



COST-EFFECTIVENESS OF MANUAL THERAPY FOR THE MANAGEMENT OF MUSCULOSKELETAL CONDITIONS: A SYSTEMATIC REVIEW AND NARRATIVE SYNTHESIS OF EVIDENCE FROM RANDOMIZED CONTROLLED TRIALS

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ABSTRACT

Objectives: The purpose of this study was to systematically review trial-based economic evaluations of manual therapy relative to other alternative interventions used for the management of musculoskeletal conditions.

Methods: A comprehensive literature search was undertaken in major medical, health-related, science and health economic electronic databases.

Results: Twenty-five publications were included (11 trial-based economic evaluations). The studies compared cost-effectiveness and/or cost-utility of manual therapy interventions to other treatment alternatives in reducing pain (spinal, shoulder, ankle). Manual therapy techniques (eg, osteopathic spinal manipulation, physiotherapy manipulation and mobilization techniques, and chiropractic manipulation with or without other treatments) were more cost-effective than usual general practitioner (GP) care alone or with exercise, spinal stabilization, GP advice, advice to remain active, or brief pain management for improving low back and shoulder pain/disability. Chiropractic manipulation was found to be less costly and more effective than alternative treatment compared with either physiotherapy or GP care in improving neck pain.

Conclusions: Preliminary evidence from this review shows some economic advantage of manual therapy relative to other interventions used for the management of musculoskeletal conditions, indicating that some manual therapy techniques may be more cost-effective than usual GP care, spinal stabilization, GP advice, advice to remain active, or brief pain management for improving low back and shoulder pain/disability. However, at present, there is a paucity of evidence on the cost-effectiveness and/or cost-utility evaluations for manual therapy interventions. Further improvements in the methodological conduct and reporting quality of economic evaluations of manual therapy are warranted in order to facilitate adequate evidence-based decisions among policy makers, health care practitioners, and patients. (*J Manipulative Physiol Ther* 2014;37:343-362)

Key Indexing Terms: *Cost-Effectiveness; Cost-Utility; Manual Therapy; Systematic Review; Back Pain; Chiropractic*

Manual therapy is a skilled nonsurgical conservative management using the practitioner's hands and/or fingers on the patient's body for the purpose of

assessing, diagnosing, and treating a variety of symptoms and conditions.^{1,2} Manual therapy is used within the traditional medical (eg, physiotherapy, orthopedics, and

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sports medicine) and complementary and alternative medicine context (eg, chiropractic and osteopathy) and consists of different techniques (eg, manipulation, mobilization, static stretching, and muscle energy techniques). The definition and purpose of manual therapy vary across health care professionals.

The use of manipulation and mobilization has been recommended in clinical practice guidelines in the United States, Great Britain, Canada, and the Netherlands.^{3–9} Although past research evidence on the clinical effectiveness^{10–19} and safety^{20–27} of manual therapy relative to other interventions is abundant, the evidence on cost-effectiveness is insufficient and inconclusive.^{28–36} Moreover, to our best knowledge, a systematic review of full economic evaluations of recent evidence (ie, cost-effectiveness [CEA] and/or cost-utility analysis [CUA]) alongside randomized controlled trials (RCTs) of manual therapy has not been conducted.

In light of limited health care resources, policy makers, health care providers, and researchers need to make informed decisions in prioritizing and allocating resources to the provision of health care interventions that are both effective and cost saving. Ideally, the decision-making process should be based on high-quality evidence summarizing incremental costs and effects of a health care intervention of interest compared with alternative interventions.

The aim of this review was to systematically identify, appraise, and evaluate the evidence on trial-based economic evaluations (cost-effectiveness and/or cost-utility) of manual therapy relative to other alternative interventions used for the management of musculoskeletal conditions.

METHODS

This review is part of a large technical report of comparative benefits and harms of manual therapy interventions for the management of musculoskeletal and nonmusculoskeletal conditions, commissioned by the Royal College of Chiropractors in the United Kingdom (<http://www2.warwick.ac.uk/fac/med/research/hscience/pet/reportforcollegeofchiropractors/>).

A comprehensive literature search was undertaken as part of a wider search for this report. The following medical, health-related, science and health economic electronic databases were searched (through August 2011): MEDLINE (Ovid), Embase, Mantis, Index to Chiropractic Literature, CINAHL, Cochrane Airways Group trial register, Cochrane Complementary Medicine Field register, and Cochrane Rehabilitation Field register (via CENTRAL), Science Citation Index, AMED, CDSR, National Health Service (NHS) DARE, NHS HTA, NHS EED, CENTRAL, ASSIA, and Social Science Citation Index. The search strategy used in MEDLINE is provided in [Appendix 1](#). Search terms were restricted to subject heading and free-text terms related to manual therapy. Broader terms such as “physiotherapy” were not included because initial tests suggested that the volume of the literature identified using such a broad search strategy would not be manageable. To keep the

search as open as possible, no condition terms were included. The search was limited to the study types included in the wider report by the use of recognized search filters, including the NHS Centre for Reviews and Dissemination NHS EED filter (see: <http://www.crd.york.ac.uk/>). This performance of this filter has been tested.³⁷ No date limits were applied. The search results were updated on February 15, 2013. Additional studies were sought through references of relevant primary studies and systematic reviews.

This review included English-language full-text publications of RCTs that evaluated the cost-effectiveness and/or cost-utility of manual therapy (eg, manipulation, mobilization, static stretching, chiropractic care, muscle energy techniques alone or in combination) compared with alternative interventions (eg, no treatment, placebo, and usual care) used for the management of musculoskeletal conditions. We defined *musculoskeletal conditions* as disorders of muscles, nerves, tendons, ligaments, joints, cartilage, and spinal disks that develop over time. They can be categorized as spinal (eg, mid, low back or neck pain, sciatica, and headaches), upper extremity (eg, shoulder disorders, carpal tunnel syndrome, and lateral epicondylitis), and lower extremity (eg, ankle sprain) disorders.

We excluded studies where manual therapy was used to treat acute injuries such as fractures and dislocations (eg, to realign bones), except when used for rehabilitation purposes. Studies reporting only costs, only outcomes, reviews, protocols, and conference abstracts were excluded. Cost-consequence studies were excluded because they present an array of different outcomes and cost measures. Studies for which there was insufficient information to calculate the incremental cost-effectiveness ratios (ICERs) for CEA or CUA were also excluded.

Two independent reviewers (A.T. and P.S.) screened all identified bibliographic records for title/abstract and then for full text. Any disagreements were resolved through consensus or by recourse to a third-party reviewer (A.C.). The first author independently extracted relevant data from included studies which was checked by another reviewer (P.S.). The extracted data included study characteristics (eg, author name, country, year of publication, sample size, and follow-up duration), types of participants (eg, condition, age, and sex), types of interventions/comparators, type of economic analysis (cost-effectiveness, cost-utility), perspective (societal, health care system, individual), study currency, discounting, and information pertinent to risk of bias (ROB)/study quality assessment items. The outcomes included pain/disability scores, quality of life (QOL) measures, quality-adjusted life-years (QALYs), costs, and ICERs. We converted mean costs to UK £2012 prices using country-specific gross domestic product deflators³⁸ and Purchasing Power Parities from Organisation for Economic Co-operation and Development (£1 = US \$1.45 in 2012 prices).³⁹ We calculated ICERs for each study, if not

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