages)	Yes, in depth information, e.g. on mechanism of action and clinical evidence (but not all relevant CAM topics are covered)
Marcus[13]	No	No, but 3 paragraphs in other chapters	Information on efficacy is misleading: they quote survey data which 'failed to find any benefit' from a range of CAM without presenting any trial evidence, even though such data exist
McCarberg[14]	Yes (23 pages)	No, sections within CAM chapter	Yes, careful discussion of several issues related to CAM; sections dedicated to the value of a range of specific CAM interventions (but not all relevant CAM topics are covered)
Ross[8]	No	No	Only a brief sentence to cover CAM in chapter 'Acute pain management': 'Alternative medicine treatments, such as acupuncture and chiropractic care, can also be used. These treatments provide extremely effective analgesia but should be used for short periods only.'
Stannard[9]	No	Yes, acupuncture (1.5 pages)	Not always: 'There are few double-blind randomised controlled trials … but uncontrolled series and comparisons … suggest … .' (In fact there are in excess of 100 trials of acupuncture for pain control)
Wallace[15]	Yes (4.5 pages)	No	Yes, but incomplete and extremely brief

We are confident that our book fills glaring omissions in the pain literature. It will guide clinicians by summarising the facts and pointing them to treatments which demonstrably do more good than harm and steering them away from other options which fail to fulfil this elementary criterion.

Edzard Ernst, Max H Pittler, Barbara Wider, Kate Boddy
Exeter, 2006

REFERENCES

1. Orpen M, Harvey G, Millard J. A survey of the use of self-acupuncture in pain clinics – a safe way to meet increasing demand? Acupunct Med 2004;22:137–140
2. Burden B, Herron-Marx S, Clifford C. The increasing use of reiki as a complementary therapy in specialist palliative care. Int J Palliat Nurs 2005;11:248–253
3. Barnes PM, Powell-Griner E, McFann K, Nahin RL. Complementary and alternative medicine use among adults: United States, 2002. Adv Data 2004;343:1–19
4. Ernst E, Weihmayr T. UK and German media differ over complementary medicine. BMJ 2000;321:707
5. Ernst E, Pittler MH, Stevinson C, White AR. The desktop guide to complementary and alternative medicine. Edinburgh; Mosby; 2001
6. Klassen TP, Pham B, Lawson ML, Moher D. For randomized controlled trials, the quality of reports of complementary and alternative medicine was as good as reports of conventional medicine. J Clin Epidemiol 2005;58:763–768
7. Lawson ML, Pham B, Klassen TP, Moher D. Systematic reviews involving complementary and alternative medicine interventions had higher quality of reporting than conventional medicine reviews. J Clin Epidemiol 2005;58:777–784
8. Ross E. Pain management. Philadelphia, PA: Hanley & Belfus; 2004
9. Stannard C, Booth S. Pain. Edinburgh: Churchill Livingstone; 2004
10. Banks C, Mackrodt T. Chronic pain management. London: Whurr; 2005
11. Gatchel R. Clinical essentials of pain management. Philadelphia, PA: American College of Physicians, 2005
12. Holdcroft A, Jaggar S. Core topics in pain. Cambridge: Cambridge University Press, 2005
13. Marcus DA. Chronic pain: a primary care guide to practical management. Totowa, NJ: Humana Press; 2005
14. McCarberg B, Passik SD. Expert guide to pain management. Philadelphia, PA: American College of Physicians; 2005
15. Wallace MS, Staats PS. Pain medicine and management; just the facts. New York: McGraw-Hill; 2005
16. Ernst E, Pittler MH, Wider B, Boddy K. The desktop guide to complementary and alternative medicine, 2nd edn. Edinburgh; Mosby; 2006
17. Botting DA, Cook R. Complementary medicine: knowledge, use and attitudes of doctors. Complement Ther Nurs Midwifery 2000;6:41–47

Glossary

DEFINITIONS OF GENERAL TERMS

Cochrane review Cochrane reviews are systematic summaries of evidence of the effects of healthcare interventions prepared and maintained by the Cochrane Collaboration. The reviews employ specific methods, are prepared using REVIEW MANAGER (REVMAN) software, adhere to a structured format and are regularly updated (http://www.cochrane.org).

Confidence interval (CI) Quantifies the uncertainty in measurement. Usually reported as 95% CI, which is the range of values within which one can expect to find the true value in 95% of cases.

Controlled clinical trial (CCT) Control is a standard against which experimental observations may be evaluated. In clinical trials, one group of participants is given an experimental intervention, while another group (i.e. the control group) is given either a standard treatment for the disease, a placebo or no treatment at all.

Cross-over Participants in the intervention group receive the control treatment upon completion of the treatment cycle. Similarly those in the control group 'cross over' and receive the experimental intervention.

Double-blind trial A clinical trial design in which neither the participating individuals nor the study staff know which participants are receiving the experimental treatment and which are receiving the control treatment or placebo. Double-blind trials are thought to produce objective results, because the expectations of the participant and study staff about the experimental drug do not affect the outcome.

Meta-analysis A quantitative statistical method to pool trial data in a single estimate; can be part of a systematic review.

***P*-value** Probability that an observed difference between groups occurred by chance alone. A result is conventionally regarded as 'statistically significant' if the likelihood that it is the result of chance alone is less than five times out of 100 ($P < 0.05$).

Randomisation The process by which patients in a clinical trial are randomly assigned to experimental intervention or control treatment. Randomisation minimises the differences among groups by equally distributing participants with particular characteristics (known or unknown) among all the trial arms.

Randomised clinical trial (RCT) Study where participants are randomly allocated to receive experimental or control treatment.

Systematic review Review in which literature from multiple sources is systematically searched for, assessed and evaluated to answer clearly formulated questions.

ABBREVIATIONS OF FREQUENTLY USED TERMS

The following abbreviations are used throughout this book:

CAM	complementary and alternative medicine
CCT	controlled clinical trial
CI	confidence intervals (95% unless otherwise stated)
RCT	randomised clinical trial
g	gram(s)
mg	milligram(s)

μg	micrograms
h	hour(s)
m	metre(s)

DEFINITIONS OF PAIN TERMS

Analgesia Absence of pain in response to stimulus that is normally painful.

Anaesthesia Absence of all sensory modalities.

Central pain Regional pain caused by a primary lesion or dysfunction in the central nervous system, usually associated with abnormal sensitivity to temperature and to noxious stimulation.

Complex regional pain syndrome (CRPS) A term describing a variety of painful conditions following injury that appear regionally, have a distal predominance of abnormal findings, exceed in both magnitude and duration the expected clinical course of the inciting event, often result in significant impairment of motor function, and show variable progression over time. CRPS is a new term for disorders previously called reflex sympathetic dystrophy (RSD).

CRPS I (RSD)

- Type I is a syndrome that develops after an initiating noxious event.
- Spontaneous pain or allodynia/hyperalgesia occurs, is not limited to the territory of a single peripheral nerve, and is disproportionate to the inciting event.
- There is or has been evidence of oedema, skin blood flow abnormality or abnormal sudomotor activity in the region of the pain since the inciting event.
- This diagnosis is excluded by the existence of conditions that would otherwise account for the degree of pain and dysfunction.

CRPS II (causalgia)

- Type II is a syndrome that develops after a nerve injury. Spontaneous pain or allodynia/hyperalgesia occurs and is not necessarily limited to the territory of the injured nerve.
- There is or has been evidence of oedema, skin blood flow abnormality or abnormal sudomotor activity in the region of the pain since the inciting event.
- This diagnosis is excluded by the existence of conditions that would otherwise account for the degree of pain and dysfunction.

Chronic pain Pain that persists beyond the course of an acute disease or a reasonable time for an injury to heal or that is associated with a chronic pathological process that causes continuous pain, or the pain recurs at intervals of months or years. Some investigators use a pain duration of $\geqslant$6 months to designate a pain as chronic.

