National Institute for Health and Care Excellence

FINAL

Rehabilitation after traumatic injury

[C.2] Specific programmes and packages in nerve injury for people with complex rehabilitation needs after traumatic injury

NICE guideline NG211

Evidence reviews underpinning recommendations 1.16.1 to 1.16.9

January 2022

FINAL

These evidence reviews were developed by the National Guideline Alliance, which is part of the Royal College of Obstetricians and Gynaecologists

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This evidence report contains information on 2 reviews

C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Specific programmes and packages in nerve injury for people with complex rehabilitation needs after traumatic injury

Review question

This evidence report contains information on 2 reviews relating to specific rehabilitation programmes and packages for nerve injury:

C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Introduction

Peripheral nerve injury is relatively uncommon as part of a traumatic injury. However when it occurs, it can cause significant impact on a person's quality of life as it can affect both sensory and motor function, but can also be a cause of pain.

Nerves can become injured through a variety of mechanisms. Most commonly traction causes damage, but compression, crush or transection may occur. This might come about through development of haematoma in a confined space, tenting around a displaced fracture or dislocation, or laceration by a sharp bone end, or stab or ballistic injury.

Nerves can have either a conduction block, where the ability to transmit a signal is affected, but the nerve cells remain intact, or more severely, the nerve cell itself can be damaged, or worse transected. The more severe the injury the less likely spontaneous recovery will take place, and the more likely surgery will be indicated, to achieve a functional recovery.

However the nerve is treated, the recovery time can be a long process. In order to achieve a functional recovery at the end of this process it is important to avoid irreparable loss of movements of the affected joints, or develop contractures. If the joints become stiff whilst the nerves are recovering it can be difficult to regain this movement later on. Patients at particular risk of this are those who are unable to maintain their own range of movement if their other injuries inhibit their ability to undertake passive movements of the affected joints.

The objectives of these reviews were to examine what specific rehabilitation programmes and packages are effective and acceptable for people with complex rehabilitation needs after traumatic injury that involves nerve injury.

Summary of the protocol

Please see Table 1 and Table 2 for a summary of the Population, Intervention, Comparison and Outcome (PICO) characteristics of this review in the adult and children and young people populations, respectively.

Table 1: Summary of the adult protocol (PICO table)

Population	Adults (aged 18 years or above) with complex rehabilitation needs resulting from traumatic injury that involves nerve injury and requires admission to hospital
Intervention	Standard care consisting of at least 2 of the followings: physiotherapy [range of movement exercises, exercises to maintain muscle function, mobilisation and training with mobilisation aids such as crutches or frame], occupational therapy assessment, identification and support of activities of daily living through training or aids (AFO/UFO Ankle-foot orthosis and Universal foot orthosis) in addition to at least one of the following: ○ Electrical Nerve stimulation (Neuromuscular electrical stimulation and functional electrical stimulation) ○ Desensitization (physical) ○ Splinting ○ Post-surgery sensory motor cortical remapping ○ Psychological therapies for adjustment and engagement (compassionate mind therapy, acceptance and commitment therapy, mindfulness visualisation or 'mentalisation' to support physical rehab, Relaxation [progressive, or breathing based, or other], Mirror therapy, Cognitive behavioural therapy) ○ Vocational support/rehabilitation and workplace interventions (ergonomics)
Comparison	Standard care (as defined above)
Outcomes	**Critical** • Overall quality of life (EURO-QoL 5D 3L, SF-36, SF-12, SF-6D] • Changes in activity of daily living (Barthel ADL index, COPM, EADL-Test, Katz, OARS, PAT, PSMS) • Pain (VAS) • Patient acceptability (any direct measure) **Important** • Return to work or education • Changes in mood [Depression measures - HADS, PH-Q9, BDI, DAS] • Changes in mobility (any measure) • Upper limb function (DASH, ARMA)

ARMA: Arm activity measure; ADL: Activities of daily living; BDI: Beck depression inventory; DAS: Disability assessment schedule; DASH: Disabilities of the arm, shoulder and hand; EADL: Erlangen Activities of Daily Living test; EURO-QoL 5D 3L: EuroQol 5 dimensions and 3 levels; HADS: Hospital anxiety and depression scale; OARS: Older Americans resources and services; PAT: Performance ADL; PH-Q9: Patient health questionnaire with 9 questions; PSMS: Physical self-maintenance scale; SF-12: 12 item short-form survey; SF-36: 36 item short-form survey; SF-6D: 6-dimension short-form; VAS: Visual analogue scale

Table 2: Summary of the children and young people protocol (PICO table)

Population	Children and young people (aged below 18 years) with complex rehabilitation needs resulting from traumatic injury that involves nerve injury and requires admission to hospital

Intervention	Standard care consisting of at least 2 of the followings: physiotherapy [range of movement exercises, exercises to maintain muscle function, mobilisation and training with mobilisation aids such as crutches or frame], occupational therapy assessment, identification and support of activities of daily living through training or aids (AFO/UFO Ankle-foot orthosis and Universal foot orthosis) in addition to at least one of the following: o Electrical Nerve stimulation o PNF (proprioceptive neuromuscular facilitation) o Desensitization (physical) o Splinting o Post-surgery sensory motor cortical remapping o Psychological therapies for adjustment and engagement o Educational support/rehabilitation and school-based interventions Hydrotherapy o Play therapy/specialist play therapy o Theraband
Comparison	Standard care as defined above
Outcomes	**Critical** • Overall quality of life (CHQ-CF80, CHQ-PF-50, PEDS-QL, EURO-QoL 5D 3L, SF-36, SF-12, SF-6D) • Changes in activity of daily living (Barthel ADL index, COPM, EADL-Test, Katz, OARS, PAT, PSMS) • Pain (VAS, any measure) • Patient acceptability **Important** • Return to work or education • Changes in mood (Any measure, PEDS-QL, Depression measures - HADS, PH-Q9, BDI, DAS) • Changes in mobility (WeeFIM, any measure) • Upper limb function (DASH, ARMA)

Barthel ADL index: Barthel Index for Activities of Daily Living; BDI: Beck's Depression Inventory; CHQ-CF80: a self-report measure of child health questionnaires; CHQ-PF-50: a measure of child health questionnaires for parents; COPM: Canadian Occupational Performance Measure; DASS: Depression Anxiety Stress Scales; EADL-Test: Erlangen Activities of Daily Living test; EQ-5D-Y: an child-friendly EQ-5D version for measuring quality of life; HADS: Hospital Anxiety and Depression Scale; Katz: a tool to assess independence in activities of daily living; OARS: Older Americans Resources and Services; OTs: occupational therapists; PAT: Performance ADL Test; Peds-QL: Pediatric Quality of Life Inventory ;PHQ-9: Patient health questionnaire; PSMS: Physical Self-Maintenance Scale; PT: physical therapists; SF-6D: short-form six-dimension to assess the cost-effectiveness of health care interventions; SF-12: a short-form survey with 12 questionnaires selected from SF-36 to create 2 scales to assess mental and physical functioning and overall health-related quality of life; SF-36: Short form health survey-36; VAS: visual analog scale; WeeFIM: standardized measure of functional independence for use in children

For further details see the review protocols in appendix A.

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in appendix A and in the methods chapter (Supplement 1).

Declarations of interest were recorded according to NICE's 2018 conflicts of interest policy.

Clinical evidence: Adults

Included studies

5 studies were identified for this review, all randomised controlled trials (RCTs) (Hsu 2019, Paula 2016, Piccinini 2020, Rosen 2015, and Rostami 2017).

The studies were carried out in Taiwan (Hsu 2019), Brazil (Paula 2016), Italy (Piccinini 2020), Iran (Rostami 2017) or in multiple countries (Rosen 2015: Sweden, the Netherlands, and the UK).

All RCTs compared post-operative rehabilitation programmes for people with median, ulnar, peronial, radial, femoral or tibial nerve injuries. The RCTs compared the following interventions: Mirror therapy versus classical sensory re-education (Hsu 2019, Paula 2016), electrical stimulation of denervated muscles versus sham stimulation (Piccinini 2020), and an early sensory and motor re-learning regime (using mirror visual feedback and observation) versus a general rehabilitation programme (starting when re-innervation could be detected; Rosen 2015). The last included study was a 3-arm RCT, which compared the effectiveness of 2 modified constraint-induced movement interventions (i.e. occupation-based therapy, rote exercise-based therapy) to a classic rehabilitation therapy (Rostami 2017).

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

Studies not included in this review with reasons for their exclusions are provided in appendix K.

Summary of clinical studies included in the evidence review

A summary of the studies that were included in this review are presented in Table 3.

Table 3: Summary of included studies

Study	Population	Intervention[a]	Comparison[a]	Outcomes
Hsu 2019 RCT Taiwan	N=12 (11 analysed) • Age in years [Mean (SD)]: ○ Mirror therapy: 35.7 (9.3) ○ Classical sensory re-re-education: 39 (12.4) • Injured Nerve: ○ Mirror therapy (N) - Median: 4; - Ulnar: 1 ○ Classical sensory re-re-education (N) - Median: 4; - Ulnar: 1	Touch-observation and task-based mirror therapy + hand therapy + physiotherapy	Classical sensory re-re-education + hand therapy + physiotherapy	• Critical ○ None • Important ○ Upper limb function (at treatment completion and at 12 weeks)

Study	Population	Intervention[a]	Comparison[a]	Outcomes
Paula 2016 RCT Brazil	N=32 (20 analysed) • Age in years [Mean (SD)]: ○ Early sensory re-education/ mirror therapy: 24.3 (4.8) ○ Conventional: 29.6 (12.2) • Injured Nerve: ○ Early sensory re-education/ mirror therapy (N) - Median: 5; - Ulnar: 3; - Combined: 2; - Other: 0 ○ Conventional (N) - Median: 3; - Ulnar: 5; - Combined - Other: 0	Early sensory re-education program (based on mirror therapy - initiated in the 1st postoperative week).	Conventional rehabilitation therapy (initiated only 3 months after nerve repair)	• Critical ○ None • Important ○ Changes in mobility (at 3 and 6 months after nerve injury/repair ○ Upper limb function (at 3 and 6 months after nerve repair/surgery)
Piccinini 2020 RCT Italy	N=38 patients with 76 randomised muscles • Age in years [Mean (SD)]: ○ Electrical stimulation and sham (same patients): 37 (21) • Injured Nerve: ○ Electrical stimulation and sham (same patients; N): - Peronial: 23; - Ulnar: 9; - Radial: 2; - Femoral: 2 - Tibial: 1	Electrical stimulation to one muscle + traditional rehabilitation	Sham stimulation to another muscle (innervated by same injured nerve) + traditional rehabilitation	• Critical ○ None • Important ○ Upper limb function (at treatment completion and at 3 months)
Rosen 2015 RCT Sweden, The Netherlands, UK	N=37 (27 analysed) • Age in years [Median (range)]: ○ Enhanced early sensory re-education: 40 (19–63)	Enhanced early sensory re-education (consisting of mirror visual feedback-training and the observation of	Conventional rehabilitation therapy	• Critical ○ None • Important ○ Changes in mobility (at 3 and 6 months

Study	Population	Intervention[a]	Comparison[a]	Outcomes
	○ Conventional: 41 (18–69) • Injured Nerve: ○ Enhanced early sensory re-education (N) - Median: 3; - Ulnar: 12; - Combined: 0; - Other: 0 ○ Conventional (N) - Median: 6; - Ulnar: 8; - Combined: 0; - Other: 1	touch) + conventional rehabilitation therapy		after nerve repair/surgery)
Rostami 2017 RCT Iran	N=36 • Age in years [Mean (SD)]: ○ Occupation-based: 31.0 (8.0); ○ Rote-based: 39.0 (10.0); ○ Conventional: 34.0 (6.0) • Injured Nerve: ○ Occupation-based (N) - Median: 4; - Ulnar: 2; - Combined: 6; - Other: 0; ○ Rote-based 2 (N) - Median: 4; - Ulnar: 3; - Combined: 5; - Other: 0 ○ Conventional (N) - Median: 3; - Ulnar: 2; - Combined: 5; - Other: 2	Modified constraint-induced movement therapy • Occupation-based rehabilitation • Rote exercise-based rehabilitation	Conventional rehabilitation therapy	• Critical ○ Changes in activity of daily living (at 1 month) ○ Patient acceptability (at 1 month) • Important ○ Changes in mobility (at 1 month) ○ Upper limb function (at 1 month)

N: Number; SD: Standard deviation; RCT: Randomised controlled trial
(a) For full details about the intervention/comparison, please see the evidence tables in Appendix D

See the full evidence tables in appendix D. No meta-analysis was conducted (and so there are no forest plots in appendix E).

Results and quality assessment of clinical outcomes included in the evidence review

Summary of the evidence

No meta-analyses were performed as the interventions or outcomes were either not sufficiently similar to allow them to be combined or they were not reported by more than 1 study.

Of the pre-defined outcomes, evidence was found for changes in activities of daily living, patient acceptability, changes in mobility and upper limb function. There was no evidence for quality of life, pain, return to work and changes to mood.

