

A Cochrane systematic review of physiotherapy for pain and disability in adults with complex regional pain syndrome (CRPS)

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Epidemiology

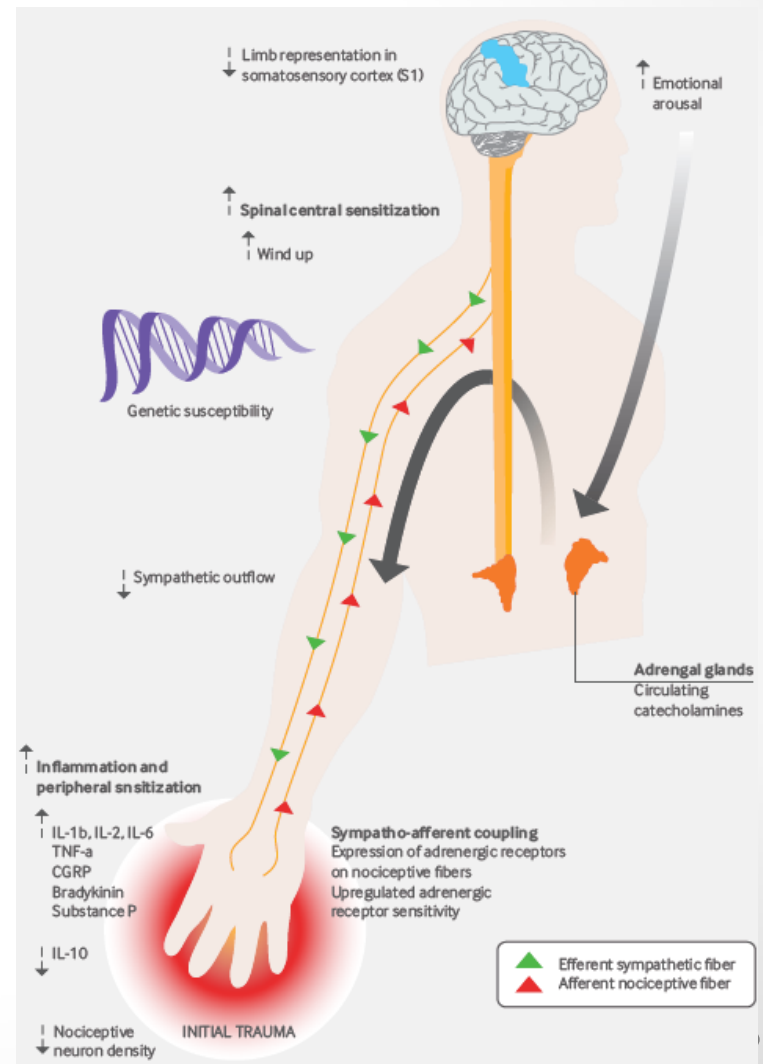
- Painful and disabling
 - Upper/lower limb
 - Acute trauma/surgery
- Types I and II
 - I (RSD, algodystrophy, Sudek's atrophy): no nerve injury
 - II (causalgia, algoneurodystrophy): co-existing nerve injury
- Incidence: 5-26 cases per 100,000 person-years
 - Ireland: ~ 200-1000 cases p.a.
 - Post injury: ~ 4-7%
- 3-4 times more prevalent in ♀ vs ♂
- Natural history:
 - Variable findings
 - Acute: ~ 75% resolution ≤ 12/12
 - Chronic: ~ 3-9 years

Epidemiology

- Risk factors
 - Genetic
 - Post #:
 - Intra-articular #
 - #-dislocation
 - Pre-existing RA
 - Pre-existing musculoskeletal co-morbidities
 - Limb immobilisation
 - Psychological traits discounted
- Impact:
 - ADLs
 - Sleep
 - Work
 - Recreation

Pathophysiology

- No single mechanism
- Maladaptive pro-inflammatory response
- Disturbances in sympathetically-mediated vasomotor control
- Maladaptive peripheral and central neuronal plasticity



Diagnosis (Budapest criteria)

Box 1 | Current International Association for the Study of Pain clinical diagnostic criteria for complex regional pain syndrome¹

- Continuing pain, which is disproportionate to any inciting event
- Must report at least one symptom in three of the four following categories*:
 - Sensory: Reports of hyperalgesia and/or allodynia
 - Vasomotor: Reports of temperature asymmetry and/or skin color changes and/or skin color asymmetry
 - Sudomotor/edema: Reports of edema and/or sweating changes and/or sweating asymmetry
 - Motor/trophic: Reports of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nails, skin)
- Must display at least one sign at time of evaluation in two or more of the following categories*:
 - Sensory: Evidence of hyperalgesia (to pinprick) and/or allodynia (to light touch or deep somatic pressure, or joint movement)
 - Vasomotor: Evidence of temperature asymmetry and/or skin color changes and/or asymmetry
 - Sudomotor/edema: Evidence of edema and/or sweating changes and/or sweating asymmetry
 - Motor/trophic: Evidence of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nails, skin)
- There is no other diagnosis that better explains the signs and symptoms

*For research settings in which it is desirable to maximize specificity, a more stringent research diagnostic decision rule requires all four of the symptom categories and at least two of the sign categories to be positive for diagnostic criteria to be met.