Deafferentation pain Pain as the result of a loss of sensory input into the central nervous system. This may occur with lesions of peripheral nerves, such as avulsion of the brachial plexus, or through pathology of the central nervous system.

Dysaesthesia An unpleasant abnormal sensation, whether spontaneous or evoked.

Hyperalgesia An increased response to a stimulus that is normally painful.

Hyperaesthesia Increased sensitivity to stimulation; this excludes the special senses.

Hyperpathia A painful syndrome, characterised by increased reaction to a stimulus, especially a repetitive stimulus, as well as increased threshold.

Hypoalgesia Diminished sensitivity to noxious stimulation.

Hypoaesthesia Diminished sensitivity to stimulation; this excludes the special senses.

Ischaemic pain Pain caused by oxygen starvation of tissues; if the oxygen supply is not restored, cell death (necrosis) will ensue.

Neuritis Inflammation of a nerve or nerves. (Not to be used unless inflammation is thought to be present.)

Neurogenic pain Pain initiated or caused by a primary lesion, dysfunction or transitory perturbation in the peripheral or central nervous system.

Nociceptive pain Pain caused by activation of nociceptive afferent fibres. This type of pain satisfies the criteria for pain transmission, i.e. transmission to the spinal cord, thalamus and then to the cerebral cortex.

Nociceptor A receptor preferentially sensitive to a noxious stimulus or to a stimulus that would become noxious if prolonged.

Noxious stimulus A stimulus that is actually or potentially damaging to body tissue.

Pain An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of damage.

Pain threshold The least experience of pain that a subject can recognise.

Pain tolerance level The greatest level of pain that a subject is prepared to tolerate.

Pain of psychological origin

Delusional or *hallucinatory*: pain of psychological origin and attributed by the patient to a specific delusional cause.

Hysterical, conversion or *hypochondriacal*: pain specifically attributable to the thought process, emotional state, or personality of the patient in the absence of an organic or delusional cause or tension mechanism.

Paraesthesia An abnormal sensation, whether spontaneous or evoked. **NB** Paraesthesia is an abnormal sensation that is not unpleasant while dysaesthesia is an abnormal sensation that is considered unpleasant. Dysaesthesia does not include all abnormal sensations, but only those that are unpleasant.

Radicular pain Pain perceived as arising in a limb or the trunk wall caused by ectopic activation of nociceptive afferent fibres in a spinal nerve or its roots or other neuropathic mechanisms. The pain is usually lancinating and travels in a narrow band. Aetiological causes include anatomic lesions affecting the spinal nerve and dorsal root ganglion including herniated intervertebral disc and spinal stenosis.

Radiculopathy Objective loss of sensory and/or motor function as a result of a conduction block in the axons of a spinal nerve or its roots. Symptoms include numbness and weakness in the distribution of the affected nerve. Neurological examination and diagnostic tests confirm the neurological abnormality. **NB** Radicular pain and radiculopathy are not synonymous. The former is a symptom caused by ectopic impulse generation. The latter relates to objective neurological signs as a result of a conduction block. The two conditions may coexist and may be caused by the same lesion.

Referred pain Pain perceived as occurring in a region of the body topographically distinct from the region in which the actual source of pain is located.

Somatic Derived from the Greek word for 'body'. Although somatosensory input refers to sensory signals from all tissues of the body including skin, viscera, muscles and joints, it usually signifies input from body tissue other than the viscera.

Visceral pain Pain carried by the sympathetic fibres: this pain is diffuse and poorly localised.

SOURCE

Raja SN, Molloy RE, Liu S, Fishman SM, Benzon HT. Essentials of pain medicine and regional anesthesia. Edinburgh: Churchill Livingstone; 2004

PATIENTS' LANGUAGE OF PAIN

Ache A usually dull persistent pain; to become distressed or disturbed (as with anxiety or regret).
Origin: from Old English *acan* 'to ache, suffer pain', perhaps imitative of groaning.

Afflict Cause pain or suffering to.
Origin: from Latin *afflictare* 'knock about, harass', or *affligere* 'knock down, weaken'.

Aggrieve To give pain or trouble to; to inflict injury on.
Origin: from Old French *agrever* 'bear heavily on', from Latin *aggravare* 'make heavier'.

Agony Extreme suffering; intense pain of mind or body; the struggle that precedes death.
Origin: 'mental suffering' (especially that of Christ in the Garden of Gethsemane), from Greek *agonia* 'a (mental) struggle for victory', originally 'a struggle for victory in the games', from *agon* 'assembly for a contest'.

Anguish Severe mental or physical pain or suffering.
Origin: from Old French *anguisse* 'choking sensation', from Latin *angustia* 'tightness, distress', from *ang(u)ere* 'to throttle, torment'.

Anxious Experiencing worry or unease.
Origin: from Latin *anxius* 'solicitous, uneasy, troubled in mind', from *ang(u)ere* 'choke, cause distress'.

Awe Dread mixed with veneration; feeling of great respect mixed with fear.
Origin: from Old Norse *agi* 'fright', current sense is through its biblical use with reference to the Supreme Being.

Chagrin Disquietude or distress of mind caused by humiliation, disappointment or failure.
Origin: from French *chagrin* 'sad, melancholy', possibly from Old North French *graignier* 'to sorrow'.

Discomfort Slight pain; slight anxiety or embarrassment; cause discomfort to.
Origin: from Old French *desconfort*, originally 'to deprive of courage'.

Disquiet A feeling of anxiety; make anxious.
Origin: Quiet is from Old French *quiete*, from Latin *quies* 'rest, quiet'.

Distress Extreme anxiety or suffering; a state of physical strain, especially difficulty in breathing; cause distress to.
Origin: from Old French *destresce*, from Latin *distringere* 'draw apart, hinder'.

Dolor A state of great sorrow or distress.
Origin: from Latin *dolor* 'pain, grief '.

Excruciate To inflict intense pain on; to subject to intense mental distress.
Origin: from Latin *excruciates* 'to torture, torment', from *ex-* 'out, thoroughly' and *cruciare* 'cause pain or anguish to, to crucify', from *cruc-*, *crux* 'cross'.

Grief/grieve Intense sorrow, especially caused by someone's death; trouble or annoyance.
Origin: from Old French *grever* 'to burden'.

Gripe Express a trivial complaint, grumble; affect with stomach or intestinal pain.
Origin: from Old English, 'grasp, clutch', related to grip and grope.

Hurt Cause or feel physical pain or injury; cause or feel mental pain or distress; injury or pain, harm.
Origin: from Old French *hurter* 'to strike'.

Misery A state of suffering and want that is the result of poverty or affliction; a circumstance, thing or place that causes suffering or discomfort; a state of great unhappiness and emotional distress.
Origin: from Old French *miserie*, from Latin *miseria* 'wretchedness', from *miser* meaning 'bodily pain' from 1825, American English.

Pang A sudden sharp pain or painful emotion.
Origin: unknown, perhaps related to prong 'pointed tool'.

Smart Give a sharp, stinging pain; feel upset and annoyed.
Origin: from Old English *smeortan* 'be painful', from West Germanic *smert-*, German *schmerzen* 'to pain', originally 'to bite', Latin *mordere* 'to bite'.

Sore Painful or aching; suffering pain; upset and angry; a raw or painful place on the body; a source of distress or annoyance.
Origin: from Old English *sar* 'painful, grievous, aching', influenced in meaning by Old Norse *sarr* 'sore, wounded'.

Sting A small sharp-pointed organ of an insect, capable of inflicting a painful wound by injecting poison; a wound from a sting; a sharp tingling sensation or hurtful effect; to wound with a sting; produce a stinging sensation; hurt, upset.