Early sensory re-education

One RCT compared early sensory re-education (based on mirror therapy) with conventional rehabilitation (Paula 2016). There were no statistically significant or clinically important differences in mobility and upper limb function between patients who received early sensory re-education (using mirror therapy) and those who received a standard rehabilitation therapy after nerve repair at 3 or 6 months. The evidence was of very low quality.

Enhanced early sensory re-education

One RCT compared enhanced early sensory re-education (using mirror therapy combined with observation of touch) + standard rehabilitation with standard rehabilitation therapy alone (Rosen 2015). There was no statistically significant or clinically important difference in mobility between patients who received enhanced early sensory re-education (using mirror therapy combined with observation of touch) + standard rehabilitation and those who received a standard rehabilitation therapy alone after nerve repair at 3 months, however, at 6 months, enhanced early rehabilitation was associated with statistically significantly and clinically importantly better mobility than conventional rehabilitation alone. The evidence was of very low quality.

Mirror therapy

One RCT compared touch-observation and task-based mirror therapy (+ hand therapy + physiotherapy) with classical sensory re-education (+ hand therapy + physiotherapy) (Hsu 2019). There were no statistically significant or clinically important differences in upper limb function measured by the Perdue Pegbord Test (unilateral pin insertion, bilateral pin insertion, and assembly) and the Minnesota Manual Dexterity Test (placing and turning) immediately after treatment ended and 3 months later between patients who received touch-observation and task-based mirror therapy (+ hand therapy + physiotherapy; n=6) and patients who received classical sensory re-education (+ hand therapy + physiotherapy; n=5). All the evidence was very low quality.

Modified constraint-induced movement therapies

One RCT compared modified constraint-induced movement therapies (i.e., either occupation-based rehabilitation therapy or rote exercise-based rehabilitation therapy) with standard rehabilitation therapy after nerve repair (Rostami 2017). Activities of daily living, patient acceptability, mobility, and upper limb function were all statistically significantly and clinically importantly better in patients receiving modified constraint-induced movement therapies (i.e., either occupation-based rehabilitation therapy or rote exercise-based rehabilitation therapy) versus standard rehabilitation therapy after nerve repair. All the evidence was of low quality.

Electrical stimulation

One RCT compared electrical stimulation + traditional rehabilitation with sham stimulation + traditional rehabilitation (Piccinini 2020). There were no statistically significant or clinically important differences between muscles that received electrical stimulation + traditional rehabilitation and muscles that received sham stimulation + traditional rehabilitation in change in different functional/mobility outcomes (segmental muscle strength as measured by the MRC scale and dynamometry and number of sites with fibrillation potentials) from baseline, to treatment end or to 3 months after treatment end, and also no clinically important differences in the change in these outcomes between the latter 2 time points. The quality of the evidence ranged from very low to moderate.

The quality of the evidence was assessed using GRADE. See the clinical evidence profiles in appendix F.

Clinical evidence: Children and young people

Included studies

A systematic review of the clinical literature was conducted but no studies were identified which were applicable to this review question.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

No studies were identified which were applicable to this review question.

Summary of clinical studies included in the evidence review

No studies were identified which were applicable to this review question (and so there are no evidence tables in Appendix D). No meta-analysis was undertaken for this review (and so there are no forest plots in Appendix E).

Results and quality assessment of clinical outcomes included in the evidence review

Summary of the evidence

No studies were identified which were applicable to this review question.

Economic evidence: Adults and children and young people

Included studies

A systematic review of the economic literature was conducted but no economic studies were identified which were applicable to these review questions. See the study selection flow chart in appendix G.

Excluded studies

No studies were identified which were applicable to these review questions.

Summary of studies included in the economic evidence review

No economic evidence was identified which was applicable to these review questions.

Economic model

No economic modelling was undertaken for these reviews because the committee agreed that other topics were higher priorities for economic evaluation.

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

When selecting the critical and important outcomes, the committee agreed that the outcomes needed to be sufficiently generalisable to adequately capture patient-important outcomes for the whole adult and child and young people populations, respectively, which they recognised are quite large and very heterogeneous.

For both adults and children and young people, they therefore prioritised overall quality of life and activities of daily living as critical outcomes because the committee considered that one of the main aims of people with nerve injury would be to achieve similar quality of life and activity of daily living level as before the injury. Pain was also selected as a critical outcome because pain plays a pivotal role in patients' compliance with rehabilitation programmes and critically affects quality of life and the ability to undertake activities of daily living, and finally patient acceptability was also included because how acceptable a patient finds the rehabilitation intervention is likely to have a large impact in their compliance.

The committee also selected return to education or work as well as changes in mobility, and upper limb function as important outcomes as these measure the level of functional independence of the patient after traumatic injury. Changes in mood was also considered to be important because depression and post-traumatic stress disorders are common in people with traumatic injury and this outcome reflects their psychological wellbeing.

Evidence was found for activities of daily living, patient acceptability, mobility, and upper limb function in adults.

The quality of the evidence

The evidence in the pairwise comparisons was assessed using the GRADE methodology. Although the quality of the evidence across all outcomes ranged from very low to moderate, the vast majority of the results were of very low quality, and was downgraded because of design limitations of the studies and serious or very serious imprecision in the effect estimates, due to small numbers of events. Most often, design limitations in the studies were due to attrition bias arising from a high proportion of incomplete outcome data for each outcome (i.e., high rates of patients lost to follow-up and absence of intention-to-treat analysis), and unclear risk of performance bias (as it was unclear whether study participants were blinded from knowledge of which intervention they were allocated to)..

Moreover, all the included studies were small and did not cover all the target interventions and none of the studies compared the same interventions, but rather all the studies reported on different comparison or interventions. For the study providing moderate quality evidence, it was only for one aspect (segmental strength of targeted muscles) of the overall outcome (upper limb function). Taken together, this meant that the available results were uncertain and very limited and the committee were therefore unable to use them to make recommendations. Instead they made recommendations based on their experience and expertise.

Benefits and harms

There was no evidence for rehabilitation in children and young people with traumatic nerve injury. Moreover, the evidence for adults with traumatic nerve injury was very limited by primarily being of low or very low quality and also by only covering some of the interventions and outcomes of interest. The committee therefore did not use the evidence to make recommendations, which were instead all based on the expertise and experience of the committee, and most of the recommendations relate to all people, including children and young people.

The committee discussed how nerve injuries can be missed in patients with multiple injuries for a number of reasons:

- More obvious injuries can distract the patient and clinicians from recognising more subtle injuries such as nerve injury
- Nerve injuries particularly are missed in patients as the diagnosis is a clinical one because nerve injuries cannot be seen on standard trauma scans.
- If the patient is unconscious it is not possible to examine the nerve.
- If the limb is splinted, then it is difficult to examine the function of the nerve.
- In the presence of previous neurological deficit it can be easy to assume the deficit due to nerve injury was already there previously

They therefore agreed that if someone has multiple traumatic injuries, it is very important for the healthcare professionals to be aware of potential nerve injuries to ensure that the person is offered the most appropriate patient-centred rehabilitation pathway as such injuries may be hidden, especially in the presence of specific conditions such as cognitive impairments, head injuries, intensive care, complex fractures or other neurological conditions. The committee discussed that in patients with suspected nerve injury the peripheral nerve of the affected limb needs to be assessed, in order to identify the involved nerve and to define the functional deficit. They highlighted the need to be aware of the risk to tissue viability if there is sensory or motor loss secondary to peripheral nerve injury in order to be able to manage the risk and not jeopardise the person's functional recovery.

Patients whose nerves are not working lose the normal movements, which leads to the joint resting in an unnatural position and to a fixed deformity that occurs because of contracture of the capsule and muscle, and this is difficult to correct once established. The committee therefore agreed that rehabilitation therapy that focuses on maintaining the range of movement and regaining function should be offered to patients from the time they are diagnosed with nerve injury because such therapy will help prevent the loss of range of movement, avoid muscle contracture and preserve function. They further highlighted that this rehabilitation may include splinting exercise, because these are all commonly used treatments that can easily be adapted based on progress of recovery, which can be variable. In addition to these therapeutic options, hydrotherapy and sensory interventions including mirror therapy, electrical stimulation and hand therapy should also be considered because they can all play a part in stimulating and aiding functional recovery as the nerve recovers, for

example by helping to allow movement in weak muscles by reducing the effects of gravity in the case of hydrotherapy. Adequate analgesia is important in recovering nerves to allow the progress with regaining movement and functional and vocational therapy will help the person to return to their usual activities of daily living, such as work or education while recovery is ongoing because recovery can take a long time. The committee also agreed that the recovery of the nerve needs to be regularly assessed and the programme of therapy reviewed in response to these assessments in order to promote optimal functional recovery.

The committee discussed that nerve injuries can be complex and sometimes need additional specialist input or nerve conduction studies to further examine them. The committee agreed that specialist input may be required for people with nerve injuries not showing any signs of recovery or who were unlikely to recover following nerve conduction studies in order to assess other options for functional recovery, and they therefore recommended referral to a specialist peripheral nerve injury service in those cases. Some patients may benefit from surgical interventions such as nerve repair, muscle reinnervation or tendon transfers, and so suitable candidates for surgical intervention should be considered for referral. The committee recognised that patients recovering from nerve injury could experience emotional symptoms (such as low moods, anxiety and lack of motivation) due to prolonged periods of recovery marked by uncertainty about long term prognosis, and that it is very important to be aware of this as this may impact on the rehabilitation engagement and outcomes.

Finally, the committee noted that for some people with nerve injury, psychological support or specialist psychological input may be needed because of difficulties associated with the sometimes initially hidden injury and associated prolonged diagnostic process, the variable and sometimes uncertain prognostic outlook, and the long recovery time, which in combination with other injuries and rehabilitation needs can be challenging to negotiate. The committee agreed that not everyone with nerve injury will need psychological support, however, they wanted to ensure that it is considered for the minority of people who would benefit from it.

Despite the limited evidence for these review questions, the committee decided not to make a research recommendation in this area. The committee discussed that, in their clinical experience, no intervention discussed had evidence of either significant harms or significant benefits. They therefore decided to prioritise other research areas where new evidence might allow new recommendations to be made or existing recommendations to be strengthened.

Cost effectiveness and resource use

There was no existing economic evidence for these reviews.

The recommendations about the monitoring and follow-up of people with a potential nerve injury reflect current practice and will not increase consultations.

Clinicians undertake peripheral nerve assessments in all cases with suspected nerve injury, and recommendations will not result in additional resource use.

The recommended interventions to avoid loss of movement range are currently used across the health service and would not incur additional resources. The exact interventions used will depend on individual needs and were deemed essential in ensuring rehabilitation success.

Nerve conduction studies may take 15 minutes to 1 hour, depending on how many nerves and muscles a clinician will test. The recommendation in this area may result in more nerve conduction studies. A conventional nerve conduction study's unit cost is £199 (National Schedule of NHS Costs Year: 2018-19, AA33C). The committee explained that nerve conduction studies are justified in the absence of any recovery and could better identify health needs / subsequent nerve injury treatment at an earlier stage before individuals require resource-intensive management. There was no clinical evidence identified on this, and the committee made recommendations based on their expert opinion.

Sensory interventions (including mirror therapy, electrical stimulation and hand therapy) and hydrotherapy are not widely available, and this could have some resource implications for services. The committee explained that mirror therapy is relatively cheap and easy to implement. Similarly, equipment to deliver electrical stimulation is relatively inexpensive and, once acquired, could be re-used on many people. Hand therapy would involve an occupational therapist or physiotherapist providing advice regarding exercise and care. Hydrotherapy involves exercises carried out in the water and requires specialist facilities. This would involve referring to a service (e.g. within a trauma network) that has such facilities. The committee was of the view that the benefits of providing the above would outweigh any additional costs. For example, all of the above interventions can play a part in stimulating and aiding functional recovery, for example, by helping to allow movement in weak muscles by reducing the effects of gravity in the case of hydrotherapy. Similarly, low-cost mirror therapy can improve movement in affected limbs and improve activities of daily living. This can lead to a quicker recovery, help with pain management, and improve the overall quality of life and well-being.

The recommended options for inclusion in a patient - centred therapy package for people showing signs of nerve recovery are currently used across the health service and would not incur additional resources. The exact interventions used will depend on individual needs and were deemed essential in ensuring rehabilitation success.

Discussing occupational priorities with a patient may require additional consultation time. However, the committee noted that this is done across most rehabilitation centres and would have only modest resource implications, if any.

The committee explained that the recommendation for people with a poor prognosis for recovery might result in more referrals to the specialist peripheral nerve injury service. However, the committee believed that this was justified and was deemed essential, given that these individuals have not responded to conventional rehabilitation. The committee also noted that this represents current care pathways across many units, and this recommendation will not incur additional resources.

Recommendations supported by this evidence review

This evidence review supports recommendations 1.16.1 to 1.16.9 in the NICE guideline.

