A systematic review of physical and rehabilitation medicine topics, as developed by the Cochrane Collaboration

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As a relatively new field that borders traditional medicine and society, rehabilitation was once considered to be less important among the clinical medical specialties, and lacked reliable evaluation tools, precise clinical practices, and extensive research.1-4 However, this situation is changing today: research is growing rapidly, and rehabilitation is gaining a relevant place in the Western world, due in part to the aging of the population and the subsequent rise of chronic diseases.2

To strengthen the scientific base that investigates the clinical work of physiatrists and rehabilitation professionals, we decided to focus on the work of the Cochrane Collaboration, an independent international not-for-profit organization that is dedicated to giving up-to-date, accurate information on the effects of healthcare worldwide.5 While starting a systematic search of interesting Cochrane reviews for publishing, we felt the need to systematically look at what is already in the Cochrane Library to offer an overview of its contents on rehabilitation.

The aim of this paper is to give an overview of the Cochrane Collaboration, its development over the years, and its usefulness for physical and rehabilitation medicine specialists. After introducing the Cochrane Collaboration, we systematically analyzed all titles of the reviews in each of the 50 review groups. For “Rehabilitation,” we included not only exercise and physical therapy, but also all of the educational and pharmacological interventions aimed at supporting rehabilitation. The search was performed using Issue 2, 2007 of the Cochrane Library. We retrieved 138 completed reviews that dealt with rehabilitation interventions performed by 20 review groups. No umbrella reviews could be found at present. The most prolific groups in the rehabilitation field were: musculoskeletal (28 reviews), stroke (20), back (18), and the movement disorder group (13). The most discussed intervention was exercise (37 reviews), dealing with physical medicine (20) and pharmacological intervention (11). Six other reviews dealt with multidisciplinary rehabilitation. Low back pain treatment and stroke were the most investigated topics. The Cochrane Collaboration serves today as a main step in increasing an evidence-based approach to medicine and rehabilitation. Europa Medicophysica is continuously increasing its importance and presence in the world of physical and rehabilitation medicine, and part of its mission is to increase and strengthen an evidence-based approach to this field. We will continue to look at the contents of the Cochrane database and regularly report on its updates concerning topics of interest for physical and rehabilitation medicine.

KEY WORDS: Rehabilitation - Reviews - Treatment, outcome.

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Overview of the Cochrane Collaboration for rehabilitation professionals

The aim of this section is to give an overview of what the Cochrane Collaboration is, and what it has developed over the years that is useful for physical and rehabilitation medicine specialists.

The Cochrane Collaboration

The Cochrane Collaboration produces and disseminates systematic reviews of healthcare interventions and promotes the search for evidence in the form of clinical trials and other studies of interventions. The Cochrane Collaboration was founded in 1993 and was named after the British epidemiologist Sir Archie Cochrane.6

Those who prepare the reviews are mostly healthcare professionals who volunteer to work in one of the many Cochrane review groups, serving with editorial teams who oversee the preparation and maintenance of the reviews as well as the application of rigorous quality standards. Currently, there are 50 review groups that prepare and update systematic reviews about specific topics in health care.5

The major product of the Collaboration is the Cochrane Database of Systematic Reviews, which is published quarterly as part of the Cochrane Library. Issue 2, 2007 of the Cochrane Library contains 3094 Cochrane-completed systematic reviews and 1707 protocols (background, objectives and methods of systematic reviews in preparation); 6113 abstracts of reviews of effect in the Database of Abstracts of Reviews of Effects (DARE), which is the only database containing abstracts of systematic reviews that includes a summary of the review together with a critical commentary about the overall quality; 495 002 RCTs in the Cochrane Central Register of Clinical Trials.7

The Cochrane reviews

A systematic review identifies an intervention for a specific disease or other problem in health care and determines whether or not this intervention works. To do this, authors locate, appraise, and synthesize evidence from as many relevant scientific studies as possible. They summarize conclusions about effectiveness, and provide a unique collation of the known evidence on a given topic, so that others can easily review the primary studies for any intervention.