Origin: from Old English *stingan* 'to prick with a small point' (of weapons, insects, plants, etc.).

Stitch A sudden sharp pain in the side of the body, caused by strenuous exercise.
Origin: from Old English *stice* 'a prick, puncture', from the root of stick; the sense of 'sudden, stabbing pain in the side' was used in late Old English.

Suffer Experience or be subjected to something bad or unpleasant; be affected by or subject to an illness or ailment.
Origin: from Latin *sufferre*, from *ferre* 'to bear'.

Throe Pang, spasm; pain of childbirth, agony of death; a hard or painful struggle.
Origin: from Middle English *thrawe, throwe* 'pain, pang of childbirth, agony of death', possibly from Old English *thrawan* 'twist, turn, writhe', or altered from Old English *threa* 'affliction, pang, evil, threat'.

Torment Severe physical or mental suffering.
Origin: 'inflicting of torture', also 'state of great suffering', from Old French *tourment*, Latin *tormentum* 'instrument of torture', from *torquere* 'to twist'.

Torture The infliction of severe pain as a punishment or a forcible means of persuasion; great suffering or anxiety.
Origin: from Middle French *torture* 'infliction of great pain, great pain, agony', Latin *tortura* 'twisting, writhing, torture, torment', from *torquere* 'to twist'.

Trouble Cause distress, pain or inconvenience to; showing or experiencing problems or anxiety.
Origin: from Old French *truble*, from Latin *turba* 'crowd, disturbance'.

Twinge A sudden, sharp localised pain; a brief, sharp pang of emotion.
Origin: from obsolete verb twinge 'to pinch, tweak', from Old English *twengan* 'to pinch,' of uncertain origin.

Unease Mental or spiritual discomfort.
Origin: ease is from Old French *aise* 'comfort, pleasure' of unknown origin; the earliest senses in French appear to be 'elbow-room' and 'opportunity'.

Vex To bring trouble, distress or agitation to; make annoyed or worried.
Origin: from Middle French *vexer*, from Latin *vexare* 'to shake, disturb'.

Woe Used to express grief, regret or distress.
Origin: from Middle English *wa*, *wo*, from Old English *wa*; akin to Old Norse *vei* 'interjection, woe', Latin *vae*.

Wretchedness Deeply afflicted, dejected or distressed in body or mind; extremely or deplorably bad or distressing.
Origin: from Old English *wrecca* 'outcast, exile'; akin to Old High German *hrechjo* 'fugitive'.

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SECTION 1

Using the book

THE BOOK AT A GLANCE

- The purpose of *Complementary Therapies for Pain Management* is to present relevant, reliable, thorough and up-to-date information on complementary and alternative medicine in a clear concise format with a focus on clinical evidence relating to various forms of pain.
- The clinical evidence was retrieved through systematic searches in six general and specialist literature databases carried out up to March 2006 (see *Methods* p. 3).
- Studies were selected according to the following priority order: systematic reviews and meta-analyses, randomised clinical trials, controlled clinical trials, uncontrolled trials (see *Methods* p. 3).
- Assessment of trials was a combination of the methodological quality of the body of evidence, the level of evidence and the volume of evidence resulting in an indication of the weight of the evidence (low O to high OOO) and the direction of the evidence (clearly positive ↑ to clearly negative ↓) (see *How to use this book* pp. 13–14).
- Key information and an application of judgement are presented in the *Risk–benefit assessments* (Sections 3 and 4), in the *Overall recommendation* (Section 5), and in the *Summary of evidence* tables (see *How to use this book* p. 5).
- Absence of evidence of effectiveness does not imply absence of effectiveness.
- For safety issues the precautionary principle has been applied, so a treatment is not considered risk-free unless evidence suggests otherwise. A simple Yes/No descriptor alerts the reader in a general way to the existence (however rare) of potentially serious safety concerns (see *Methods* p. 4).
- Pregnancy and lactation are cited as contraindications for all medicines included in this book unless there is positive evidence of safety in these situations (see *Methods* p. 4).

METHODS

The intention of this book is to provide relevant, reliable, thorough and up-to-date information in a clear, concise format. To achieve this, a systematic approach was used to locate, select, appraise and present information. The concept and format of the book are based on our highly acclaimed *Desktop Guide to Complementary and Alternative Medicine*.[1] This chapter describes the procedures followed.

DEFINITION OF COMPLEMENTARY AND ALTERNATIVE MEDICINE

For the purposes of this book complementary and alternative medicine (CAM) was defined as 'diagnosis, treatment and/or prevention which complements mainstream medicine by contributing to a common whole, satisfying a demand not met by orthodoxy, or diversifying the conceptual framework of medicine'.[2] What constitutes CAM may vary according to national differences and individual viewpoints. The list below indicates many of the treatments that we considered mainstream rather than CAM and that were therefore not generally covered in this book. However, some of these treatments are mentioned in Section 5 (Pain syndromes) for particular non-mainstream indications.

- Behavioural therapy
- Cognitive therapy
- Counselling
- Diets and nutritional advice
- Electromagnetic therapy

- Electrotherapy
- Exercise
- Lifestyle approaches
- Low-dose laser therapy
- Transcranial magnetic stimulation
- Transcutaneous electrical nerve stimulation (TENS)
- Ultrasound
- Vitamins and minerals.

SELECTION OF TOPICS

Sections 3 and 4 cover CAM treatments (therapies and medicines) that are popular with pain patients. Treatments for which evidence relating to effectiveness is available are the subject of individual chapters. Other treatments where there is only some evidence of effectiveness are covered in tables.

The pain syndromes included in Section 5 are those that are commonly seen by clinicians, that are frequently treated with CAM and for which the most evidence relating to effectiveness is available. Conditions for which insufficient evidence is available (for instance phantom pain) are not normally covered in separate chapters.

Provisional lists of potential topics for chapters and tables were produced during discussion and amended after inspecting the results of literature searches (see *Literature searches* below) and internal review (see *Review process* below).

SOURCES AND REFERENCING

A number of sources were used to compile information for this book. These included reference books, our own files, contact with other experts, and systematic literature searches (see *Literature searches* below). Since a considerable amount of information is compressed into each chapter it was decided to keep referencing to a minimum. Comprehensive referencing would involve lengthy and repetitive reference lists, which would distract the reader from quick access to clear information. For example, the information on risks presented in Sections 3 and 4 is largely based on a vast number of case reports and individual referencing would have been more of a hindrance than a help to the reader. Therefore, a bibliography of the main reference sources for the book is provided at the end of this section. The exception to this is information relating to clinical evidence, which provides the major focus of this book. In Sections 3, 4 and 5 key references are provided for the evidence cited at the end of each chapter, to allow the interested reader to trace the source.

LITERATURE SEARCHES FOR CLINICAL EVIDENCE

Systematic searches were carried out in the databases Medline, Embase, Amed, Scopus, the Cochrane Database of Systematic Reviews, Natural Standard and the Natural Medicines Comprehensive Database. Each database was searched from its respective inception until March 2006. The search strategy used to locate relevant literature was developed and refined. In addition, our own files, the bibliographies of relevant papers and the contents pages of all issues of the review journal *FACT* (*Focus on Alternative and Complementary Therapies*; London: Pharmaceutical Press, www.pharmpress.com/fact) were searched for further studies. No language restrictions were imposed. Studies in languages other than English were translated in-house.

SELECTION OF CLINICAL EVIDENCE

Each author selected relevant studies on a particular topic by scrutinising the abstracts. Systematic reviews and meta-analyses of clinical trials were given priority and copies of originals were obtained. Where systematic reviews or meta-analyses were not located, the evidence

from randomised clinical trials and controlled clinical trials was considered next. In their absence, uncontrolled studies were considered. In most cases, original reports were obtained.