References

Evidence for adults

Hsu 2019

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Rostami 2017

Rostami, Hamid Reza, Akbarfahimi, Malahat, Hassani Mehraban, Afsoon, Akbarinia, Ali Reza, Samani, Susan, Occupation-based intervention versus rote exercise in modified constraint-induced movement therapy for patients with median and ulnar nerve injuries: a randomized controlled trial, Clinical rehabilitation, 31, 1087-1097, 2017

Evidence for children and young people

A systematic review of the literature was conducted but no studies were identified which were applicable to this review question.

Appendices

Appendix A – Review protocols

Review protocol for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Table 4: Review protocol for specific programmes and packages in nerve injury for adults

Field	Content
PROSPERO registration number	CRD42019123912
Review title	Specific programmes and packages in nerve injury for adults
Review question	For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?
Objective	To evaluate the effectiveness of specific rehabilitation programmes and packages among adults with complex rehabilitation needs after traumatic injury that involves nerve injury
Searches	Sources to be searched: Medline, Medline In-Process, CCTR, CDSR, Embase. Limits (e.g. date, study design): All study designs. Apply standard animal/non-English language filters. Date limited to 1995 onwards as there has been significant change in practice since then. Supplementary search techniques: No supplementary search techniques were used. See appendix F for full strategies.
Condition or domain being studied	Complex rehabilitation needs resulting from traumatic injury 'Complex rehab needs' refers to 'multiple needs, and will always involve coordinated multidisciplinary input from 2 or more allied health professional disciplines, and also include the following: • Vocational or educational social support for the person to return to their pervious functional level, including return to work, school or college • Emotional, psychological and psychosocial support • Equipment or adaptations • Ongoing recovery from injury that may change the person's rehabilitation needs (for example, restrictions of weight bearing, cast immobilisation in feature clinic)Further surgery and readmissions to hospital

Field	Content
	Traumatic injury is defined as 'traumatic injury as injury that requires admission to hospital at the time of injury.'
Population	Inclusion: • Adults (aged 18 years or above) with complex rehabilitation needs resulting from traumatic injury that involves nerve injury and requires admission to hospital Exclusion: • Adults with complex rehabilitation needs resulting from traumatic brain injury (including anoxic brain injury, for example, drowning and strangulation) • Adults with traumatic injuries who do not have complex rehabilitation needs and/or do not require admission to hospital • Adults with complex rehabilitation needs resulting from traumatic injury that involves nerve injury who are admitted to the ICU
Intervention	Standard care consisting of at least 2 of the followings: physiotherapy [range of movement exercises, exercises to maintain muscle function, mobilisation and training with mobilisation aids such as crutches or frame], occupational therapy assessment, identification and support of activities of daily living through training or aids (AFO/UFO Ankle-foot orthosis and Universal foot orthosis) in addition to at least one of the following • Electrical Nerve stimulation (Neuromuscular electrical stimulation and functional electrical stimulation) • Desensitization (physical) • Splinting • Post-surgery sensory motor cortical remapping • Psychological therapies for adjustment and engagement (compassionate mind therapy, acceptance and commitment therapy, mindfulness visualisation or 'mentalisation' to support physical rehab, Relaxation [progressive, or breathing based, or other], Mirror therapy, Cognitive behavioural therapy) • Vocational support/rehabilitation and workplace interventions (ergonomics) Exclusion: • Rehabilitation packages and programmes relating to traumatic brain injury, sight loss and hearing loss • Social care interventions (for example, home care or personal assistance) • Long-term care and rehabilitation packages for people with long-term care needs • Specific pain management interventions
Comparator/Reference standard/Confounding factors	1) Standard care consisting of at least 2 of the followings: physiotherapy [range of movement exercises, exercises to maintain muscle function, mobilisation and training with mobilisation aids such as crutches or frame], occupational therapy assessment, identification and support of activities of daily living through training or aids (AFO/UFO Ankle-foot orthosis and Universal foot orthosis)

Field	Content
	2) Studies that employ the same intervention program as listed under 'interventions' but vary it in terms of any of the following: • Frequency • Intensity Timing
Types of study to be included	• Systematic review of RCTs • Randomised controlled trial If no RCT data are available for an intervention, evidence from the followings will be considered in order • Cluster-randomised trial • Systematic review of non-randomised studies • Comparative prospective cohort studies with N≥100 per treatment arm • Comparative retrospective cohort studies with N≥100 per treatment arm
Other exclusion criteria	Study design: • Cross-over design • Case-controls • Cross-sectional • Case series and case reports • Audits Language: • Non-English Publication status: • Abstract only
Context	Inclusion: • All inpatient, outpatient and community settings in which rehabilitation services following traumatic injury are provided Exclusion: • Accident and emergency departments

Field	Content
	• Critical care units • Prisons
Primary outcomes (critical outcomes)	Critical: • Overall quality of life (EURO-QoL 5D 3L, SF-36, SF-12, SF-6D) • Changes in activity of daily living (Barthel ADL index, COPM, EADL-Test, Katz, OARS, PAT, PSMS) • Pain (VAS) • Patient acceptability (any direct measure) Timeframe for the follow-up will be 6-18 months. This will be grouped into short-term (0-6 months) and long-term (more than 6 months).
Secondary outcomes (important outcomes)	Important: • Return to work or education • Changes in mood [Depression measures – HADS, PH-Q9, BDI, DAS] • Changes in mobility (any measure) • Upper limb function (DASH, ARMA) Timeframe for the follow-up will be 6-18 months. This will be grouped into short-term (0-6 months) and long-term (more than 6 months).
Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into STAR and de-duplicated. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. A standardised form will be used to extract data from studies (see Developing NICE guidelines: the manual section 6.4.
Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual.
Strategy for data synthesis	NGA STAR software will be used for generating bibliographies/citations, study sifting and data extraction. If pairwise meta-analyses are undertaken, they will be performed using Cochrane Review Manager (RevMan). 'GRADEpro' will be used to assess the quality of evidence for each outcome. MIDs: See methods chapter of the guideline.

Field	Content
Analysis of sub-groups	No subgroups were identified for this question, but if there is heterogeneity, we will look at the following subgroups to try to identify the source of it. • Upper limb / lower limb People with pre-existing physical and/or mental health conditions (including substance misuse), physical and learning disability, or frailty • People who require safeguarding
Type and method of review	Intervention
Language	English
Country	England
Anticipated or actual start date	10/01/2019
Anticipated completion date	24/11/2020
Stage of review at time of this submission	**Review stage** / **Started** / **Completed** Preliminary searches: ☑ / ☑ Piloting of the study selection process: ☑ / ☑ Formal screening of search results against eligibility criteria: ☑ / ☑ Data extraction: ☐ / ☐ Risk of bias (quality) assessment: ☐ / ☐ Data analysis: ☐ / ☐
Named contact	National Guideline Alliance
Review team members	National Guideline Alliance
Funding sources/sponsor	This systematic review is being completed by the National Guideline Alliance which receives funding from NICE.
Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared

Field	Content
	publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/ng211/history
Other registration details	
Reference/URL for published protocol	https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42019123912
Dissemination plans	
Keywords	
Details of existing review of same topic by same authors	
Current review status	
Additional information	
Details of final publication	www.nice.org.uk

ARMA: Arm activity measure; ADL: Activities of daily living; BDI: Beck depression inventory; CCTR: Cochrane Controlled Trials Register; CDSR: Cochrane Database of Systematic Reviews; CENTRAL: Cochrane Central Register of Controlled Trials; DARE: Database of Abstracts of Reviews of Effects; DAS: Disability assessment schedule; DASH: Disabilities of the arm, shoulder and hand; EADL: Erlangen Activities of Daily Living test; EURO-QoL 5D 3L: EuroQol 5 dimensions and 3 levels; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HADS: Hospital anxiety and depression scale; ; HTA: Health Technology Assessment; ICU: intensive care unit; NGA: National Guideline Alliance; NICE: National Institute for Health and Care Excellence; NIHR: National Institute for Health Research; OARS: Older Americans resources and services; PAT: Performance ADL; PH-Q9: Patient health questionnaire with 9 questions; PSMS: Physical self-maintenance scale; RCT(s): randomised controlled trial(s); RoB: risk of bias; SF-12: 12 item short-form survey; SF-36: 36 item short-form survey; SF-6D: 6-dimension short-form; VAS: Visual analogue scale.

Review protocol for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Table 5: Review protocol for specific programmes and packages in nerve injury for children and young people

Field	Content
PROSPERO registration number	CRD42019129990
Review title	Specific programmes and packages in nerve injury for children and young people
Review question	For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?
Objective	To evaluate the effectiveness of specific rehabilitation programmes and packages among children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury
Searches	The following databases will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE Searches will be restricted by: • Date: 1995 onwards as there has been significant change in practice since then • English language • Human studies The full search strategies for MEDLINE database will be published in the final review.
Condition or domain being studied	Complex rehabilitation needs resulting from traumatic injury 'Complex rehab needs' refers to 'multiple needs, and will always involve coordinated multidisciplinary input from 2 or more allied health professional disciplines, and also include the following: • Vocational or educational social support for the person to return to their previous functional level, including return to work, school or college • Emotional, psychological and psychosocial support • Equipment or adaptations

Field	Content
	• Ongoing recovery from injury that may change the person's rehabilitation needs (for example, restrictions of weight bearing, cast immobilisation in feature clinic) • Further surgery and readmissions to hospital • Traumatic injury is defined as 'traumatic injury as injury that requires admission to hospital at the time of injury.'
Population	Inclusion: • Children and young people (aged below 18 years) with complex rehabilitation needs resulting from traumatic injury that involves nerve injury and requires admission to hospital Exclusion: • Children and young people with complex rehabilitation needs resulting from traumatic brain injury (including anoxic brain injury, for example, drowning and strangulation) • Children and young people with traumatic injuries who do not have complex rehabilitation needs and/or do not require admission to hospital • Children and young people with complex rehabilitation needs resulting from traumatic injury that involves nerve injury who are currently admitted to the PICU • Brachial plexus injury in newborn babies
Intervention	• Standard care consisting of at least 2 of the followings: physiotherapy [range of movement exercises, exercises to maintain muscle function, mobilisation and training with mobilisation aids such as crutches or frame], occupational therapy assessment, identification and support of activities of daily living through training or aids (AFO/UFO Ankle-foot orthosis and Universal foot orthosis) in addition to at least one of the following ○ Electrical Nerve stimulation (Neuromuscular electrical stimulation and functional electrical stimulation) ○ PNF (proprioceptive neuromuscular facilitation) ○ Desensitization (physical) ○ Splinting ○ Post-surgery sensory motor cortical remapping ○ Psychological therapies for adjustment and engagement (Family therapy, compassionate mind therapy, acceptance and commitment therapy, mindfulness visualisation or 'mentalisation' to support physical rehab, Relaxation [progressive, or breathing based, or other], Mirror therapy, Cognitive behavioural therapy)

Field	Content
	○ Educational support/rehabilitation and school-based interventions (ergonomics) ○ Hydrotherapy ○ Play therapy/specialist play therapy ○ Theraband (stretchy elastic that provides resistance that is widely used by OTs and PTs) Exclusion: • Rehabilitation packages and programmes relating to traumatic brain injury, sight loss and hearing loss • Social care interventions (for example, home care or personal assistance) • Long-term care and rehabilitation packages for people with long-term care needs • Specific pain management interventions
1. Comparator/Reference 2. standard/Confounding factors	1. Standard care consisting of at least 2 of the followings: physiotherapy [range of movement exercises, exercises to maintain muscle function, mobilisation and training with mobilisation aids such as crutches or frame], occupational therapy assessment, identification and support of activities of daily living through training or aids (AFO/UFO Ankle-foot orthosis and Universal foot orthosis) 2. Studies that employ the same intervention program as listed under 'interventions' but vary it in terms of any of the following: ○ Frequency ○ Intensity ○ Timing
Types of study to be included	• Systematic review of RCTs • Randomised controlled trial If no RCT data are available for an intervention, evidence from the followings will be considered in order • Cluster-randomised trial • Systematic review of non-randomised studies • Comparative prospective cohort studies with N≥100 per treatment arm • Comparative retrospective cohort studies with N≥100 per treatment arm
Other exclusion criteria	Study design:

Field	Content
	• Cross-over design • Case-controls • Cross-sectional • Case series and case reports Audits • Language: • Non-English Publication status: • Abstract only
Context	Settings - Inclusion: • All inpatient, outpatient and community settings in which rehabilitation services following traumatic injury are provided Exclusion: • Accident and emergency departments • Critical care units • Prisons
Primary outcomes (critical outcomes)	Critical: • Overall quality of life (CHQ-CF80, CHQ-PF-50, PEDS-QL, EURO-QoL 5D 3L, SF-36, SF-12, SF-6D) • Changes in activity of daily living (Barthel ADL index, COPM, EADL-Test, Katz, OARS, PAT, PSMS) • Pain (VAS, any measure) • Patient acceptability (any direct measure; if not reported, but patient satisfaction is, this will be reported instead) Timeframe for the follow-up will be 0-18 months. This will be grouped into short-term (0-6 months) and long-term (more than 6 months).
Secondary outcomes (important outcomes)	Important: • Return to work or education • Changes in mood (Any measure, PEDS-QL, Depression measures – HADS, PH-Q9, BDI, DAS)