Cochrane systematic reviews differ from other types of reviews in that they adhere to a strict design in order to make them more comprehensive, thus minimizing the chance of bias and ensuring their reliability. Rather than reflecting the views of the authors or being based on a partial selection of the literature (as is the case with many articles and reviews that are not explicitly systematic), they contain all known references to trials on a particular intervention and a comprehensive summary of the available evidence. Reviewers who prepare a systematic Cochrane review must adhere to the methodological indications contained in the Cochrane Handbook.6 The handbook mandates that they search for primary studies to be included in the reviews in many databases, registers of clinical trials, and other sources of unpublished studies; they must also assess the methodological quality of included primary studies according to validated criteria. Before publication in the Cochrane Library, reviews and protocols are submitted to an evaluation process by methodologists and clinical experts in the specific topic. Another peculiarity of the Cochrane reviews is that they are regularly updated every 2-4 years.6 The reviews are therefore also valuable sources of information for those receiving care, as well as for decision-makers and researchers. Cochrane systematic reviews deal with all aspects of health care: primary prevention, treatment and rehabilitation.

The Cochrane umbrella reviews

Cochrane reviews (CRs) are widely appreciated for being rigorously developed and for being committed to continuous update. However, they have also been criticised for being cumbersome to read and too narrowly focused on individual questions (e.g., drug A vs B). This makes CRs difficult to use for practicing doctors who have to read several individual reviews to gain a full grasp on what works and does not work in a given disease/health problem. For example, one may be interested in the pharmacological treatment of stroke and find many reviews in the Library, which leaves it up to the user to make up his/her mind about the relative merits of different treatment options. The
need for a more comprehensive yet rigorous approach has been discussed at length within and outside the Collaboration, and the idea of producing the so-called “umbrella reviews” promises to be a significant solution to fill the gap outlined above.

An umbrella review (UR) is a summary of evidence from existing Cochrane reviews structured into one accessible and usable document. The umbrella review has its focus on a specific condition or health problem for which there are several potential interventions: URs include two or more Cochrane reviews that have addressed these interventions, and their results. The principal audience for a UR is a decision maker such as a clinician, policy maker or an informed consumer who approach the Cochrane Library for evidence on a specific problem. The aim of a UR is to facilitate access to relevant reviews, to serve as a “friendly front end” to the Cochrane Library and to allow the reader a quick overview (and an exhaustive list) of Cochrane reviews relevant to the clinical decision at hand. A UR would only summarise results of existing reviews in the Cochrane Library but would not review the literature, add more outcomes and studies, formally critique the existing reviews or undertake a more detailed analysis including critical appraisal. To allow quick and easy access, the format and organization of a UR is simpler than a traditional CR, usually including a limited number of figures and fewer references than CRs.

As with other Cochrane efforts, anyone wanting to do a UR may propose one to the relevant Collaborative review groups. Fields and Cochrane centers are strongly encouraged to set priority areas for UR development and to attempt to find authors for them. As with other Cochrane reviews, URs require a protocol. They could be fairly brief and include the clinical question, the reviews to be included, the pre-specified outcomes to be considered and the analyses to be performed. Authors of a UR will take responsibility for clearly describing important methodological differences in the text of the review and for deciding if the differences are so great that the results cannot be presented in a single summary table. Usually, an appropriate collaborative review group will have editorial control over each UR.

Thus far, only a handful of URs have been planned, prepared, and published in “Evidence-Based Child Health: A Cochrane Review Journal”. One protocol has instead been published on the topic of Cochrane Library Dopamine agonist therapy in early Parkinson’s disease. In areas characterised by complex interventions and by a wide range of different approaches, such as rehabilitation, URs may be particularly useful. Moreover, URs may help people doing reviews in this field to overcome the feeling that too few individual studies are available that focus on the narrow question that is being addressed by a typical Cochrane review.