APPRAISAL OF CLINICAL EVIDENCE

All authors were familiar with critical appraisal and systematic reviews. They consistently evaluated the methodological quality of the studies by assessing important criteria such as randomisation, blinding and description of withdrawals and dropouts in an informal review process. For systematic reviews and meta-analyses, the assessment of the methodological quality of included trials by the original authors was accepted. The quality of the review itself was assessed informally. In the *Summary of clinical evidence* tables (Section 5), the methodological quality of the body of evidence of a particular treatment for a particular condition was combined with the level of the evidence and the volume of the evidence to produce a measure of 'weight'. This is intended to indicate the degree of confidence that can be placed on the evidence. Details are given in *How to use this book* (see pp. 13–14).

APPLICATION OF JUDGEMENT

Clinical judgement was used by the authors in two specific areas: the *Risk–benefit assessment* of each treatment (Sections 3 and 4) and the *Overall recommendation* (Section 5). These judgements are based on experience and current medical practice as well as on the evidence. In an attempt to minimise bias and achieve standardisation, the process was subjected to internal and external review (see *Review process* below). It should be noted that stating that there is a lack of compelling evidence for a treatment does not imply that the treatment is ineffective.

PRESENTATION OF INFORMATION

In most parts of each chapter, the information is presented in a concise narrative form in a predefined format (see *How to use this book*, pp. 6–13). However, for *Clinical evidence* in Section 5, key information is displayed in the *Summary of evidence* tables. Additionally, the most authoritative systematic review or meta-analysis on a subject has been abstracted into a box. Selected clinical trials are sometimes presented in standardised tables; usually these are the most scientifically rigorous or clinically relevant. Data have been extracted according to predefined criteria into tables, which also provide additional information or a critical comment. Treatments and pain syndromes that are not covered in separate chapters within Sections 3, 4 and 5 can be found in the tables at the end of the respective sections. At the end of Sections 3 and 4, tables are presented containing brief information on other treatments for which some evidence of effectiveness is available or which are used frequently but were not included as full chapters. The table at the end of Section 5 lists other frequently used treatments for specific conditions lacking sound evidence and pain syndromes for which no sufficient evidence is available.

INFORMATION ON SAFETY

Information on safety is central to the assessment of a treatment's value. Hence this material is an important component of the book. Unfortunately, there is often only fragmentary knowledge on safety in CAM. The treatment chapters (Sections 3 and 4) address risks as fully as is possible from the available data. In general, the precautionary principle has been applied, so a treatment is not considered risk-free unless evidence suggests otherwise. In our view, this is prudent and follows the most important axiom of medicine: *primum nihil nocere* – first do no harm. Unless there is positive evidence for safety, pregnancy and lactation are cited as contraindications for all medicines included in this book. Allergic reactions have been mentioned

where they have been reported but should be assumed possible for all herbs and many supplements, with the potential to be serious. Mind–body medicines carry the risk of aggravating or causing psychosis in predisposed individuals.

For the *Summary of clinical evidence* tables in Section 5, many different ways of summarising safety data were considered but it proved impossible to provide sufficient useful detail. It was therefore decided to use a simple Yes/No descriptor to alert the reader in a general way to the existence (however rare) of potentially serious safety concerns, cross-referencing to the sections providing specific details (see *How to use this book*, p. 13). Even when a treatment is apparently innocuous, the table entry is 'Yes' if there is insufficient information available to establish safety and serious risks are considered possible. This applies to all herbs and some supplements. Other supplements are marked 'Yes' because overdose is associated with serious consequences. Most products derived from natural sources carry the risk of allergic reactions (see above). In the case of homeopathic remedies, this is unlikely at non-material dilutions, hence homeopathy is marked 'No'. Aromatherapy, on the other hand, is marked 'Yes' because of the allergic reactions that are possible with essential oils. Therapies marked 'Yes' that cannot be cross-referenced to a specific chapter or table are hydrotherapy (for which cardiorespiratory decompensation and bacterial infections have been reported), exercise (where sudden death has been recorded), electrotherapy (for which psychological disturbance and local injury from electrodes are possible) and fasting and particular diets (where malnutrition can occur). Our intention is not to be alarmist, but clearly the priority must be to minimise all possible risks for the patient.

REVIEW PROCESS

All information presented in this book was subjected to an internal review by all four editors. Chapters were revised accordingly and additional information was incorporated. Regular consensus conferences were held to ensure a standardised approach. This was performed particularly with a view to minimising bias in areas where a degree of personal judgement was introduced (see *Application of judgement* above). Any disputes that appeared during the consensus conferences were resolved through discussion.

As the book is based on the format and style of the *Desktop Guide to Complementary and Alternative Medicine*,[1] criticism and praise from book reviews, the professional organisations of complementary therapies and any other feedback received on the *Desktop Guide* were collated, internally discussed and, where appropriate, applied to *Complementary Therapies for Pain Management*. The ultimate review, however, remains with you, the reader.

REFERENCES

1. Ernst E, Pittler MH, Wider B, Boddy K. The desktop guide to complementary and alternative medicine, 2nd edn. Edinburgh: Mosby; 2006
2. Ernst E, Resch KL, Mills S, Hill R, Mitchell A, Willoughby M, White A. Complementary medicine – a definition. Br J Gen Pract 1995;309:107–111

HOW TO USE THIS BOOK

This book is divided into four main sections:

- general topics
- therapies
- herbal and non-herbal medicines
- pain syndromes.

The first of these sections covers general topics such as epidemiology of pain, pain measurement and a general introduction to CAM. For the chapters presenting different concepts of pain, we have invited experts in these fields to write about how pain is viewed according to the principles of their respective CAM system or therapies. They are intended to contrast with the current medical and psychological concepts of pain and represent the views of the respective chapter authors.

For the chapters within the sections on *Therapies*, *Herbal and non-herbal medicines* and *Pain syndromes*, standardised structures have been adopted. To help the reader understand and make the best use of the information in the individual chapters, brief explanations of the material provided under each subheading are given below, with the help of examples taken from the book.

For further details on the methods employed for writing these sections, see p. 2.

SECTION 3 THERAPIES

This section includes chapters on forms of CAM that are identified as therapeutic modalities and excludes medicines such as herbs or food supplements. Chapters are presented in alphabetical order and are subdivided according to the headings shown in the example below (aromatherapy).

TABLE

Other therapies for which some evidence of effectiveness is available or which are used frequently but were not included as full chapters are presented in a table at the end of this section. Brief information is provided for each one, including a description, its main uses and any concerns about its safety.

AROMATHERAPY

DEFINITION
The controlled use of plant essences for therapeutic purposes.

RELATED TECHNIQUES
Massage.

BACKGROUND
The medicinal use of plant oils has a long history in ancient Egypt, China and India. The development of modern aromatherapy is attributed to the French chemist René Gattefosse, who burned his hand while working in a perfume laboratory and immediately doused it in some nearby lavender oil. The burn healed quickly without scarring, leading him to study the potential curative powers of plant oils. He coined the term aromatherapy in 1937.

TRADITIONAL CONCEPTS
Essential oils can be applied directly to the skin through massage or a compress, added to baths, inhaled with steaming water or spread throughout a room with a diffuser. The oils are believed to have effects at the psychological, physiological and cellular levels. These effects are claimed to be relaxing or stimulating depending on the chemistry of the oil and the previous associations of the individual with a particular scent.

SCIENTIFIC RATIONALE
The scent from the oil activates the olfactory sense. This triggers the limbic system, which governs emotional responses and is involved with the formation and retrieval of learned memories. Essential oils are also absorbed through the skin. Laboratory studies suggest that molecules of the oil can affect organ function, although the clinical relevance of these findings is not clear.