Field	Content
	• Changes in mobility (WeeFIM, any measure) • Upper limb function (DASH, ARMA) Timeframe for the follow-up will be 0-18 months. This will be grouped into short-term (0-6 months) and long-term (more than 6 months).
Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into STAR and de-duplicated. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. A standardised form will be used to extract data from studies (see Developing NICE guidelines: the manual section 6.4.
Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual.
Strategy for data synthesis	• NGA STAR software will be used for generating bibliographies/citations, study sifting and data extraction. • If pairwise meta-analyses are undertaken, they will be performed using Cochrane Review Manager (RevMan). • 'GRADEpro' will be used to assess the quality of evidence for each outcome.
Analysis of sub-groups	• No subgroups were specified for this question for stratification of the data, but if there is heterogeneity, we will look at the following subgroups to try to identify the source of it. • Upper limb versus lower limb • Children and young people with pre-existing physical and/or mental health conditions (including substance misuse), physical and learning disability, or prematurity versus no pre-existing conditions • Children and young people who are suspected of sustaining non-accidental injuries versus accidental injuries • Children and young people whose parents are very involved in their rehabilitation/recovery (e.g., by staying overnight in hospital) versus not involved • Age (0-3 versus 4-7 versus 8-12 versus 13-17) •
Type and method of review	Intervention
Language	English
Country	England

Field	Content
Anticipated or actual start date	10/01/2019
Anticipated completion date	24/11/2020
Stage of review at time of this submission	**Review stage** / **Started** / **Completed** Preliminary searches ☑ ☑ Piloting of the study selection process ☑ ☑ Formal screening of search results against eligibility criteria ☑ ☑ Data extraction ☐ ☐ Risk of bias (quality) assessment ☐ ☐ Data analysis ☐ ☐
Named contact	National Guideline Alliance
Review team members	National Guideline Alliance
Funding sources/sponsor	This systematic review is being completed by the National Guideline Alliance which receives funding from NICE.
Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be

Field	Content
	recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/ng211/history
Other registration details	
Reference/URL for published protocol	https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42019123912
Dissemination plans	
Keywords	
Details of existing review of same topic by same authors	
Current review status	
Additional information	
Details of final publication	www.nice.org.uk

ARMA: Arm activity measure; ADL: Activities of daily living; BDI: Beck depression inventory; CCTR: Cochrane Controlled Trials Register; CDSR: Cochrane Database of Systematic Reviews; CENTRAL: Cochrane Central Register of Controlled Trials; DARE: Database of Abstracts of Reviews of Effects; DAS: Disability assessment schedule; DASH: Disabilities of the arm, shoulder and hand; EADL: Erlangen Activities of Daily Living test; EURO-QoL 5D 3L: EuroQol 5 dimensions and 3 levels; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HADS: Hospital anxiety and depression scale; HTA: Health Technology Assessment; ICU: intensive care unit; NGA: National Guideline Alliance; NICE: National Institute for Health and Care Excellence; NIHR: National Institute for Health Research; OARS: Older Americans resources and services; PAT: Performance ADL; PH-Q9: Patient health questionnaire with 9 questions; PSMS: Physical self-maintenance scale; RCT(s): randomised controlled trial(s); RoB: risk of bias; SF-12: 12 item short-form survey; SF-36: 36 item short-form survey; SF-6D: 6-dimension short-form; VAS: Visual analogue scale.

Appendix B – Literature search strategies

Literature search strategies for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Note the searches for this review question were re-run on 12/11/2020 but with a randomized controlled trial search filter added. This was in order to capture any high level evidence published since the original search was run on 08/01/2019.

Review question search strategies

Databases: Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

#	Searches
1	PERIPHERAL NERVE INJURIES/
2	exp CRANIAL NERVE INJURIES/
3	exp PERIPHERAL NERVOUS SYSTEM/in [Injuries]
4	exp COMPLEX REGIONAL PAIN SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
5	exp NERVE COMPRESSION SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
6	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
7	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
8	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
9	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
10	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
11	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
12	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
13	or/1-12
14	ELECTRIC STIMULATION THERAPY/
15	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
16	NMES.ti,ab.
17	FES.ti,ab.
18	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.
19	SPLINTS/
20	exp ORTHOTIC DEVICES/
21	splint$.ti,ab.
22	orthos?s.ti,ab.
23	orthotic?.ti,ab.
24	brace?.ti,ab.
25	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
26	"ACCEPTANCE AND COMMITMENT THERAPY"/
27	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
28	MINDFULNESS/
29	Mindfulness.ti,ab.
30	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
31	mentali?ation.ti,ab.
32	RELAXATION THERAPY/
33	BREATHING EXERCISES/
34	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.
35	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
36	COGNITIVE THERAPY/
37	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
38	CBT.ti,ab.
39	REHABILITATION, VOCATIONAL/
40	(EMPLOYMENT/ or EMPLOYMENT, SUPPORTED/ or WORKPLACE/) and (ADAPTATION, PHYSIOLOGICAL/ or ACCLIMATIZATION/ or exp ADAPTATION, PSYCHOLOGICAL/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF-HELP DEVICES/)
41	((vocation$ or work$ or job? or employment or employee? or profession? or occupation?) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
42	RETURN TO WORK/
43	(return$ adj3 work$).ti,ab.

#	Searches
44	VOCATIONAL GUIDANCE/
45	((vocation$ or work$ or job? or employment or employee? or profession? or occupation? or career?) adj5 (guid$ or counsel$)).ti,ab.
46	MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
47	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
48	or/14-47
49	13 and 48
50	limit 49 to english language
51	limit 50 to yr="1995 -Current"
52	LETTER/
53	EDITORIAL/
54	NEWS/
55	exp HISTORICAL ARTICLE/
56	ANECDOTES AS TOPIC/
57	COMMENT/
58	CASE REPORT/
59	(letter or comment*).ti.
60	or/52-59
61	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
62	60 not 61
63	ANIMALS/ not HUMANS/
64	exp ANIMALS, LABORATORY/
65	exp ANIMAL EXPERIMENTATION/
66	exp MODELS, ANIMAL/
67	exp RODENTIA/
68	(rat or rats or mouse or mice).ti.
69	or/62-68
70	51 not 69

Databases: Embase; and Embase Classic

#	Searches
1	exp NERVE INJURY/
2	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
3	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
4	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
5	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
6	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
7	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
8	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
9	or/1-8
10	ELECTROTHERAPY/
11	*NERVE STIMULATION/
12	FUNCTIONAL ELECTRICAL STIMULATION/
13	NEUROMUSCULAR ELECTRICAL STIMULATION/
14	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
15	NMES.ti,ab.
16	FES.ti,ab.
17	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.
18	exp ORTHOSIS/
19	splint$.ti,ab.
20	orthos?s.ti,ab.
21	orthotic?.ti,ab.
22	brace?.ti,ab.
23	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
24	"ACCEPTANCE AND COMMITMENT THERAPY"/
25	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
26	MINDFULNESS/
27	Mindfulness.ti,ab.
28	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
29	mentali?ation.ti,ab.
30	RELAXATION TRAINING/
31	BREATHING EXERCISE/
32	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.
33	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
34	COGNITIVE BEHAVIORAL THERAPY/

#	Searches
35	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
36	CBT.ti,ab.
37	VOCATIONAL REHABILITATION/
38	JOB ADAPTATION/
39	(exp EMPLOYMENT/ or WORKPLACE/) and (ADAPTATION/ or ACCLIMATIZATION/ or exp COPING BEHAVIOR/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF HELP DEVICE/ or ASSISTIVE TECHNOLOGY DEVICE/)
40	((vocation$ or work$ or job? or employment or employee? or profession? or occupation?) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
41	RETURN TO WORK/
42	WORK RESUMPTION/
43	(return$ adj3 work$).ti,ab.
44	VOCATIONAL GUIDANCE/
45	((vocation$ or work$ or job? or employment or employee? or profession? or occupation? or career?) adj5 (guid$ or counsel$)).ti,ab.
46	exp MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
47	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
48	or/10-47
49	9 and 48
50	limit 49 to english language
51	limit 50 to yr="1995 -Current"
52	letter.pt. or LETTER/
53	note.pt.
54	editorial.pt.
55	CASE REPORT/ or CASE STUDY/
56	(letter or comment*).ti.
57	or/52-56
58	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
59	57 not 58
60	ANIMAL/ not HUMAN/
61	NONHUMAN/
62	exp ANIMAL EXPERIMENT/
63	exp EXPERIMENTAL ANIMAL/
64	ANIMAL MODEL/
65	exp RODENT/
66	(rat or rats or mouse or mice).ti.
67	or/59-66
68	51 not 67

Databases: Cochrane Central Register of Controlled Trials; and Cochrane Database of Systematic Reviews

#	Searches
#1	[mh ^"PERIPHERAL NERVE INJURIES"]
#2	[mh "CRANIAL NERVE INJURIES"]
#3	[mh "PERIPHERAL NERVOUS SYSTEM"/IN]
#4	[mh "COMPLEX REGIONAL PAIN SYNDROMES"]
#5	[mh "NERVE COMPRESSION SYNDROMES"]
#6	#4 or #5
#7	(injur* or damag* or lesion* or trauma*):ti,ab
#8	#6 and #7
#9	(nerve* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#10	("nervous tissue*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#11	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) near/3 plexus near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#12	("complex regional* pain syndrome*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#13	(causalgia near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#14	("reflex sympathetic dystroph*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#15	(("carpal tunnel" or "piriformis muscle*" or "tarsal tunnel" or "thoracic outlet" or "cervical rib*" or "cubital tunnel") near/3 syndrome* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#16	#1 or #2 or #3 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15
#17	[mh ^"ELECTRIC STIMULATION THERAPY"]
#18	(electr* near/5 (nerve* or neuro* or muscl* or function*) near/5 stimulat*):ti,ab
#19	NMES:ti,ab
#20	FES:ti,ab
#21	((desensiti* or "de-sensiti*" or hyposensiti* or "hypo-sensiti*" or hypersensiti* or "hyper-sensiti*") near/5 (therap* or program* or train* or technique* or strateg* or condition* or progress* or massag* or textur* or velvet or velcro or cloth* or moleskin* or "mole skin*" or towel* or touch* or immersi*)):ti,ab
#22	[mh ^SPLINTS]
#23	[mh ^"ORTHOTIC DEVICES"]

#	Searches
#24	splint*:ti,ab
#25	orthosis:ti,ab
#26	orthoses:ti,ab
#27	orthotic*:ti,ab
#28	brace*:ti,ab
#29	(Compassion* near/3 mind* near/3 (therap* or train*)):ti,ab
#30	[mh ^"ACCEPTANCE AND COMMITMENT THERAPY"]
#31	(Accept* near/3 commit* near/3 (therap* or train*)):ti,ab
#32	[mh ^MINDFULNESS]
#33	Mindfulness:ti,ab
#34	(Visualization near/3 (therap* or train*)):ti,ab
#35	(Visualisation near/3 (therap* or train*)):ti,ab
#36	mentalization:ti,ab
#37	mentalisation:ti,ab
#38	[mh ^"RELAXATION THERAPY"]
#39	[mh ^"BREATHING EXERCISES"]
#40	((Relax* or progressive* or breath*) near/3 (therap* or train* or exercis*)):ti,ab
#41	(Mirror* near/3 (therap* or train* or feedback)):ti,ab
#42	[mh ^"COGNITIVE THERAPY"]
#43	(Cognit* near/3 behav* near/3 (therap* or train*)):ti,ab
#44	CBT:ti,ab
#45	[mh ^"REHABILITATION, VOCATIONAL"]
#46	[mh ^EMPLOYMENT]
#47	[mh ^"EMPLOYMENT, SUPPORTED"]
#48	[mh ^WORKPLACE]
#49	#46 or #47 or #48
#50	[mh ^"ADAPTATION, PHYSIOLOGICAL"]
#51	[mh ^ACCLIMATIZATION]
#52	[mh "ADAPTATION, PSYCHOLOGICAL"]
#53	[mh ^ERGONOMICS]
#54	[mh ^"EQUIPMENT DESIGN"]
#55	[mh ^"SELF-HELP DEVICES"]
#56	#50 or #51 or #52 or #53 or #54 or #55
#57	#49 and #56
#58	((vocation* or work* or job* or employment or employee* or profession* or occupation*) near/5 (rehab* or support* or adjust* or adapt* or chang* or reintegrat* or "re-integrat*" or facilitat* or intervention* or equipment or ergonomic* or "assist* tech*")):ti,ab
#59	[mh ^"RETURN TO WORK"]
#60	(return* near/3 work*):ti,ab
#61	[mh ^"VOCATIONAL GUIDANCE"]
#62	((vocation* or work* or job* or employment or employee* or profession* or occupation* or career*) near/5 (guid* or counsel*)):ti,ab
#63	[mh ^"MOTOR CORTEX"]
#64	(remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*):ti,ab
#65	#63 and #64
#66	((sens* or somato* or motor*) near/5 cort* near/5 (remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*)):ti,ab
#67	#17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44 or #45 or #57 or #58 or #59 or #60 or #61 or #62 or #65 or #66
#68	#16 and #67 with Publication Year from 1995 to 2019, in Trials
#69	#16 and #67 with Cochrane Library publication date Between Jan 1995 and Jan 2019, in Cochrane Reviews, Cochrane Protocols