Presentations

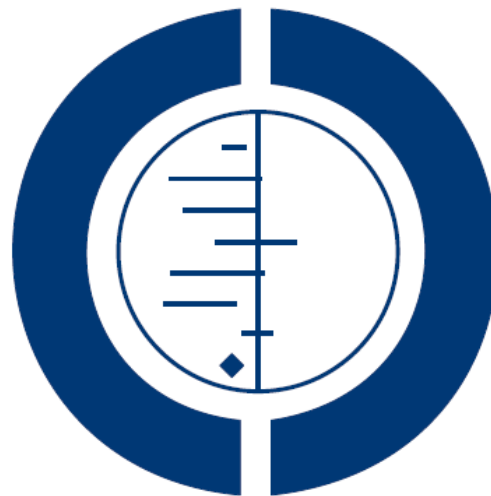


Physiotherapy

- Guideline-recommended
 - Harden 2013 (USA)
 - Goebel 2012 (London, Royal College of Physicians)
 - Perez 2010 (Dutch)
 - Stanton-Hicks 2002 (expert panel)

Physiotherapy for pain and disability in adults with complex regional pain syndrome (CRPS) types I and II (Protocol)

Smart KM, Wand BM, O'Connell NE



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Physiotherapy for pain and disability in adults with complex regional pain syndrome (CRPS) types I and II (Review)

Smart KM, Wand BM, O'Connell NE

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Physiotherapy for pain and disability in adults with complex regional pain syndrome (CRPS) types I and II.

Cochrane Database of Systematic Reviews 2016, Issue 2. Art. No.: CD010853.

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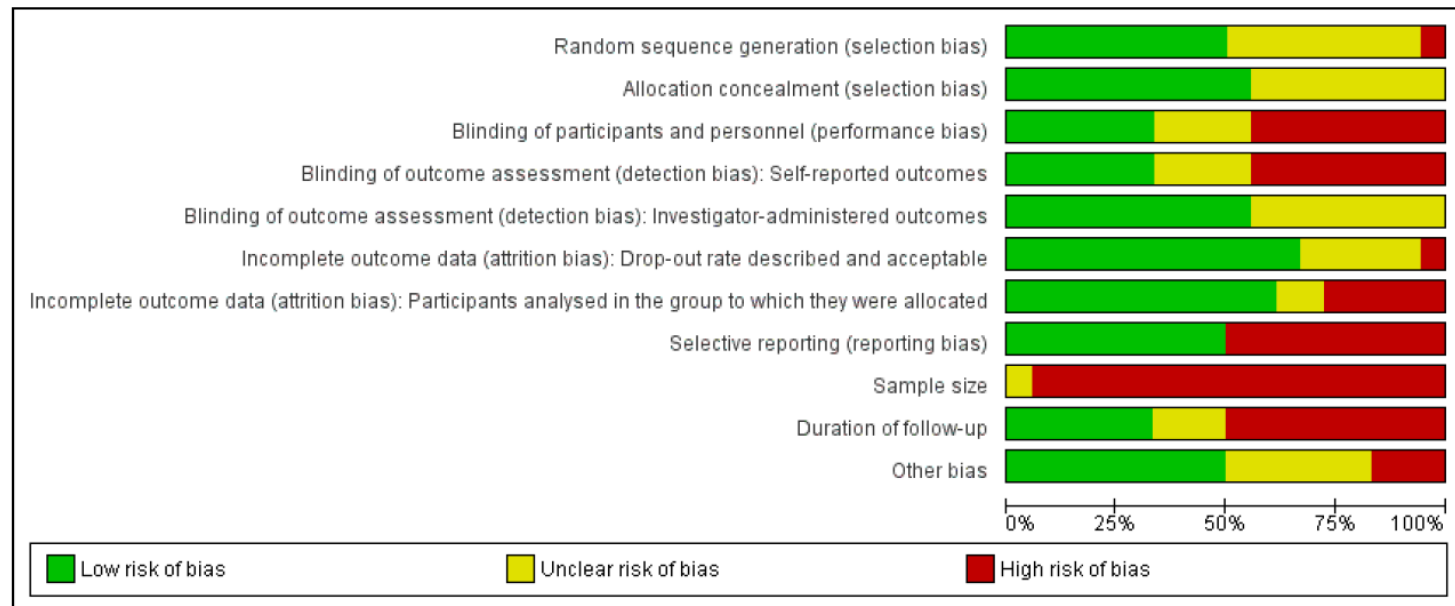
Results