PRACTITIONERS
In most countries aromatherapy is largely unregulated. In the UK it is currently in the process of becoming regulated. Various associations offer courses with the number of hours of training required ranging from 180 to 500. Many nurses and other health-care professionals seek aromatherapy qualifications.

CONDITIONS FREQUENTLY TREATED
Headaches, musculoskeletal pain, insomnia, anxiety and other conditions. Some therapists recommend regular aromatherapy as a means of maintaining general health and well-being. A US survey suggests that stress, musculoskeletal problems and pain are the most common conditions treated by aromatherapists.[1]

TYPICAL SESSION
During an initial session the aromatherapist takes the client's medical history and asks which aromas are liked or disliked. The therapist then selects essential oils deemed appropriate for the client. Treatment usually consists of an aromatherapy massage and advice may be given about home treatments involving the use of oils in baths or a diffuser. The initial session may last up to 2 hours. Subsequent sessions would typically last 1 hour.

COURSE OF TREATMENT
For chronic conditions, one weekly session would be recommended for several weeks, with fortnightly or monthly follow-ups.

CLINICAL EVIDENCE
A Cochrane review focused on aromatherapy and massage for symptom relief in patients with cancer. It included 10 RCTs and found that 'massage and aromatherapy confer short-term benefits on psychological well-being, with the effect on anxiety supported by limited evidence'.[2] A systematic review of CAM for labour pain found one RCT of aromatherapy; its results did not demonstrate that baths with essential oil of ginger or lemongrass reduced analgesic consumption.[3] Other RCTs fail to show benefit in terms of symptom control in cancer patients,[4] or pain control, anxiety or quality of life in hospice patients.[5] More recent controlled clinical trials (CCTs) or RCTs suggest that aromatherapy can reduce the pain of arthritis.[6] An RCT tested whether the mere olfactory absorption of lavender or rosemary essential oils affected pain sensitivity in healthy volunteers ($n = 26$); no such effect was demonstrated.[7]

Other forms of treatment that share important features with the therapy

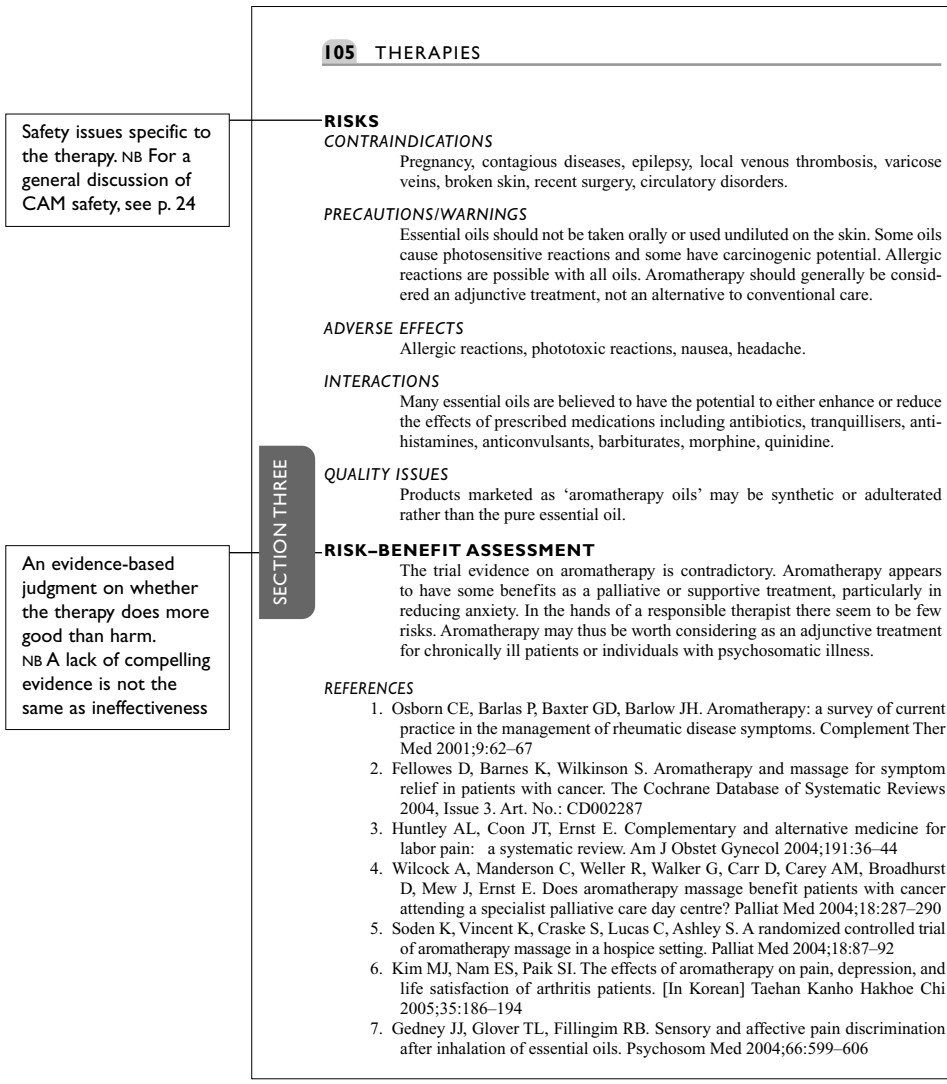
Brief introduction to the origins of the therapy, its cultural context and historical development

Summary of the underlying principles of the therapy.
NB Not all practitioners use the traditional concepts

Evaluation of the principles of the therapy and mechanism of action from a scientific perspective

Persons employing the therapy. Patients should ensure that any therapist used is a member of a recognised body or association, holds professional liability insurance cover and that the recognised body has a code of ethics and conduct and a complaints and disciplinary procedure.
NB Many therapies are practised by more than one professional group

Evidence-based summary of the data relating to the effectiveness of the therapy. In cases where a considerable amount of evidence exists, only the most important is presented. Priority is given to systematic reviews/meta-analyses and RCTs



SECTION 4 HERBAL AND NON-HERBAL MEDICINE

This section includes chapters on forms of CAM that are considered medications such as herbal and non-herbal supplements. Vitamins and minerals are not included (see p. 2). Chapters are presented in alphabetical order according to the common name and are subdivided according to the headings in the example below (comfrey). It was decided to use the common name of herbs because of the frequent uncertainties of terminology in the original articles. Exact taxonomic names is an area that requires attention in future studies.

TABLE

Other herbs and non-herbal supplements for which some evidence of effectiveness is available or which are used frequently but were not included as full chapters are presented in a table at the end of this section. Brief information is provided, including a description, main uses and safety concerns.

COMFREY (*Symphytum officinale*)

Plant taxonomy according to Germplasm Resources Information Network (GRIN) (see p. 16)

SOURCE
Leaf, rhizome, root.

In alphabetical order

MAIN CONSTITUENTS
Allantoin, derivatives of rosmarinic acids, saponins, tannins.

BACKGROUND
Comfrey is a perennial herb of the Boraginaceae family and is native to Europe and Asia. Its name is derived from the Latin word for 'grow together'. Comfrey has been cultivated since about 400 BCE as a medicinal herb for wound healing and broken bones and to stop bleeding. There are concerns about its toxicity, caused by pyrrolizidine alkaloids, so it is recommended for external use only.

For herb: brief description of historical background, etymology and botany. For supplement: rationale for its use

EXAMPLES OF TRADITIONAL USES
Angina, bloody urine, bronchitis, cancer, diarrhoea, excessive menstrual flow, gum disease, persistent cough, pharyngitis, pleuritis, rheumatism and ulcers.

Conditions and purposes for which the medicine was traditionally used in alphabetical order. NB May be unsupported or even contraindicated by current evidence

PHARMACOLOGICAL ACTION
Analgesic, anti-inflammatory, anti-oedematous, wound healing.