Health economics search strategies

Databases: Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

#	Searches
1	ECONOMICS/
2	VALUE OF LIFE/
3	exp "COSTS AND COST ANALYSIS"/
4	exp ECONOMICS, HOSPITAL/
5	exp ECONOMICS, MEDICAL/
6	exp RESOURCE ALLOCATION/
7	ECONOMICS, NURSING/
8	ECONOMICS, PHARMACEUTICAL/
9	exp "FEES AND CHARGES"/
10	exp BUDGETS/

#	Searches
11	budget*.ti,ab.
12	cost*.ti,ab.
13	(economic* or pharmaco?economic*).ti,ab.
14	(price* or pricing*).ti,ab.
15	(financ* or fee or fees or expenditure* or saving*).ti,ab.
16	(value adj2 (money or monetary)).ti,ab.
17	resourc* allocat*.ti,ab.
18	(fund or funds or funding* or funded).ti,ab.
19	(ration or rations or rationing* or rationed).ti,ab.
20	ec.fs.
21	or/1-20
22	PERIPHERAL NERVE INJURIES/
23	exp CRANIAL NERVE INJURIES/
24	exp PERIPHERAL NERVOUS SYSTEM/in [Injuries]
25	exp COMPLEX REGIONAL PAIN SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
26	exp NERVE COMPRESSION SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
27	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
28	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
29	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
30	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
31	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
32	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
33	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
34	or/22-33
35	ELECTRIC STIMULATION THERAPY/
36	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
37	NMES.ti,ab.
38	FES.ti,ab.
39	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.
40	SPLINTS/
41	exp ORTHOTIC DEVICES/
42	splint$.ti,ab.
43	orthos?s.ti,ab.
44	orthotic?.ti,ab.
45	brace?.ti,ab.
46	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
47	"ACCEPTANCE AND COMMITMENT THERAPY"/
48	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
49	MINDFULNESS/
50	Mindfulness.ti,ab.
51	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
52	mentali?ation.ti,ab.
53	RELAXATION THERAPY/
54	BREATHING EXERCISES/
55	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.
56	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
57	COGNITIVE THERAPY/
58	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
59	CBT.ti,ab.
60	REHABILITATION, VOCATIONAL/
61	(EMPLOYMENT/ or EMPLOYMENT, SUPPORTED/ or WORKPLACE/) and (ADAPTATION, PHYSIOLOGICAL/ or ACCLIMATIZATION/ or exp ADAPTATION, PSYCHOLOGICAL/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF-HELP DEVICES/)
62	((vocation$ or work$ or job? or employment or employee? or profession? or occupation?) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
63	RETURN TO WORK/
64	(return$ adj3 work$).ti,ab.
65	VOCATIONAL GUIDANCE/
66	((vocation$ or work$ or job? or employment or employee? or profession? or occupation? or career?) adj5 (guid$ or counsel$)).ti,ab.
67	MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
68	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
69	or/35-68
70	34 and 69

#	Searches
71	limit 70 to english language
72	limit 71 to yr="1995 -Current"
73	LETTER/
74	EDITORIAL/
75	NEWS/
76	exp HISTORICAL ARTICLE/
77	ANECDOTES AS TOPIC/
78	COMMENT/
79	CASE REPORT/
80	(letter or comment*).ti.
81	or/73-80
82	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
83	81 not 82
84	ANIMALS/ not HUMANS/
85	exp ANIMALS, LABORATORY/
86	exp ANIMAL EXPERIMENTATION/
87	exp MODELS, ANIMAL/
88	exp RODENTIA/
89	(rat or rats or mouse or mice).ti.
90	or/83-89
91	72 not 90
92	21 and 91

Databases: Embase; and Embase Classic

#	Searches
1	HEALTH ECONOMICS/
2	exp ECONOMIC EVALUATION/
3	exp HEALTH CARE COST/
4	exp FEE/
5	BUDGET/
6	FUNDING/
7	RESOURCE ALLOCATION/
8	budget*.ti,ab.
9	cost*.ti,ab.
10	(economic* or pharmaco?economic*).ti,ab.
11	(price* or pricing*).ti,ab.
12	(financ* or fee or fees or expenditure* or saving*).ti,ab.
13	(value adj2 (money or monetary)).ti,ab.
14	resourc* allocat*.ti,ab.
15	(fund or funds or funding* or funded).ti,ab.
16	(ration or rations or rationing* or rationed).ti,ab.
17	or/1-16
18	exp NERVE INJURY/
19	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
20	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
21	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
22	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
23	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
24	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
25	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
26	or/18-25
27	ELECTROTHERAPY/
28	*NERVE STIMULATION/
29	FUNCTIONAL ELECTRICAL STIMULATION/
30	NEUROMUSCULAR ELECTRICAL STIMULATION/
31	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
32	NMES.ti,ab.
33	FES.ti,ab.
34	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.
35	exp ORTHOSIS/
36	splint$.ti,ab.
37	orthos?s.ti,ab.
38	orthotic?.ti,ab.
39	brace?.ti,ab.
40	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
41	"ACCEPTANCE AND COMMITMENT THERAPY"/

#	Searches
42	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
43	MINDFULNESS/
44	Mindfulness.ti,ab.
45	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
46	mentali?ation.ti,ab.
47	RELAXATION TRAINING/
48	BREATHING EXERCISE/
49	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.
50	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
51	COGNITIVE BEHAVIORAL THERAPY/
52	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
53	CBT.ti,ab.
54	VOCATIONAL REHABILITATION/
55	JOB ADAPTATION/
56	(exp EMPLOYMENT/ or WORKPLACE/) and (ADAPTATION/ or ACCLIMATIZATION/ or exp COPING BEHAVIOR/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF HELP DEVICE/ or ASSISTIVE TECHNOLOGY DEVICE/)
57	((vocation$ or work$ or job? or employment or employee? or profession? or occupation?) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
58	RETURN TO WORK/
59	WORK RESUMPTION/
60	(return$ adj3 work$).ti,ab.
61	VOCATIONAL GUIDANCE/
62	((vocation$ or work$ or job? or employment or employee? or profession? or occupation? or career?) adj5 (guid$ or counsel$)).ti,ab.
63	exp MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
64	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
65	or/27-64
66	26 and 65
67	limit 66 to english language
68	limit 67 to yr="1995 -Current"
69	letter.pt. or LETTER/
70	note.pt.
71	editorial.pt.
72	CASE REPORT/ or CASE STUDY/
73	(letter or comment*).ti.
74	or/69-73
75	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
76	74 not 75
77	ANIMAL/ not HUMAN/
78	NONHUMAN/
79	exp ANIMAL EXPERIMENT/
80	exp EXPERIMENTAL ANIMAL/
81	ANIMAL MODEL/
82	exp RODENT/
83	(rat or rats or mouse or mice).ti.
84	or/76-83
85	68 not 84
86	17 and 85

Database: Cochrane Central Register of Controlled Trials

#	Searches
#1	[mh ^"ECONOMICS"]
#2	[mh ^"VALUE OF LIFE"]
#3	[mh "COSTS AND COST ANALYSIS"]
#4	[mh "ECONOMICS, HOSPITAL"]
#5	[mh "ECONOMICS, MEDICAL"]
#6	[mh "RESOURCE ALLOCATION"]
#7	[mh ^"ECONOMICS, NURSING"]
#8	[mh ^"ECONOMICS, PHARMACEUTICAL"]
#9	[mh "FEES AND CHARGES"]
#10	[mh "BUDGETS"]
#11	budget*:ti,ab
#12	cost*:ti,ab
#13	(economic* or pharmaco?economic*):ti,ab
#14	(price* or pricing*):ti,ab
#15	(financ* or fee or fees or expenditure* or saving*):ti,ab
#16	(value near/2 (money or monetary)):ti,ab
#17	resourc* allocat*:ti,ab

#	Searches
#18	(fund or funds or funding* or funded):ti,ab
#19	(ration or rations or rationing* or rationed) .ti,ab.
#20	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19
#21	[mh ^"PERIPHERAL NERVE INJURIES"]
#22	[mh "CRANIAL NERVE INJURIES"]
#23	[mh "PERIPHERAL NERVOUS SYSTEM"/IN]
#24	[mh "COMPLEX REGIONAL PAIN SYNDROMES"]
#25	[mh "NERVE COMPRESSION SYNDROMES"]
#26	#24 or #25
#27	(injur* or damag* or lesion* or trauma*):ti,ab
#28	#26 and #27
#29	(nerve* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#30	("nervous tissue*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#31	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) near/3 plexus near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#32	("complex regional* pain syndrome*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#33	(causalgia near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#34	("reflex sympathetic dystroph*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#35	(("carpal tunnel" or "piriformis muscle*" or "tarsal tunnel" or "thoracic outlet" or "cervical rib*" or "cubital tunnel") near/3 syndrome* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#36	#21 or #22 or #23 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35
#37	[mh ^"ELECTRIC STIMULATION THERAPY"]
#38	(electr* near/5 (nerve* or neuro* or muscl* or function*) near/5 stimulat*):ti,ab
#39	NMES:ti,ab
#40	FES:ti,ab
#41	((desensiti* or "de-sensiti*" or hyposensiti* or "hypo-sensiti*" or hypersensiti* or "hyper-sensiti*") near/5 (therap* or program* or train* or technique* or strateg* or condition* or progress* or massag* or textur* or velvet or velcro or cloth* or moleskin* or "mole skin*" or towel* or touch* or immersi*)):ti,ab
#42	[mh ^SPLINTS]
#43	[mh ^"ORTHOTIC DEVICES"]
#44	splint*:ti,ab
#45	orthosis:ti,ab
#46	orthoses:ti,ab
#47	orthotic*:ti,ab
#48	brace*:ti,ab
#49	(Compassion* near/3 mind* near/3 (therap* or train*)):ti,ab
#50	[mh ^"ACCEPTANCE AND COMMITMENT THERAPY"]
#51	(Accept* near/3 commit* near/3 (therap* or train*)):ti,ab
#52	[mh ^MINDFULNESS]
#53	Mindfulness:ti,ab
#54	(Visualization near/3 (therap* or train*)):ti,ab
#55	(Visualisation near/3 (therap* or train*)):ti,ab
#56	mentalization:ti,ab
#57	mentalisation:ti,ab
#58	[mh ^"RELAXATION THERAPY"]
#59	[mh ^"BREATHING EXERCISES"]
#60	((Relax* or progressive* or breath*) near/3 (therap* or train* or exercis*)):ti,ab
#61	(Mirror* near/3 (therap* or train* or feedback)):ti,ab
#62	[mh ^"COGNITIVE THERAPY"]
#63	(Cognit* near/3 behav* near/3 (therap* or train*)):ti,ab
#64	CBT:ti,ab
#65	[mh ^"REHABILITATION, VOCATIONAL"]
#66	[mh ^EMPLOYMENT]
#67	[mh ^"EMPLOYMENT, SUPPORTED"]
#68	[mh ^WORKPLACE]
#69	#66 or #67 or #68
#70	[mh ^"ADAPTATION, PHYSIOLOGICAL"]
#71	[mh ^ACCLIMATIZATION]
#72	[mh "ADAPTATION, PSYCHOLOGICAL"]
#73	[mh ^ERGONOMICS]
#74	[mh ^"EQUIPMENT DESIGN"]
#75	[mh ^"SELF-HELP DEVICES"]
#76	#70 or #71 or #72 or #73 or #74 or #75
#77	#69 and #76
#78	((vocation* or work* or job* or employment or employee* or profession* or occupation*) near/5 (rehab* or support* or adjust* or adapt* or chang* or reintegrat* or "re-integrat*" or facilitat* or intervention* or equipment or ergonomic* or "assist* tech*")):ti,ab
#79	[mh ^"RETURN TO WORK"]
#80	(return* near/3 work*):ti,ab

#	Searches
#81	[mh ^"VOCATIONAL GUIDANCE"]
#82	((vocation* or work* or job* or employment or employee* or profession* or occupation* or career*) near/5 (guid* or counsel*)):ti,ab
#83	[mh ^"MOTOR CORTEX"]
#84	(remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*):ti,ab
#85	#83 and #84
#86	((sens* or somato* or motor*) near/5 cort* near/5 (remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*)):ti,ab
#87	#37 or #38 or #39 or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #63 or #64 or #65 or #77 or #78 or #79 or #80 or #81 or #82 or #85 or #86
#88	#36 and #87 with Publication Year from 1995 to 2019, in Trials
#89	#20 and #88

Literature search strategies for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Note the searches for this review question were re-run on 12/11/2020 but with a randomized controlled trial search filter added. This was in order to capture any high level evidence published since the original search was run on 25/02/2019.