The Cochrane Rehabilitation Field

Rehabilitation is considered by the Cochrane Collaboration as a field, a term that identifies health issues and/or intervention types of importance to specific populations, and facilitates reviews across the relevant review groups. Rehabilitation is a cross-sectional topic, dealing with different disciplines, so there is not a rehabilitation group.

The rehabilitation and related therapies field has its headquarters in Maastricht, at the epidemiology institute of that university. Since its inception, the director of the headquarters has been Professor Rob de Bie. The mission of the field is to search, collect, and disseminate evidence about rehabilitation and to assist people who want to write systematic reviews. Professor de Bie is assisted by an advisory board. The activities of the field are: 1) to maintain a database containing all relevant articles concerning the effectiveness of physical therapy and rehabilitation techniques; 2) to collaborate with PEDro (Physiotherapy Evidence Database), a database that gathers randomised controlled trials, systematic reviews and good clinical practice guidelines in rehabilitation; 3) to support and directly organize courses to encourage an evidence-based practice; 4) to collect the most frequently used clinical measurement instruments in rehabilitation; 5) to maintain a database of the best 500 PEDro articles in free full text on the field’s website.

Bibliometric analysis of Cochrane reviews of rehabilitation interest

The aim of this section was to overview the currently available reviews in the rehabilitation field.

Methods

In order to retrieve all the Cochrane systematic and umbrella reviews dealing with rehabilitation, we systematically analyzed all the titles of reviews of each of
the 50 review groups. For rehabilitation, we included not only exercises and physical therapy, but also all the educational and pharmacological interventions aimed at supporting rehabilitation and related settings. We excluded from the search process all registered review protocols not yet complete. The search was performed on Issue 2, 2007 of the Cochrane Library.7

Results

We retrieved 138 completed reviews (Appendix I) which dealt with rehabilitation interventions performed by 20 review groups. No umbrella reviews could be found at present. The most prolific groups in the rehabilitation field are the musculoskeletal group (28 reviews), the stroke group (20), the back group (18) and the movement disorder group (13). The most discussed interventions are exercises, with 37 reviews; physical medicine with 20 reviews; and pharmacological intervention with 11. Six reviews dealt with multidisciplinary rehabilitation. Low back pain treatment is the most investigated topic, with 13 reviews focused on it. Stroke is also a main topic (20 reviews), but many reviews are focused on single aspects of this pathology. A complete list of the topics covered by the reviews is presented in Appendix I.

Discussion

For many years, rehabilitation medicine has been considered an unscientific discipline, due to the lack of good quality research and reliable data and tools. Rehabilitation is a cross-sectional topic, dealing with different disciplines, a fact that has limited research on rehabilitation to an extent, as it is often considered a less noble topic than more important disciplines. Today, this is rapidly changing, as demonstrated by the increasing number of papers dealing with rehabilitative topics.4 Moreover, the quality of rehabilitation research is quickly improving, and this is a central point on the long way to an evidence-based clinical practice.4

The interest of the Cochrane Collaboration in the field of rehabilitation is a consequence of this ongoing process.8 Frequently, pathologies like stroke and low back pain have such an impact on health systems and relevant social and economic costs that a big part of research is focused on them. A total of 8313 articles dealing with stroke rehabilitation are today present in PubMed, as are 8440 articles about low back pain treatment. It could be difficult to derive a practical knowledge and information from such a huge amount of literature. Thus, the possibility of systematic reviews is an important tool, especially for clinicians, in order to discriminate the quality of literature and derive practical information.

Inside the Cochrane Collaboration, the musculoskeletal group, the stroke group and the back group are today the most prolific within the rehabilitation field (BIB Issue 2).151 This is probably a result of the great number of articles in these fields. Low back pain is the more homogenous topic, which is probably the reason for its prominence among other review topics. On the other hand, musculoskeletal disease rehabilitation is a large and heterogeneous group in which there is great interest. Despite the reduced amount of research articles (about 3150 articles, approximately 1/3 the number available about low back pain or stroke) it is the most represented group of reviews.