CONDITIONS FREQUENTLY TREATED
Bruises and sprains, fractures, ulcers and wounds.

Pharmacologic effects demonstrated. NB Mention is made of mechanisms only if considered relevant

In alphabetical order

CLINICAL EVIDENCE
Topically applied comfrey in the treatment of ankle distortions was tested in several RCTs. One single-blind RCT (n = 164) found comfrey ointment to be non-inferior to diclofenac with regards the pain reaction to pressure on the injured area, swelling and pain at rest and at movement.[1] The same comfrey ointment was found to be superior to placebo in a double-blind RCT (n = 142) in reducing pain, ankle oedema and in increasing ankle mobility.[2] Two different concentrations of comfrey were compared in a double-blind RCT (n = 104), which found the higher concentration to be far more effective than the lower one at decreasing pain and improving functional impairment.[3] One double-blind RCT compared two concentrations of a topical comfrey product with placebo in the treatment of myalgia patients and found better overall efficacy and faster onset of effects with the high-concentration product on pain in the lower and upper back.[4]

Evidence-based summary of the data relating to the effectiveness of the medicine. In cases where a considerable amount of evidence exists, only the most important is presented. Priority is given to systematic reviews/meta-analyses and RCTs

DOSAGE
Ointments and other external preparations are commonly made with 5–20% of comfrey.

Usual therapeutic dose, where possible based on clinical trial data. NB Due to scarce data, no attempt is made to suggest optimum duration of treatment. The effects of some herbs may take several weeks to appear. There is generally a lack of adequate data regarding long-term use

Safety issues specific to the medicine. NB For a general discussion of CAM saftey, see p. 24

RISKS

CONTRAINDICATIONS

Broken skin, pregnancy and lactation (see p. 4).

PRECAUTIONS/WARNINGS

Products, particularly those prepared from the roots, may contain liver-toxic pyrrolizidine alkaloids and are not recommended for internal use. Should not be used for more than 6 weeks a year.

ADVERSE EFFECTS

Veno-occlusive disease, liver damage (oral usage).

OVERDOSE

Daily use should not exceed 100 μg of the pyrrolizidine alkaloids.

INTERACTIONS

Risk of additive toxicity with concomitant use of other pyrrolizidine alkaloid-containing herbs.

QUALITY ISSUES

Only products with reduced toxicity levels should be used. Some products labelled comfrey or *Symphytum officinale* instead contain the more toxic prickly comfrey.

An evidence-based judgement on whether the medicine does more good than harm. NB A lack of compelling evidence is not the same as ineffectiveness

RISK–BENEFIT ASSESSMENT

There is encouraging yet limited evidence for the effectiveness of comfrey ointment in the treatment of ankle distortions. Cautiously used on unbroken skin only, it might be a useful adjunct in this indication but further evidence is required to make any firm recommendations.

REFERENCES

1. Predel HG, Giannetti B, Koll R, Bulitta M, Staiger C. Efficacy of a comfrey root extract ointment in comparison to a diclofenac gel in the treatment of ankle distortions: results of an observer-blind, randomized, multicenter study. Phytomedicine 2005;12:707–714
2. Koll R, Buhr M, Dieter R, Pabst H, Predel HG, Petrowicz O, Giannetti B, Klingenburg S, Staiger C. Efficacy and tolerance of a comfrey root extract (Extr. Rad. Symphyti) in the treatment of ankle distorsions: results of a multicenter, randomized, placebo-controlled, double-blind study. Phytomedicine 2004;11:470–477
3. Kucera M, Barna M, Horacek O, Kovarikova J, Kucera A. Efficacy and safety of topically applied Symphytum herb extract cream in the treatment of ankle distortion: results of a randomized controlled clinical double blind study. Wien Med Wochenschr 2004;154: 498–507
4. Kucera M, Barna M, Horacek O, Kalal J, Kucera A, Hladikova M. Topical symphytum herb concentrate cream against myalgia: a randomized controlled double-blind clinical study. Adv Ther 2005;22:681–692

SECTION 5 PAIN SYNDROMES

This section includes chapters on pain syndromes commonly seen by clinicians for which CAM is popular. Chapters are presented in alphabetical order and are subdivided according to the subheadings shown in the example below (headache).

TABLE

Other frequently used treatments for specific conditions lacking sound evidence and pain syndromes for which no sufficient evidence is available are presented in a table at the end of this section.

HEADACHE

SYNONYMS/SUBCATEGORIES

Tension headache, chronic or episodic tension-type headache, cephalodynia, cephalalgia, cephalea, cerebralgia, encephalalgia, encephalodynia, cervicogenic headache (formerly muscle tension headache). For migraine see p. 275.

DEFINITION

The 1988 International Headache Society criteria for chronic tension-type headache are headaches on 15 or more days a month (180 days/year) for at least 6 months; pain that is bilateral, pressing or tightening in quality, of mild or moderate intensity, which does not prohibit activities and is not aggravated by routine physical activity; presence of no more than one additional clinical feature (nausea, photophobia or phonophobia) and no vomiting. Episodic tension-type headache can last for 30 minutes to 7 days and occurs for fewer than 180 days a year.

CAM USAGE

Thirty-two per cent of Americans with headache have used CAM in the previous 12 months, most frequently relaxation and chiropractic.[1] Many other therapies are also popular, especially herbal medicine, homeopathy, acupuncture and reflexology.

RELATED CONDITIONS

Migraine (see p. 275).

CLINICAL EVIDENCE

A Cochrane review[2] found encouraging evidence for spinal manipulation, therapeutic touch, electrotherapy and transcutaneous electrical nerve stimulation (TENS) for treating tension-type headaches. It also noted that spinal manipulation and exercise are promising for cervicogenic headache.

ACUPUNCTURE

Three good-quality studies were included in a systematic review.[3] It concluded that acupuncture might have a role to play in idiopathic headache but the current evidence was insufficient to make firm recommendations. Since then, results of RCTs have been mixed. Three placebo-controlled RCTs ($n = 69$, $n = 37$ and $n = 50$) suggested positive effects of acupuncture on pain or quality of life.[4–6]

AUTOGENIC TRAINING

In one study, 146 patients with tension headache were randomised to autogenic training, hypnotherapy or waiting list control.[13] Autogenic training (but not hypnotherapy) was better than waiting list for symptom control.

BIOFEEDBACK

A systematic review[14] (Box 5.21) concluded that both relaxation and biofeedback (either on its own or in combination with relaxation) were superior to no treatment and to placebo therapy. Subsequent RCTs[15–17] (Table 5.16) tested biofeedback in adolescents and adults, mainly in comparison with relaxation. The majority found that biofeedback was more effective.

EXERCISE

A small ($n = 53$) RCT suggested that workplace physical exercise reduces headaches during a 4-week period.[20]

HERBAL MEDICINE

In an RCT involving 41 adults with a history of tension headache, 164 acute headache episodes were treated with either peppermint oil or placebo oil locally and either paracetamol (acetaminophen) or placebo tablet orally.[21] Peppermint oil was superior to placebo and not different from the analgesic drug in reducing headache.