Review question search strategies

Databases: Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

Date of last search: 25/02/2019

#	Searches
1	ADOLESCENT/ or MINORS/
2	(adolescen$ or teen$ or youth$ or young or juvenile? or minors or highschool$).ti,ab,jw,nw.
3	exp CHILD/
4	(child$ or schoolchild$ or "school age" or "school aged" or preschool$ or toddler$ or kid? or kindergar$ or boy? or girl?).ti,ab,jw,nw.
5	exp INFANT/
6	(infan$ or neonat$ or newborn$ or baby or babies).ti,ab,jw,nw.
7	exp PEDIATRICS/ or exp PUBERTY/
8	(p?ediatric$ or pubert$ or prepubert$ or pubescen$ or prepubescen$).ti,ab,jw,nw.
9	or/1-8
10	PERIPHERAL NERVE INJURIES/
11	exp CRANIAL NERVE INJURIES/
12	exp PERIPHERAL NERVOUS SYSTEM/in [Injuries]
13	exp COMPLEX REGIONAL PAIN SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
14	exp NERVE COMPRESSION SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
15	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
16	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
17	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
18	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
19	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
20	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
21	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
22	or/10-21
23	ELECTRIC STIMULATION THERAPY/
24	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
25	NMES.ti,ab.
26	FES.ti,ab.
27	MUSCLE STRETCHING EXERCISES/
28	proprioceptive neuromuscular facilitation.ti,ab.
29	PNF.ti,ab.
30	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.

#	Searches
31	SPLINTS/
32	exp ORTHOTIC DEVICES/
33	splint$.ti,ab.
34	orthos?s.ti,ab.
35	orthotic?.ti,ab.
36	brace?.ti,ab.
37	MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
38	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
39	FAMILY THERAPY/
40	(famil$ adj3 therap$).ti,ab.
41	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
42	"ACCEPTANCE AND COMMITMENT THERAPY"/
43	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
44	MINDFULNESS/
45	Mindfulness.ti,ab.
46	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
47	mentali?ation.ti,ab.
48	RELAXATION THERAPY/
49	BREATHING EXERCISES/
50	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.
51	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
52	COGNITIVE THERAPY/
53	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
54	CBT.ti,ab.
55	(EDUCATION/ or SCHOOLS/) and (ADAPTATION, PHYSIOLOGICAL/ or ACCLIMATIZATION/ or exp ADAPTATION, PSYCHOLOGICAL/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF-HELP DEVICES/)
56	((education$ or school$) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
57	(return$ adj3 (education$ or school$)).ti,ab.
58	HYDROTHERAPY/
59	hydrotherap$.ti,ab.
60	PLAY THERAPY/
61	(play$ adj3 therap$).ti,ab.
62	theraband?.ti,ab.
63	or/23-62
64	22 and 63
65	limit 64 to english language
66	limit 65 to yr="1995 -Current"
67	LETTER/
68	EDITORIAL/
69	NEWS/
70	exp HISTORICAL ARTICLE/
71	ANECDOTES AS TOPIC/
72	COMMENT/
73	CASE REPORT/
74	(letter or comment*).ti.
75	or/67-74
76	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
77	75 not 76
78	ANIMALS/ not HUMANS/
79	exp ANIMALS, LABORATORY/
80	exp ANIMAL EXPERIMENTATION/
81	exp MODELS, ANIMAL/
82	exp RODENTIA/
83	(rat or rats or mouse or mice).ti.
84	or/77-83
85	66 not 84
86	9 and 85

Databases: Embase; and Embase Classic

Date of last search 25/02/2019

#	Searches
1	exp ADOLESCENT/
2	(adolescen$ or teen$ or youth$ or young or juvenile? or minors or highschool$).ti,ab,jx.
3	exp CHILD/
4	(child$ or schoolchild$ or "school age" or "school aged" or preschool$ or toddler$ or kid? or kindergar$ or boy? or girl?).ti,ab,jx.

#	Searches
5	exp INFANT/
6	(infan$ or neonat$ or newborn$ or baby or babies).ti,ab,jx.
7	exp PEDIATRICS/ or exp PUBERTY/
8	(p?ediatric$ or pubert$ or prepubert$ or pubescen$ or prepubescen$).ti,ab,jx,ec.
9	or/1-8
10	exp NERVE INJURY/
11	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
12	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
13	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
14	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
15	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
16	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
17	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
18	or/10-17
19	ELECTROTHERAPY/
20	*NERVE STIMULATION/
21	FUNCTIONAL ELECTRICAL STIMULATION/
22	NEUROMUSCULAR ELECTRICAL STIMULATION/
23	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
24	NMES.ti,ab.
25	FES.ti,ab.
26	STRETCHING EXERCISE/
27	proprioceptive neuromuscular facilitation.ti,ab.
28	PNF.ti,ab.
29	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.
30	exp ORTHOSIS/
31	splint$.ti,ab.
32	orthos?s.ti,ab.
33	orthotic?.ti,ab.
34	brace?.ti,ab.
35	exp MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
36	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
37	FAMILY THERAPY/
38	(famil$ adj3 therap$).ti,ab.
39	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
40	"ACCEPTANCE AND COMMITMENT THERAPY"/
41	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
42	MINDFULNESS/
43	Mindfulness.ti,ab.
44	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
45	mentali?ation.ti,ab.
46	RELAXATION TRAINING/
47	BREATHING EXERCISE/
48	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.
49	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
50	COGNITIVE BEHAVIORAL THERAPY/
51	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
52	CBT.ti,ab.
53	(EDUCATION/ or SCHOOL/ or COLLEGE/ or COMMUNITY COLLEGE/ or HIGH SCHOOL/ or KINDERGARTEN/ or MIDDLE SCHOOL/ or NURSERY SCHOOL/ or PRIMARY SCHOOL/) and (ADAPTATION/ or ACCLIMATIZATION/ or exp COPING BEHAVIOR/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF HELP DEVICE/ or ASSISTIVE TECHNOLOGY DEVICE/)
54	((education$ or school$) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
55	(return$ adj3 (education$ or school$)).ti,ab.
56	HYDROTHERAPY/
57	hydrotherap$.ti,ab.
58	PLAY THERAPY/
59	(play$ adj3 therap$).ti,ab.
60	theraband?.ti,ab.
61	or/19-60
62	18 and 61
63	limit 62 to english language
64	limit 63 to yr="1995 -Current"
65	letter.pt. or LETTER/

#	Searches
66	note.pt.
67	editorial.pt.
68	CASE REPORT/ or CASE STUDY/
69	(letter or comment*).ti.
70	or/65-69
71	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
72	70 not 71
73	ANIMAL/ not HUMAN/
74	NONHUMAN/
75	exp ANIMAL EXPERIMENT/
76	exp EXPERIMENTAL ANIMAL/
77	ANIMAL MODEL/
78	exp RODENT/
79	(rat or rats or mouse or mice).ti.
80	or/72-79
81	64 not 80
82	9 and 81

Databases: Cochrane Central Register of Controlled Trials; and Cochrane Database of Systematic Reviews

Date of last search:25/02/2019

#	Searches
#1	[mh ^"ADOLESCENT"]
#2	[mh ^"MINORS"]
#3	(adolescen* or teen* or youth* or young or juvenile* or minors or highschool*):ti,ab
#4	[mh "CHILD"]
#5	(child* or schoolchild* or "school age" or "school aged" or preschool* or toddler* or kid* or kindergar* or boy* or girl*):ti,ab
#6	[mh "INFANT"]
#7	(infan* or neonat* or newborn* or baby or babies):ti,ab
#8	[mh "PEDIATRICS"]
#9	[mh "PUBERTY"]
#10	(pediatric* or paediatric* or prepubert* or pubescen* or prepubescen*):ti,ab
#11	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10
#12	[mh ^"PERIPHERAL NERVE INJURIES"]
#13	[mh "CRANIAL NERVE INJURIES"]
#14	[mh "PERIPHERAL NERVOUS SYSTEM"/IN]
#15	[mh "COMPLEX REGIONAL PAIN SYNDROMES"]
#16	[mh "NERVE COMPRESSION SYNDROMES"]
#17	#15 or #16
#18	(injur* or damag* or lesion* or trauma*):ti,ab
#19	#17 and #18
#20	(nerve* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#21	("nervous tissue*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#22	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) near/3 plexus near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#23	("complex regional* pain syndrome*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#24	(causalgia near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#25	("reflex sympathetic dystroph*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#26	(("carpal tunnel" or "piriformis muscle*" or "tarsal tunnel" or "thoracic outlet" or "cervical rib*" or "cubital tunnel") near/3 syndrome* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#27	#12 or #13 or #14 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26
#28	[mh ^"ELECTRIC STIMULATION THERAPY"]
#29	(electr* near/5 (nerve* or neuro* or muscl* or function*) near/5 stimulat*):ti,ab
#30	NMES:ti,ab
#31	FES:ti,ab
#32	[mh ^"MUSCLE STRETCHING EXERCISES"]
#33	"proprioceptive neuromuscular facilitation":ti,ab
#34	PNF:ti,ab
#35	((desensiti* or "de-sensiti*" or hyposensiti* or "hypo-sensiti*" or hypersensiti* or "hyper-sensiti*") near/5 (therap* or program* or train* or technique* or strateg* or condition* or progress* or massag* or textur* or velvet or velcro or cloth* or moleskin* or "mole skin*" or towel* or touch* or immersi*)):ti,ab
#36	[mh ^SPLINTS]
#37	[mh ^"ORTHOTIC DEVICES"]
#38	splint*:ti,ab
#39	orthosis:ti,ab
#40	orthoses:ti,ab

#	Searches
#41	orthotic*:ti,ab
#42	brace*:ti,ab
#43	[mh ^"MOTOR CORTEX"]
#44	(remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*):ti,ab
#45	#43 and #44
#46	((sens* or somato* or motor*) near/5 cort* near/5 (remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*)):ti,ab
#47	[mh ^"FAMILY THERAPY"]
#48	(famil* near/3 therap*):ti,ab
#49	(Compassion* near/3 mind* near/3 (therap* or train*)):ti,ab
#50	[mh ^"ACCEPTANCE AND COMMITMENT THERAPY"]
#51	(Accept* near/3 commit* near/3 (therap* or train*)):ti,ab
#52	[mh ^MINDFULNESS]
#53	Mindfulness:ti,ab
#54	(Visualization near/3 (therap* or train*)):ti,ab
#55	(Visualisation near/3 (therap* or train*)):ti,ab
#56	mentalization:ti,ab
#57	mentalisation:ti,ab
#58	[mh ^"RELAXATION THERAPY"]
#59	[mh ^"BREATHING EXERCISES"]
#60	((Relax* or progressive* or breath*) near/3 (therap* or train* or exercis*)):ti,ab
#61	(Mirror* near/3 (therap* or train* or feedback)):ti,ab
#62	[mh ^"COGNITIVE THERAPY"]
#63	(Cognit* near/3 behav* near/3 (therap* or train*)):ti,ab
#64	CBT:ti,ab
#65	[mh ^"EDUCATION"]
#66	[mh ^"SCHOOLS"]
#67	#65 or #66
#68	[mh ^"ADAPTATION, PHYSIOLOGICAL"]
#69	[mh ^ACCLIMATIZATION]
#70	[mh "ADAPTATION, PSYCHOLOGICAL"]
#71	[mh ^ERGONOMICS]
#72	[mh ^"EQUIPMENT DESIGN"]
#73	[mh ^"SELF-HELP DEVICES"]
#74	#68 or #69 or #70 or #71 or #72 or #73
#75	#67 and #74
#76	((education* or school*) near/5 (rehab* or support* or adjust* or adapt* or chang* or reintegrat* or re-integrat* or facilitat* or intervention* or equipment or ergonomic* or "assist* tech*")):ti,ab
#77	(return* near/3 (education* or school*)):ti,ab
#78	[mh ^"HYDROTHERAPY"]
#79	hydrotherap*:ti,ab
#80	[mh ^"PLAY THERAPY"]
#81	(play* near/3 therap*):ti,ab
#82	theraband*:ti,ab
#83	#28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #63 or #64 or #75 or #76 or #77 or #78 or #79 or #80 or #81 or #82
#84	#27 and #83
#85	#11 and #84
#86	#11 and #84 with Cochrane Library publication date Between Jan 1995 and Feb 2019, in Cochrane Reviews, Cochrane Protocols
#87	#11 and #84 with Publication Year from 1995 to 2019, in Trials

Health economics search strategies

Databases: Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

Date of last search: 25/02/2019

#	Searches
1	ECONOMICS/
2	VALUE OF LIFE/
3	exp "COSTS AND COST ANALYSIS"/
4	exp ECONOMICS, HOSPITAL/
5	exp ECONOMICS, MEDICAL/
6	exp RESOURCE ALLOCATION/
7	ECONOMICS, NURSING/