The Cochrane Database appears as a useful tool, especially for clinicians, who usually need reliable and up-to-date information on specific topics. The availability of umbrella reviews also in the rehabilitation field will greatly improve what today appears to be a promising help in the challenge of best clinical practice.

Conclusions

Today, the Cochrane Collaboration serves as an important step in promoting rehabilitation and an evidence-based approach to medicine. Europa Medicophysica is continuously increasing its importance and presence in the world of physical and rehabilitation medicine, and one part of its mission is increasing and strengthening an evidence-based approach to this field.152 This is why we are looking with increasing interest at the Cochrane Collaboration, and we are interested in publishing papers that constitute a journal-adapted version of its systematic meta-analysis and reviews. Moreover, we will continually look at the contents of the Cochrane database and regularly report on its updates on topics of interest for physical and rehabilitation medicine.
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APPENDIX I

Acute respiratory infections group
Chest physiotherapy for bronchiolitis in children aged 0-24 months.

Airways group
Exercise and physical therapy for asthma (5 reviews).14-18
Physical training for bronchiectasis.19
Physical therapy and pulmonary rehabilitation for BPCO (2 reviews).20, 21
Educational interventions for asthma in children.22

Back group
Exercise, manipulation, massage, multidisciplinary rehabilitation and work conditioning for neck disorders (5 reviews).23-27
Rehabilitation after lumbar disk surgery (1 review).28
Bed rest for acute low back pain (1 review).29
Multidisciplinary rehabilitation for subacute low back pain (1 review).30
Behavioural treatment and TENS for chronic low back pain (2 reviews).31, 32
Back school, traction, exercise, massage, neuroflexotherapy, spinal manipulation and heat or cold therapy for non specific low back pain (7 reviews).33-39
Patient education for low-back pain (1 review).40

Bone, joints and muscle trauma group
Rehabilitation for distal radial fractures (1 review).41
Multidisciplinary rehabilitation and mobilisation for hip fractures (2 reviews).42, 43

Exercise for anterior cruciate ligament injuries (1 review).44
Biopsychological rehabilitation for repetitive upper limb injuries (1 review).45
Rehabilitation after surgery for flexor tendon injuries in the hand (1 review).46
Prostheses following limb amputation (1 review).47

Breast cancer group
Physical therapy for lymphoedema (1 review).48
Exercise for women receiving adjuvant therapy (1 review).49

Cystic fibrosis and genetic disorders group
Chest physiotherapy and physical training for cystic fibrosis (4 reviews).50-53

Dementia and cognitive impairment group
Cognitive rehabilitation for Alzheimer disease (1 review).54
Light therapy, music therapy, reminiscence therapy, snoezelen, massage and touch, TENS, validation therapy for dementia (7 reviews).55-61

Eyes and vision group
Orientation and modality training and reading aids for people with low vision (2 reviews).62, 63

Heart group
Exercise for coronary heart disease (1 review).64
HIV/AIDS group

Aerobic exercise and progressive resistive interventions (2 reviews).65, 66

Injuries group

Pharmacological interventions for spasticity following spinal cord injury.67
Sensory stimulation for brain injured individuals in coma or vegetative state.68
Spinal injuries centre for people with acute traumatic spinal cord injuries.69
Multi-disciplinary rehabilitation for acquired brain injury in adults of working age.70
Pharmacological treatment for agitation and aggression on people with acquired brain injuries.71

Metabolic and endocrine disorder group

Exercise and Group based training for self-management strategies for type 2 diabetes mellitus (2 reviews).72, 73
Exercise for overweight or obesity.74

Movement disorder group

Botulinum toxin type A and B for cervical dystonia (4 reviews).75-78
Botulinum toxin type A for lower and upper limb spasticity in cerebral palsy (2 reviews).79, 80
Occupational therapy for Parkinson’s disease.81
Physiotherapy for Parkinson’s disease (2 reviews).82, 83
Speech and language therapy for Parkinson’s disease and cerebral palsy (3 reviews).84-86
Non-pharmacological therapies for dysphagia in Parkinson’s disease.87