HOMEOPATHY

One rigorous RCT with 98 subjects included patients with tension-type headache as well as those with migraine and found no benefit from 12 weeks of individualised homeopathy compared with placebo.[23] The results were similar after 1 year of follow-up.[24]

HYPNOTHERAPY

Like other forms of therapy involving regular relaxation, self-hypnosis appears to be more effective than waiting list control.[25]

Quoted from BMJ Clinical Evidence (see p. 16) where availabe

Information on the use of CAM by patients with the condition

An evidence-based summary of the data relating to the effectiveness of different forms of CAM for the condition. Priority is given to systematic reviews/meta-analyses and RCTs. Treatments are listed in alpabetical order (except Other therapies; see below)

Brief overview of the evidence relating to a treatment for the condition

Summary details of any authoritative systematic review/meta-analysis on a subject

Box 5.21 *Meta-analysis: biofeedback and relaxation for headache*[14]

- All prospective investigations, including uncontrolled studies
- Seventy-eight studies were included in the review, involving 2866 patients
- Mean (SD) effect size from 29 studies of EMG biofeedback was 47% (26%)
- Mean (SD) effect size from 38 studies of relaxation was 36% (20%)
- For comparison, mean (SD) effect size from pharmacological treatment was 39% (23%) and for placebo treatment was 20% (38%)
- **Conclusion**: biofeedback is likely to be an effective option for headache

Optional standardised tables of RCTs.
NB When several exist, only a few examples appear in the table, selected for their rigour or clinical relevance

Table 5.15 **Parallel-arm RCTs of biofeedback for headache**

Reference	Sample size	Interventions (regimen)	Result	Comment
Arena[15]	26	(A) Frontal EMG biofeedback [12 sessions] (B) Trapezius EMG biofeedback [12 sessions] (C) Relaxation [seven sessions]	B better than A or C at 3 months	
Bussone[16]	35	(A) Biofeedback relaxation [10 sessions in 5 weeks] (B) Relaxation placebo	A better than B at 1 year	Adolescents
Kroner-Herwig[17]	50	(A) Biofeedback [12 30-minute sessions in 6 weeks] (B) Relaxation [six 1-hour sessions in 6 weeks] (C) Untreated control	No difference between A and B. Both better than C for some outcomes	Children; parental involvement had no influence

However, it is not clear whether it is superior to other forms of relaxation. Several trials have compared different combinations of therapies including hypnotherapy with various control interventions.[13,26] Subjects who are highly hypnotisable tend to show a greater reduction of headaches than those who are less easily hypnotised.[13]

RELAXATION

A systematic review[14] of biofeedback and relaxation (Box 5.21) concluded that relaxation is effective, with a mean effect size of 36%. In children and adolescents, RCTs indicate that relaxation has a positive effect on tension headache, though the size of the effect is often modest. More than two-thirds of the children in one study ($n = 26$) recorded at least 50% improvement at follow-up after 6 months, compared with only a quarter of controls.[27]

SPINAL MANIPULATION

The most recent and authoritative systematic review[30] of spinal manipulation found that, because of the small number and poor quality of the primary data, it is not possible to draw valid conclusions about the effectiveness of this approach (Box 5.22). An independent research group reached similar conclusions regarding both spinal manipulation and mobilisation.[31]

OTHER THERAPIES

Cranial electrotherapy applies a high-frequency, low-intensity current transcranially. It was found to be more effective in treating acute headache than placebo in a multicentre RCT of 100 patients, reducing headache scores by 35% after 20 minutes compared with 18% in the placebo group.[32]

Imagery was used as an adjunct to standard medical treatment in an RCT of 260 adults with chronic tension headache with or without migraine.[33] The intervention group received an imagery tape to listen to every day for 1 month and controls received standard medical treatment alone. Imagery was superior in global assessment and some quality of life measures.

Box 5.22 *Systematic review: spinal manipulation for tension-type headache*[30]

- Four RCTs were included
- Three studies were of chiropractic, one of osteopathic techniques
- Overall methodological quality was poor
- Best evidence synthesis generated no convincing evidence for spinal manipulation
- Few adverse events were reported
- **Conclusion**: the evidence is insufficient

OVERALL RECOMMENDATION

The evidence is not convincing that any particular CAM therapy is more effective than placebo in preventing tension headaches. However, in the absence of genuinely safe and effective conventional preventive measures, patients may benefit from treatments involving relaxation. Relaxation in various forms, including muscular and mental relaxation, hypnotherapy and autogenic training, is simple, relatively safe and beneficial compared with no treatment. The addition of biofeedback may increase the benefit compared with simple relaxation alone. In the treatment of acute headache, preliminary evidence supports the use of tiger balm or peppermint oil locally, and possibly electrotherapy. It seems unlikely, however, that these options are superior to conventional treatments.

An evidence-based judgement evaluating the benefits and risks of CAM for the condition in relation to conventional treatments. NB A lack of compelling evidence is not the same as ineffectiveness

Table 5.16 **Summary of clinical evidence for headache**

Treatment	Weight of evidence	Direction of evidence	Serious safety concerns
Acupuncture	OO	→	Yes (see 96)
Autogenic training	O	↗	Yes (see 106)
Biofeedback	OOO	↗	No (see 110)
Herbal medicine			
Peppermint oil (local)	O	↑	Yes (see 209)
Tiger balm (local)	O	↗	Yes (see 4)
Homeopathy	O	↓	No (see 124)
Hypnotherapy	OO	↗	Yes (see 130)
Relaxation	OO	↗	No (see 158)
Spinal manipulation	OO	→	Yes (see 112)

For each treatment, the totality of available evidence is assessed and presented according to three criteria: 1) weight of evidence; 2) direction of evidence; 3) serious safety concerns (see p. 5 for explanations)

REFERENCES

1. Eisenberg DM, Davis R, Ettner SL, Appel S, Wilkey S, Rompay MV. Trends in alternative medicine use in the United States, 1990–1997. JAMA 1998;280:1569–1575
2. Bronfort G, Nilsson N, Haas M, Evans R, Goldsmith CH, Assendelft WJJ, Bouter LM. Non-invasive treatments for chronic/recurrent headache. The Cochrane Database of Systematic Reviews 2004, Issue 3. Art No.: CD001878

SIGNIFICANCE LEVELS

When reporting research results, only differences that are statistically significant ($P < 0.05$) are mentioned; P values and the term 'significant' are omitted for conciseness.

WEIGHT OF EVIDENCE

The weight of the evidence refers to the level of confidence (see p. 4) that can be placed on it. There are three discrete categories of weight:

Low	O
Moderate	OO
High	OOO

The judgement of weight is based on a combination of three largely independent factors:

- the level of evidence (the highest level being systematic review/meta-analysis, followed by randomised clinical trial, controlled clinical trial and uncontrolled study)
- the methodological quality of the investigations (the validity and reliability of the studies)
- the volume of information (the number of studies and their sample sizes).

Judgements take into account all three of these dimensions of weight. Therefore a treatment for which volume and level are high (e.g. a meta-analysis of 50 studies) will not necessarily receive a high weight if the quality is low (e.g. methodologically flawed studies). Similarly, even if quality and level are high (e.g. a rigorous randomised clinical trial), weight can only be considered low if there is a low volume of evidence (only a single trial).

DIRECTION OF EVIDENCE

The direction of the evidence refers to the collective positive or negative outcome of the studies for that treatment. Direction can be reported in one of five ways:

Clearly positive	↑
Tentatively positive	↗
Uncertain	→
Tentatively negative	↘
Clearly negative	↓

Direction is largely judged independently of weight of evidence. The reader must interpret the direction of the evidence in the light of its weight. For example, a clearly positive result based on evidence with low weight (e.g. a single, small, non-randomised trial) may not be as informative as a tentatively positive finding backed by a body of evidence with high weight (e.g. a systematic review of randomised clinical trials).

SERIOUS SAFETY CONCERNS

Cases where a treatment has been, or may potentially be, associated with life-threatening consequences, hospitalisation or sustained harm, are indicated even if rare.

- 'No' indicates that reports of serious events were not located and are considered unlikely.
- 'Yes' indicates that serious events have been reported or are considered possible.

Whenever possible, page references are provided for the treatment's own chapter or relevant table. In some cases, information is not available about safety. The general principle is to err on the side of caution; so when in doubt, a treatment is marked 'Yes'. This applies to all herbs and some supplements (see *Methods*, p. 5).