#	Searches
8	ECONOMICS, PHARMACEUTICAL/
9	exp "FEES AND CHARGES"/
10	exp BUDGETS/
11	budget*.ti,ab.
12	cost*.ti,ab.
13	(economic* or pharmaco?economic*).ti,ab.
14	(price* or pricing*).ti,ab.
15	(financ* or fee or fees or expenditure* or saving*).ti,ab.
16	(value adj2 (money or monetary)).ti,ab.
17	resourc* allocat*.ti,ab.
18	(fund or funds or funding* or funded).ti,ab.
19	(ration or rations or rationing* or rationed).ti,ab.
20	ec.fs.
21	or/1-20
22	ADOLESCENT/ or MINORS/
23	(adolescen$ or teen$ or youth$ or young or juvenile? or minors or highschool$).ti,ab,jw,nw.
24	exp CHILD/
25	(child$ or schoolchild$ or "school age" or "school aged" or preschool$ or toddler$ or kid? or kindergar$ or boy? or girl?).ti,ab,jw,nw.
26	exp INFANT/
27	(infan$ or neonat$ or newborn$ or baby or babies).ti,ab,jw,nw.
28	exp PEDIATRICS/ or exp PUBERTY/
29	(p?ediatric$ or pubert$ or prepubert$ or pubescen$ or prepubescen$).ti,ab,jw,nw.
30	or/22-29
31	PERIPHERAL NERVE INJURIES/
32	exp CRANIAL NERVE INJURIES/
33	exp PERIPHERAL NERVOUS SYSTEM/in [Injuries]
34	exp COMPLEX REGIONAL PAIN SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
35	exp NERVE COMPRESSION SYNDROMES/ and (injur$ or damag$ or lesion? or trauma$).ti,ab.
36	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
37	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
38	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
39	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
40	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
41	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
42	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
43	or/31-42
44	ELECTRIC STIMULATION THERAPY/
45	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
46	NMES.ti,ab.
47	FES.ti,ab.
48	MUSCLE STRETCHING EXERCISES/
49	proprioceptive neuromuscular facilitation.ti,ab.
50	PNF.ti,ab.
51	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.
52	SPLINTS/
53	exp ORTHOTIC DEVICES/
54	splint$.ti,ab.
55	orthos?s.ti,ab.
56	orthotic?.ti,ab.
57	brace?.ti,ab.
58	MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
59	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
60	FAMILY THERAPY/
61	(famil$ adj3 therap$).ti,ab.
62	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
63	"ACCEPTANCE AND COMMITMENT THERAPY"/
64	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
65	MINDFULNESS/
66	Mindfulness.ti,ab.
67	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
68	mentali?ation.ti,ab.
69	RELAXATION THERAPY/
70	BREATHING EXERCISES/
71	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.

#	Searches
72	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
73	COGNITIVE THERAPY/
74	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
75	CBT.ti,ab.
76	(EDUCATION/ or SCHOOLS/) and (ADAPTATION, PHYSIOLOGICAL/ or ACCLIMATIZATION/ or exp ADAPTATION, PSYCHOLOGICAL/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF-HELP DEVICES/)
77	((education$ or school$) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
78	(return$ adj3 (education$ or school$)).ti,ab.
79	HYDROTHERAPY/
80	hydrotherap$.ti,ab.
81	PLAY THERAPY/
82	(play$ adj3 therap$).ti,ab.
83	theraband?.ti,ab.
84	or/44-83
85	43 and 84
86	limit 85 to english language
87	limit 86 to yr="1995 -Current"
88	LETTER/
89	EDITORIAL/
90	NEWS/
91	exp HISTORICAL ARTICLE/
92	ANECDOTES AS TOPIC/
93	COMMENT/
94	CASE REPORT/
95	(letter or comment*).ti.
96	or/88-95
97	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
98	96 not 97
99	ANIMALS/ not HUMANS/
100	exp ANIMALS, LABORATORY/
101	exp ANIMAL EXPERIMENTATION/
102	exp MODELS, ANIMAL/
103	exp RODENTIA/
104	(rat or rats or mouse or mice).ti.
105	or/98-104
106	87 not 105
107	30 and 106
108	21 and 107

Databases: Embase; and Embase Classic

Date of last search: 25/02/2019

#	Searches
1	HEALTH ECONOMICS/
2	exp ECONOMIC EVALUATION/
3	exp HEALTH CARE COST/
4	exp FEE/
5	BUDGET/
6	FUNDING/
7	RESOURCE ALLOCATION/
8	budget*.ti,ab.
9	cost*.ti,ab.
10	(economic* or pharmaco?economic*).ti,ab.
11	(price* or pricing*).ti,ab.
12	(financ* or fee or fees or expenditure* or saving*).ti,ab.
13	(value adj2 (money or monetary)).ti,ab.
14	resourc* allocat*.ti,ab.
15	(fund or funds or funding* or funded).ti,ab.
16	(ration or rations or rationing* or rationed).ti,ab.
17	or/1-16
18	exp ADOLESCENT/
19	(adolescen$ or teen$ or youth$ or young or juvenile? or minors or highschool$).ti,ab,jx.
20	exp CHILD/
21	(child$ or schoolchild$ or "school age" or "school aged" or preschool$ or toddler$ or kid? or kindergar$ or boy? or girl?).ti,ab,jx.
22	exp INFANT/
23	(infan$ or neonat$ or newborn$ or baby or babies).ti,ab,jx.
24	exp PEDIATRICS/ or exp PUBERTY/

#	Searches
25	(p?ediatric$ or pubert$ or prepubert$ or pubescen$ or prepubescen$).ti,ab,jx,ec.
26	or/18-25
27	exp NERVE INJURY/
28	(nerve? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
29	(nervous tissue? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
30	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) adj3 plexus adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
31	(complex regional$ pain syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
32	(causalgia adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
33	(reflex sympathetic dystroph$ adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
34	((carpal tunnel or piriformis muscle? or tarsal tunnel or thoracic outlet or cervical rib? or cubital tunnel) adj3 syndrome? adj5 (injur$ or damag$ or lesion? or trauma$)).ti,ab.
35	or/27-34
36	ELECTROTHERAPY/
37	*NERVE STIMULATION/
38	FUNCTIONAL ELECTRICAL STIMULATION/
39	NEUROMUSCULAR ELECTRICAL STIMULATION/
40	(electr$ adj5 (nerve? or neuro$ or muscl$ or function$) adj5 stimulat$).ti,ab.
41	NMES.ti,ab.
42	FES.ti,ab.
43	STRETCHING EXERCISE/
44	proprioceptive neuromuscular facilitation.ti,ab.
45	PNF.ti,ab.
46	((desensiti$ or de-sensiti$ or hyposensiti$ or hypo-sensiti$ or hypersensiti$ or hyper-sensiti$) adj5 (therap$ or program$ or train$ or technique$ or strateg$ or condition$ or progress$ or massag$ or textur$ or velvet or velcro or cloth$ or moleskin? or mole skin? or towel$ or touch$ or immersi$)).ti,ab.
47	exp ORTHOSIS/
48	splint$.ti,ab.
49	orthos?s.ti,ab.
50	orthotic?.ti,ab.
51	brace?.ti,ab.
52	exp MOTOR CORTEX/ and (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$).ti,ab.
53	((sens$ or somato$ or motor$) adj5 cort$ adj5 (remap$ or re-map$ or map$ or reorgani$ or re-organi$ or organi$)).ti,ab.
54	FAMILY THERAPY/
55	(famil$ adj3 therap$).ti,ab.
56	(Compassion$ adj3 mind$ adj3 (therap$ or train$)).ti,ab.
57	"ACCEPTANCE AND COMMITMENT THERAPY"/
58	(Accept$ adj3 commit$ adj3 (therap$ or train$)).ti,ab.
59	MINDFULNESS/
60	Mindfulness.ti,ab.
61	(Visuali?ation adj3 (therap$ or train$)).ti,ab.
62	mentali?ation.ti,ab.
63	RELAXATION TRAINING/
64	BREATHING EXERCISE/
65	((Relax$ or progressive$ or breath$) adj3 (therap$ or train$ or exercis$)).ti,ab.
66	(Mirror? adj3 (therap$ or train$ or feedback)).ti,ab.
67	COGNITIVE BEHAVIORAL THERAPY/
68	(Cognit$ adj3 behav$ adj3 (therap$ or train$)).ti,ab.
69	CBT.ti,ab.
70	(EDUCATION/ or SCHOOL/ or COLLEGE/ or COMMUNITY COLLEGE/ or HIGH SCHOOL/ or KINDERGARTEN/ or MIDDLE SCHOOL/ or NURSERY SCHOOL/ or PRIMARY SCHOOL/) and (ADAPTATION/ or ACCLIMATIZATION/ or exp COPING BEHAVIOR/ or ERGONOMICS/ or EQUIPMENT DESIGN/ or SELF HELP DEVICE/ or ASSISTIVE TECHNOLOGY DEVICE/)
71	((education$ or school$) adj5 (rehab$ or support$ or adjust$ or adapt$ or chang$ or reintegrat$ or re-integrat$ or facilitat$ or intervention? or equipment or ergonomic$ or assist$ tech$)).ti,ab.
72	(return$ adj3 (education$ or school$)).ti,ab.
73	HYDROTHERAPY/
74	hydrotherap$.ti,ab.
75	PLAY THERAPY/
76	(play$ adj3 therap$).ti,ab.
77	theraband?.ti,ab.
78	or/36-77
79	35 and 78
80	limit 79 to english language
81	limit 80 to yr="1995 -Current"
82	letter.pt. or LETTER/
83	note.pt.
84	editorial.pt.
85	CASE REPORT/ or CASE STUDY/

#	Searches
86	(letter or comment*).ti.
87	or/82-86
88	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
89	87 not 88
90	ANIMAL/ not HUMAN/
91	NONHUMAN/
92	exp ANIMAL EXPERIMENT/
93	exp EXPERIMENTAL ANIMAL/
94	ANIMAL MODEL/
95	exp RODENT/
96	(rat or rats or mouse or mice).ti.
97	or/89-96
98	81 not 97
99	26 and 98
100	17 and 99

Database: Cochrane Central Register of Controlled Trials

Date of last search: 25/02/2019

#	Searches
#1	[mh ^"ECONOMICS"]
#2	[mh "VALUE OF LIFE"]
#3	[mh "COSTS AND COST ANALYSIS"]
#4	[mh "ECONOMICS, HOSPITAL"]
#5	[mh "ECONOMICS, MEDICAL"]
#6	[mh "RESOURCE ALLOCATION"]
#7	[mh ^"ECONOMICS, NURSING"]
#8	[mh "ECONOMICS, PHARMACEUTICAL"]
#9	[mh "FEES AND CHARGES"]
#10	[mh "BUDGETS"]
#11	budget*:ti,ab
#12	cost*:ti,ab
#13	(economic* or pharmaco?economic*):ti,ab
#14	(price* or pricing*):ti,ab
#15	(financ* or fee or fees or expenditure* or saving*):ti,ab
#16	(value near/2 (money or monetary)):ti,ab
#17	resourc* allocat*:ti,ab
#18	(fund or funds or funding* or funded):ti,ab
#19	(ration or rations or rationing* or rationed) .ti,ab.
#20	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19
#21	[mh ^"ADOLESCENT"]
#22	[mh ^"MINORS"]
#23	(adolescen* or teen* or youth* or young or juvenile* or minors or highschool*):ti,ab
#24	[mh "CHILD"]
#25	(child* or schoolchild* or "school age" or "school aged" or preschool* or toddler* or kid* or kindergar* or boy* or girl*):ti,ab
#26	[mh "INFANT"]
#27	(infan* or neonat* or newborn* or baby or babies):ti,ab
#28	[mh "PEDIATRICS"]
#29	[mh "PUBERTY"]
#30	(pediatric* or paediatric* or prepubert* or pubescen* or prepubescen*):ti,ab
#31	#21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30
#32	[mh ^"PERIPHERAL NERVE INJURIES"]
#33	[mh "CRANIAL NERVE INJURIES"]
#34	[mh "PERIPHERAL NERVOUS SYSTEM"/IN]
#35	[mh "COMPLEX REGIONAL PAIN SYNDROMES"]
#36	[mh "NERVE COMPRESSION SYNDROMES"]
#37	#35 or #36
#38	(injur* or damag* or lesion* or trauma*):ti,ab
#39	#37 and #38
#40	(nerve* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#41	("nervous tissue*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#42	((brachial or lumbosacral or lumba or sacral or cervical or coccygeal) near/3 plexus near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#43	("complex regional* pain syndrome*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#44	(causalgia near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#45	("reflex sympathetic dystroph*" near/5 (injur* or damag* or lesion* or trauma*)):ti,ab