- 18 trials (CRPS I)
 - 14 upper limb;
 - 2 upper/lower limb;
 - 1 lower limb;
 - 1 upper/lower/total body
- No trials with CRPS II
- n = 739 (range: 10-135)
- Various aetiologies
- 6 acute ($\leq 3/12$); 7 chronic; 2 mixed; 3 unknown
- Country:
 - Turkey (5)
 - Australia (4)
 - Italy, Germany, Netherlands (2)
 - China, Serbia, South Korea (1)
- Missing data (10 trials)
- Follow-up
 - 9 trials < 2 weeks
 - 3 trials 2-7 weeks
 - 6 trials ≥ 8 weeks
- Interventions:
 - Cortically-directed (8)
 - Multimodal physiotherapy (1)
 - Electrotherapy (6)
 - Manual lymphatic drainage (2)
 - Electro-acupuncture + massage (1)

Risk of bias

- Overall 'Risk of bias'
 - High; n = 15
 - Unclear; n = 3
- GRADE ratings
 - 'Very low' to 'low'

Figure 2. 'Risk of bias' graph: review authors' judgements about each 'Risk of bias' item presented as percentages across all included trials.



Cortically-directed

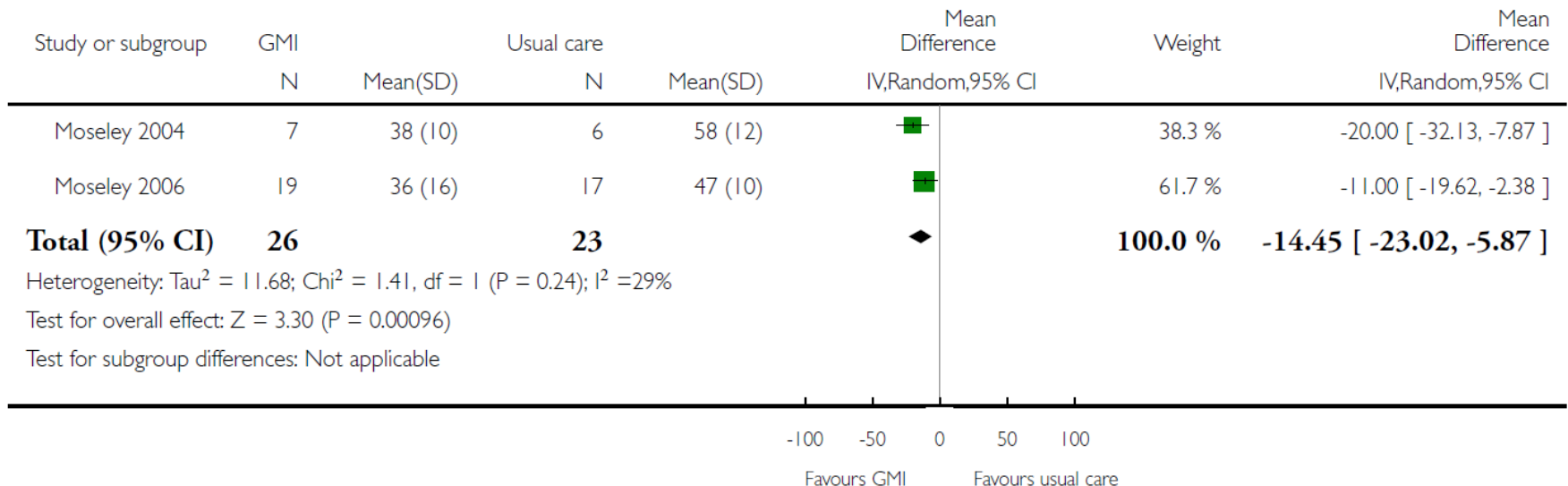
- Graded motor imagery
 - 2 trials v standard care
 - 1 trial GMI + standard care v standard care
 - 1 trial 3 different GMI Rx protocols
 - Very low quality evidence + **effect (moderate) pain, function**

Graded motor imagery

- 2 trials (Moseley 2004; 2006); 49 participants
- 0-100 pain VAS; post Rx follow-up
- WMD: - 14.45 (~ 25% reduction in pain)

Comparison: 1 Graded motor imagery versus usual care

Outcome: 1 Pain intensity (post-treatment)