NB. It is imperative that the reader refers to the treatment chapter or table. Even where a treatment is marked 'No', there may be contraindications and precautions that, if ignored, could have potentially serious consequences.

Even where a therapy is not associated with serious complications, indirect risks may exist and could have serious consequences. CAM practitioners may not be medically qualified and should not therefore be expected to have competence in orthodox medical diagnostics or management.

Many of the reported serious adverse events are avoidable through good clinical practice. For a general discussion of CAM safety, see p. 24.

BIBLIOGRAPHY OF MAIN REFERENCE SOURCES

SECTION 3 THERAPIES

Barnett H. The Which? guide to complementary therapies. London: Which?; 2002

Callahan D, ed. The role of complementary and alternative medicine. Washington: Georgetown University Press; 2002

Freeman L. Mosby's complementary and alternative medicine evidence-based approach. St Louis: Mosby; 2001

Fugh-Berman A. Alternative medicine: what works. Tucson: Odonian; 1996

Jonas WB, Levin JS, eds. Essentials of complementary and alternative medicine. Baltimore: Lippincott Williams and Wilkins; 1999

Kelner MJ, Wellman B, Saks M, eds. Complementary and alternative medicine: challenge and change. Reading: Harwood Academic Publishers; 2000

Lewith G, Jonas WB, Walach H. Clinical research in complementary therapies. Edinburgh: Churchill Livingstone; 2001

MacBeckner W, Berman BM. Complementary therapies on the internet. St Louis: Churchill Livingstone, USA; 2003

Micozzi, MS. Fundamentals of complementary and alternative medicine. Edinburgh: Churchill Livingstone; 2000

Novey DW, ed. Clinician's complete reference to complementary and alternative medicine. St Louis: Mosby; 2000

Peters D, Woodham A. The complete guide to integrated medicine: the best of complementary and conventional care. New York: Dorling Kindersley; 2000

Schimmel KC, ed. Lehrbuch der Naturheilverfahren. Stuttgart: Hippokrates; 1990

Spencer JW, Jacobs J. Complementary and alternative medicine: an evidence-based approach, 2nd edn. St Louis: Mosby; 2003

Stone J. An ethical framework for complementary and alternative therapies. London: Routledge; 2002

Yuan CS, Bieber EJ. Textbook of complementary and alternative medicine. London: Parthenon; 2003

Zollman C, Vickers A. ABC of complementary medicine. London: BMJ Books; 2000

SECTION 4 HERBAL AND NON-HERBAL MEDICINES

Barnes J, Anderson LA, Phillipson JD. Herbal medicines, 2nd edn. London: Pharmaceutical Press; 2002

Basch E, Ulbricht C E, eds. Natural standard herb and supplement handbook: the clinical bottom line. St Louis: Elsevier Mosby; 2005

Blumenthal M, ed. The ABC clinical guide to herbs. Austin: American Botanical Council; 2003

Blumenthal M, Goldberg A, Brinckmann J, eds. Herbal medicine: expanded commission E monographs. Austin: American Botanical Council; 2000

Boon H, Smith M. The botanical pharmacy. Kingston: Quarry Press; 1999

Boon H, Smith M. The complete natural medicine guide to the 50 most common medicinal herbs. Toronto: Robert Rose; 2004

Bratman S, Gitman AM. Mosby's handbook of herbs and supplements and their therapeutic uses. St Louis: Mosby; 2003

Braun L, Cohen M. Herbs and natural supplements. An evidence-based guide. Sydney: Elsevier; 2005
Brinker F. Herb contraindications and drug interactions. Sandy: Eclectic Medical Publications; 1998
Capasso F, Gaginella TS, Grandolini G, Izzo AA. Phytotherapy: a quick reference to herbal medicine. Berlin: Springer-Verlag; 2003
Cupp MJ. Toxicology and clinical pharmacology of herbal products. Totowa, NJ: Humana Press; 2000
Dukes MNG, Aronson JK, eds. Meyler's side effects of drugs, 14th edn. Amsterdam: Elsevier; 2000
Ernst E. Herb–drug interactions – an update. Perfusion 2003;16:175–194
Fetrow C, Avila J. The complete guide to herbal medicines. Springhouse: Springhouse Corporation; 2000.
Fetrow CW, Avila JR. Professional's handbook of complementary and alternative medicines. Springhouse, PA: Springhouse; 1999
Fugh-Berman A. Herb–drug interactions. Lancet 2000;355:134–138
Fugh-Berman A. The 5-minute herb and dietary supplement consult. Philadelphia: Lippincott Williams & Wilkins; 2003
Hänsel R, Keller K, Rimpler H, Schneider G. Hagers Handbuch der pharmazeutischen Praxis. Berlin: Springer; 1994
Harkness R, Bratman S. Mosby's handbook of drug–herb and drug–supplement interactions. St Louis: Mosby; 2003
Hildebrandt H, ed. Pschyrembel Wörterbuch Naturheilkunde und alternative Heilverfahren. Berlin: deGruyter; 1996
Lininger SW, ed. A–Z guide to drug–herb–vitamin interactions. Rocklin; CA: Prima; 1999
Mahady GB, Fong HHS, Farnsworth NR. Botanical, dietary supplements: quality, safety and efficacy. Rotterdam: AA Balkema Publishers; 2001
Mason P. Dietary supplements, 2nd edn. London: Pharmaceutical Press; 2001. Available online: http://www.medicinescomplete.com/mc/
Meletis CD, Jacobs T. Interactions between drugs and natural medicines. Sandy: Eclectic Medical Publications; 1999
Murray MT. Encyclopedia of nutritional supplements. Rocklin: Prima; 1996
Jellin JM, ed. Natural Medicines Comprehensive Database. Available online: www.naturaldatabase.com
Natural Standard Database. Available online: www.naturalstandard.com
Rapport L, Lockwood B. Nutraceuticals. London: Pharmaceutical Press; 2002
Reynolds Sweetman SJEF, ed. Martindale: the complete drug reference. Martindale: the extra pharmacopoeia. London: Pharmaceutical Press; 2005. Available online: http://www.medicinescomplete.com/mc/
Ross IA. Medicinal plants of the world, Vol. 2. Totowa, NJ: Humana Press; 2001
Rotblatt M, Ziment I. Evidence-based herbal medicine. Philadelphia: Hanley & Belfus; 2002
Royal Pharmaceutical Society of Great Britain, ed. British national formulary. London: Pharmaceutical Press; 2005. Available online: http://www.medicinescomplete.com/mc/
Schulz V, Hänsel R, Blumenthal M, Tyler VE. Rational phytotherapy: a reference guide for physicians and pharmacists, 5th edn. Berlin: Springer Verlag; 2004
Skidmore-Roth L. Mosby's handbook of herbs & natural supplements. St Louis: Mosby; 2001
Stockley IH, ed. Stockley's interaction alert. London: Pharmaceutical Press; 2005. Available online: http://www.medicinescomplete.com/mc/
Ulbricht CE, Basch E, eds. Natural standard herb and supplement reference: evidence-based clinical reviews. St Louis: Elsevier Mosby; 2005
USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) Online Database. Beltsville, MD: National Germplasm Resources Laboratory. Available online: http://www.ars-grin.gov2/cgi-bin/npgs/html/index.pl
Wichtl M, ed. Herbal drugs and phytopharmaceuticals, 3rd edn. Stuttgart: Medpharm Scientific Publishers; 2004
World Health Organization. Monographs on selected medicinal plants. Geneva: WHO; 1999

SECTION 5 PAIN SYNDROMES

Banks C, Mackrodt T. Chronic pain management. London: Whurr; 2005
British Medical Journal. Clinical evidence. British Medical Journal Publishing Group; 2005. Available online: http://www.clinicalevidence.com
Gatchel R. Clinical essentials of pain management. Philadelphia: American College of Physicians; 2005