Multiple sclerosis group

Anti-spasticity agents for multiple sclerosis.88
Exercise therapy, Occupational therapy for multiple sclerosis (2 reviews).89, 90
Multidisciplinary rehabilitation for adults with multiple sclerosis.91
Treatment for ataxia in multiple sclerosis.92

Musculoskeletal group

Balneotherapy, Occupational therapy, Splints and Orthosis for rheumatoid arthritis (3 reviews).93-95

Braces and orthoses, Transcutaneous electrical nerve stimulation, Therapeutic ultrasound for treating osteoarthritis of the knee (3 reviews).96-98
Continuous passive motion following total knee arthroplasty.99
Deep transverse friction massage for treating tendinitis.100
Electrical stimulation, Low level laser therapy (Classes I, II and III), Thermotherapy, Therapeutic ultrasound for the treatment of rheumatoid arthritis (4 reviews).101-104
Electromagnetic fields, Thermotherapy for the treatment of osteoarthritis (2 reviews).105, 106
Exercise for acutely hospitalised older medical patients.107
Exercise for osteoarthritis of the hip or knee.108
Exercise for preventing and treating osteoporosis in postmenopausal women.109
Exercise for treating fibromyalgia syndrome.110
Home versus center based physical activity programs in older adults.111
Intensity of exercise for the treatment of osteoarthritis.112
Multidisciplinary rehabilitation for fibromyalgia and musculoskeletal pain in working age adults.113
Orthotic devices, Shock wave therapy for lateral elbow pain (2 reviews).114, 115
Patient education for adults with rheumatoid arthritis.116
Physiotherapy interventions for ankylosing spondylitis.117
Physiotherapy interventions for shoulder pain.118
Therapeutic ultrasound for treating patellofemoral pain syndrome.119
Transcutaneous electrical nerve stimulation (TENS) for the treatment of rheumatoid arthritis in the hand.120

Neonatal group

Chest physiotherapy for preventing morbidity in babies being extubated from mechanical ventilation.121

Neuromuscular disease group

Exercise for people with peripheral neuropathy.122
Rehabilitation interventions for foot drop in neuromuscular disease.123
Strength training and aerobic exercise training for muscle disease.124
Treatment for spasticity in amyotrophic lateral sclerosis/motor neuron disease.125
Treatment for swallowing difficulties (dysphagia) in chronic muscle disease.126

Pain, palliative and supportive care group
Music for pain relief.127
Non-invasive physical treatments for chronic/recurrent headache.128
Transcutaneous electrical nerve stimulation (TENS) for chronic pain.129

Peripheral vascular diseases group
Exercise for intermittent claudication.130

Stroke group
Acupuncture for stroke rehabilitation.131
Cognitive rehabilitation for attention deficits, memory deficits, spatial neglect following stroke (3 reviews).132-134
Electrical stimulation and Supportive devices for preventing and treating post-stroke shoulder pain and subluxation (2 reviews).135, 136
Electrostimulation for promoting recovery of movement or functional ability after stroke.137
EMG biofeedback for the recovery of motor function after stroke.138
Force platform feedback for standing balance training after stroke.139
Information provision for stroke patients and their caregivers.140
Interventions for apraxia of speech following stroke.141
Interventions for dysphagia in acute stroke.142
Occupational therapy for patients with problems in activities of daily living after stroke.143
Organised inpatient (stroke unit) care for stroke.144
Physical fitness training for stroke patients.145
Physiotherapy treatment approaches for the recovery of postural control and lower limb function following stroke.146
Speech and language therapy for aphasia and dysarthria due to non-progressive brain damage (2 reviews).147, 148
Therapy-based rehabilitation services for stroke patients at home.149
Treadmill training and body weight support for walking after stroke.150