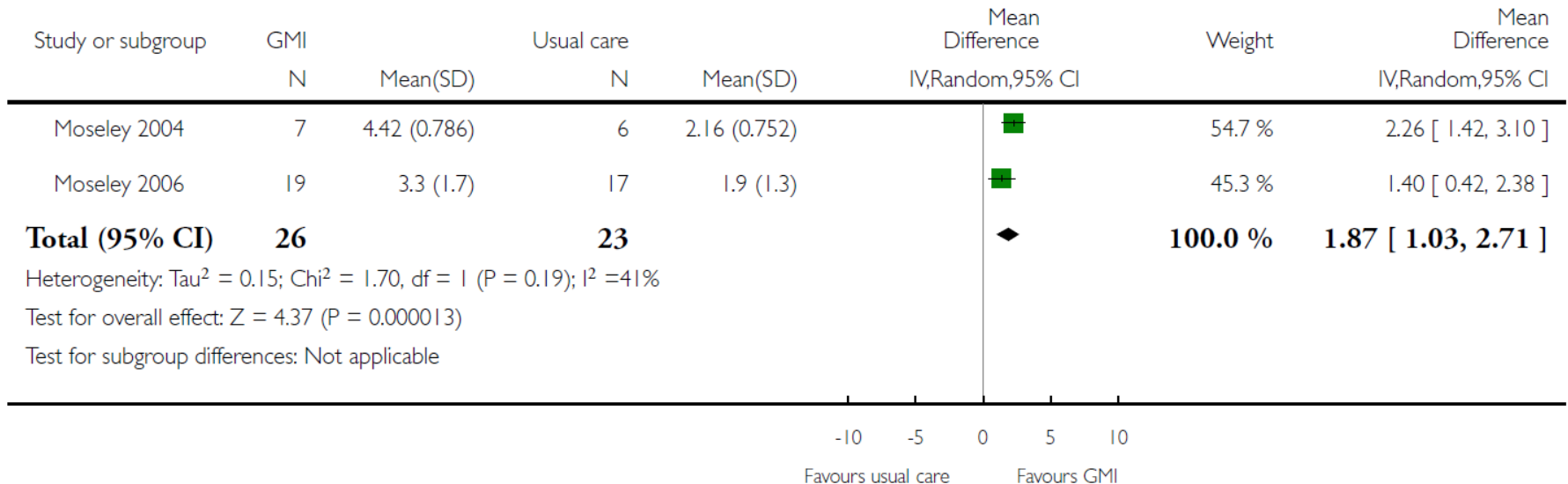


Graded motor imagery

- 0-10 function NRS; post Rx follow-up
- WMD: 1.87

Comparison: 1 Graded motor imagery versus usual care

Outcome: 2 Function (0 to 10 patient specific functional scale) (post-treatment)



Cortically-directed

- Mirror therapy (upper limb post stroke)
 - 1 trial v placebo
 - 1 trial v placebo v mental imagery
 - Very low quality evidence + **effect pain, function**
- Tactile discrimination training
 - 1 trial of 4 separate TDT protocols
 - Very low quality evidence **no effect pain**
- Virtual body swapping
 - 1 trial VBS + mental rehearsal v VBS
 - Very low quality evidence **no effect pain**

Multimodal physiotherapy

- Multimodal physiotherapy
 - 1 trial v OT v SW
 - Very low quality evidence + **(minimal) effect impairment; no effect pain**

Electrotherapy

- 2 trials US Stellate ganglion v placebo
- 1 trial US stellate ganglion v TENS
- 1 trial pulsed electromagnetic field therapy v placebo
- 1 trial laser v interferential
- 1 trial CO₂ bath therapy + exercise v exercise
- Low to Very low quality evidence **no effect pain**
-

Other

- Manual lymphatic drainage
 - 2 trials MLD v standard care
 - Low quality evidence **↯ effect pain**
- Electro-acupuncture + massage (upper limb post stroke)
 - 1 trial v rehabilitation
 - Very low quality evidence **+ effect (minimal) pain; ↯ effect function**

Update

- x 2 new RCTs (CRPS I)
 - Pain exposure physiotherapy Vs conventional treatment (Barnhoorn ,2016)
 - n = 56
 - No difference between groups in Impairment level sum score (9 month follow-up)
 - TENS + standard physical therapy Vs sham TENS + standard physical therapy (Bilgili, 2016)
 - n = 30
 - Greater reduction in pain intensity in favour of TENS (Post Rx follow-up only)

Barnhoorn et al 2015. *BMJ Open* 5:e008283.doi:10.1136/bmjopen-2015-008283

Bilgili et al 2016. *Journal of Back and Musculoskeletal Rehabilitation* (in press)

Challenges

- RCT
 - Prevalence
 - Complex intervention
 - Design
 - Parallel
 - Cross-over
 - Cluster
 - Power
 - Statistically
 - Moore (2010): ≥ 200 patients per arm
 - Follow-up
 - Reporting
 - Treatments
 - Outcomes

Conclusion

- Absence of high quality evidence
- Unable to draw any firm conclusions
- Graded motor imagery and mirror therapy may provide clinically meaningful improvements in pain and function
- Large scale, multi-centre RCTs required