#	Searches
#46	(("carpal tunnel" or "piriformis muscle*" or "tarsal tunnel" or "thoracic outlet" or "cervical rib*" or "cubital tunnel") near/3 syndrome* near/5 (injur* or damag* or lesion* or trauma*)):ti,ab
#47	#32 or #33 or #34 or #39 or #40 or #41 or #42 or #43 or #44 or #45 or #46
#48	[mh ^"ELECTRIC STIMULATION THERAPY"]
#49	(electr* near/5 (nerve* or neuro* or muscl* or function*) near/5 stimulat*):ti,ab
#50	NMES:ti,ab
#51	FES:ti,ab
#52	[mh ^"MUSCLE STRETCHING EXERCISES"]
#53	"proprioceptive neuromuscular facilitation":ti,ab
#54	PNF:ti,ab
#55	((desensiti* or "de-sensiti*" or hyposensiti* or "hypo-sensiti*" or hypersensiti* or "hyper-sensiti*") near/5 (therap* or program* or train* or technique* or strateg* or condition* or progress* or massag* or textur* or velvet or velcro or cloth* or moleskin* or "mole skin*" or towel* or touch* or immersi*)):ti,ab
#56	[mh ^SPLINTS]
#57	[mh ^"ORTHOTIC DEVICES"]
#58	splint*:ti,ab
#59	orthosis:ti,ab
#60	orthoses:ti,ab
#61	orthotic*:ti,ab
#62	brace*:ti,ab
#63	[mh ^"MOTOR CORTEX"]
#64	(remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*):ti,ab
#65	#63 and #64
#66	((sens* or somato* or motor*) near/5 cort* near/5 (remap* or "re-map*" or map* or reorgani* or "re-organi*" or organi*)):ti,ab
#67	[mh ^"FAMILY THERAPY"]
#68	(famil* near/3 therap*):ti,ab
#69	(Compassion* near/3 mind* near/3 (therap* or train*)):ti,ab
#70	[mh ^"ACCEPTANCE AND COMMITMENT THERAPY"]
#71	(Accept* near/3 commit* near/3 (therap* or train*)):ti,ab
#72	[mh ^MINDFULNESS]
#73	Mindfulness:ti,ab
#74	(Visualization near/3 (therap* or train*)):ti,ab
#75	(Visualisation near/3 (therap* or train*)):ti,ab
#76	mentalization:ti,ab
#77	mentalisation:ti,ab
#78	[mh ^"RELAXATION THERAPY"]
#79	[mh ^"BREATHING EXERCISES"]
#80	((Relax* or progressive* or breath*) near/3 (therap* or train* or exercis*)):ti,ab
#81	(Mirror* near/3 (therap* or train* or feedback)):ti,ab
#82	[mh ^"COGNITIVE THERAPY"]
#83	(Cognit* near/3 behav* near/3 (therap* or train*)):ti,ab
#84	CBT:ti,ab
#85	[mh ^"EDUCATION"]
#86	[mh ^"SCHOOLS"]
#87	#85 or #86
#88	[mh ^"ADAPTATION, PHYSIOLOGICAL"]
#89	[mh ^ACCLIMATIZATION]
#90	[mh "ADAPTATION, PSYCHOLOGICAL"]
#91	[mh ^ERGONOMICS]
#92	[mh ^"EQUIPMENT DESIGN"]
#93	[mh ^"SELF-HELP DEVICES"]
#94	#88 or #89 or #90 or #91 or #92 or #93
#95	#87 and #94
#96	((education* or school*) near/5 (rehab* or support* or adjust* or adapt* or chang* or reintegrat* or re-integrat* or facilitat* or intervention* or equipment or ergonomic* or "assist* tech*")):ti,ab
#97	(return* near/3 (education* or school*)):ti,ab
#98	[mh ^"HYDROTHERAPY"]
#99	hydrotherap*:ti,ab
#100	[mh ^"PLAY THERAPY"]
#101	(play* near/3 therap*):ti,ab
#102	theraband*:ti,ab
#103	#48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #65 or #66 or #67 or #68 or #69 or #70 or #71 or #72 or #73 or #74 or #75 or #76 or #77 or #78 or #79 or #80 or #81 or #82 or #83 or #84 or #95 or #96 or #97 or #98 or #99 or #100 or #101 or #102
#104	#47 and #103
#105	#31 and #104
#106	#31 and #104 with Publication Year from 1995 to 2019, in Trials
#107	#20 and #106

Appendix C – Clinical evidence study selection

Clinical study selection for:

C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

A combined update search was conducted for both review questions.

Figure 1: Study selection flow chart: Adults

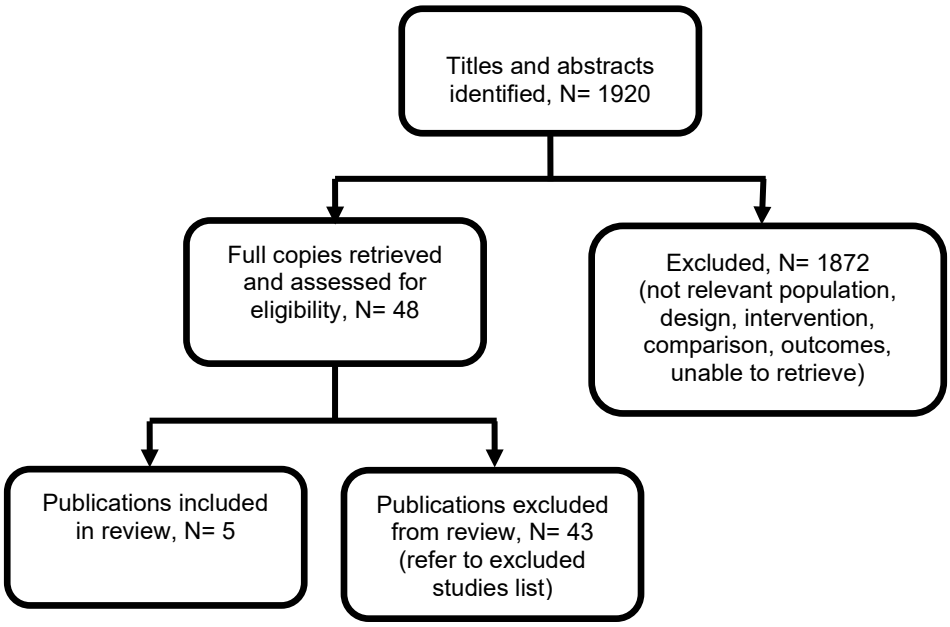
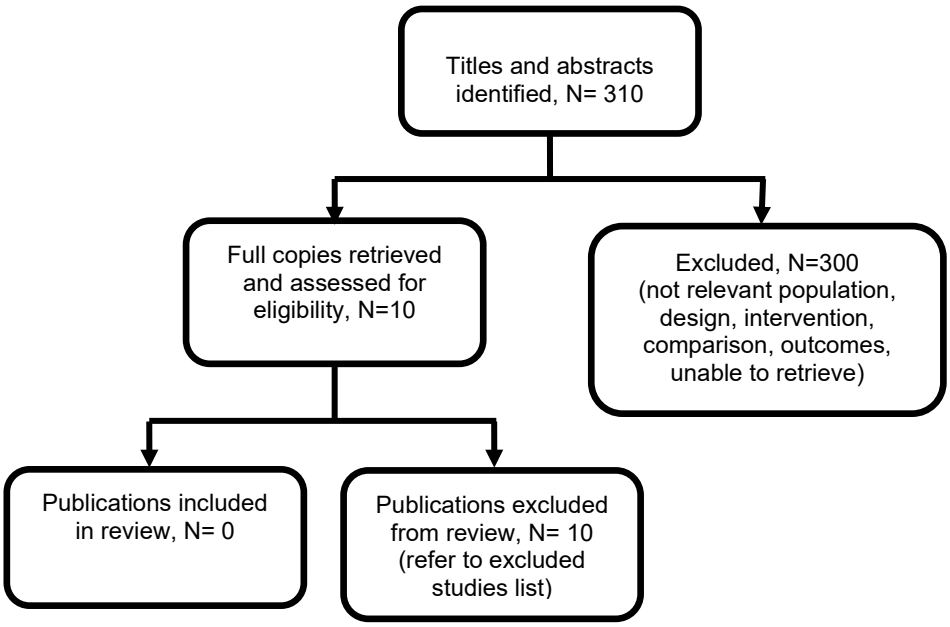


Figure 2: Study selection flow chart: Children and young people



Appendix D – Clinical evidence tables

Clinical evidence tables for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Table 6: Clinical evidence tables

Study details	Participants	Interventions	Outcomes and Results	Comments
Full citation Hsu HY, Chen PT, Kuan TS, Yang HC, Shieh SJ, Kuo LC. A Touch-Observation and Task-Based Mirror Therapy Protocol to Improve Sensorimotor Control and Functional Capability of Hands for Patients With Peripheral Nerve Injury, The American journal of occupational therapy : official publication of the American Occupational Therapy Association, 73, 7302205020p1-7302205020p10, 2019	**Sample size** N=12 (randomised) • Mirror therapy: 6 • Classical sensory re-education (CSR): 6 N=11 (analysed) • Mirror therapy: 6 • CSR: 5 **Characteristics** Age in years [Mean (SD)]: • Mirror therapy: 35.7 (9.3) • CSR: 39 (12.4) Gender (M/F): • Mirror therapy (n): 4/1; • CSR (n):4/1 Injured Nerve: • Mirror therapy (n): Median: 5; Ulnar: 1; • CSR (n): Median: 4; Ulnar: 1; Mechanism of injury:	**Interventions** • Touch-observation and task-based mirror therapy: 2 stage program “conducted before the hand reaches a pressure threshold of 4.31 on the SWM test” (p. 3): Stage 1 is initiated week 1 after nerve repair and consisted of 15 mins of touch-based mirror therapy 3 times a week. Stage 2 initiated after week 4 after nerve repair and consisted of 15 mins of task-based mirror therapy 3 times a week. Each 15-min session of mirror therapy was followed by 20 min of regular hand therapy (based on the protocol in the protective phase) and 20 min of	**Upper limb function** Perdue Pegboard test (measure used: unilateral pin insertion; mean (SD), higher is better): <u>Pre-treatment:</u> Mirror therapy: 5.6 (2.9) CSR: 7.2 (2.9) <u>Immediately after treatment:</u> Mirror therapy: 8.2 (3.7) CSR: 7.3 (2.9) <u>12 weeks after end of treatment:</u> Mirror therapy: 10.8 (4.4) CSR: 9.5 (2.3) Perdue Pegboard test (measure used: bilateral pin insertion; mean (SD), higher is better): <u>Pre-treatment:</u> Mirror therapy: 4.7 (1.5) CSR: 6.7 (2.5) <u>Immediately after treatment:</u> Mirror therapy: 7.7 (3.1) CSR: 7.3 (2.5) <u>12 weeks after end of treatment:</u> Mirror therapy: 10.8 (4.6) CSR: 9.2 (2.9)	**Limitations** **Quality assessment:** Risk of bias assessed using revised Cochrane risk of bias tool (RoB 2) **Domain 1: Risk of bias arising from the randomization process** 1.1 Was the allocation sequence random? NI – Study described as randomised, but not information about generation of randomisation sequence. 1.2 Was the allocation sequence concealed until participants were enrolled and

Study details	Participants	Interventions	Outcomes and Results	Comments
Ref Id 1129751 **Country/ies where the study was carried out** Taiwan **Study type** RCT **Aim of the study** "To investigate the effects of touch-observation and task-based mirror therapy on the sensorimotor outcomes of patients with nerve repair." (p. 1) **Study dates** 2014-2015 **Source of funding** "This work was financially supported by the Medical Device Innovation Center, National Cheng Kung University, from the Featured	• Mirror therapy (n): Guillotine: 2; crush: 3; avulsion: 1 • CSR (n): Guillotine: 1; crush: 4; avulsion: 0 Time from injury to recruitment in weeks [Mean (SD)]: • Mirror therapy: 8.2 (4.8) • CSR: 8 (5.1) **Inclusion criteria** "patients with nerve repair who experienced one of the following five injuries: (1) median or ulnar nerve injury, (2) a combination of nerve and tendon or vascular injury, (3) injury sites between the level of midpalm and elbow, (4) Class 3 injury type (neurotmesis type) under Seddon's (1942) classification, and (5) lacking or impaired sensation of the hand." (p. 2) **Exclusion criteria** Patients with "deficits in cognition or language	physiotherapy, for 12 weeks. "After the affected hand regains protective sensation (reaching a pressure threshold of 4.31 on the SWM test), the experimental program is replaced with a discriminative sensory reeducation program, with the training involving texture recognition, geometric discrimination, and object manipulation." (p. 3). • Classical sensory re-education (CSR): Before the return of protective sensation, each treatment session consisted of classical sensory re-education 15 min (including protective sensory re-education, exercise for re-educating the perception of constant pressure or moving touch across a specific area, and exercise for reeducating precision pinch force control) + 20 min regular hand therapy + 20 min	Perdue Pegboard test (measure used: assembly; mean (SD), higher is better): <u>Pre-treatment:</u> Mirror therapy: 14.3 (9.2) CSR: 21.3 (7.2) <u>Immediately after treatment:</u> Mirror therapy: 21.4 (10.7) CSR: 20.7 (6.8) <u>12 weeks after end of treatment:</u> Mirror therapy: 25.5 (11.1) CSR: 23.1 (7.6) Minnesota Manual Dexterity test (measure used: placing; mean seconds (SD), lower is better): <u>Pre-treatment:</u> Mirror therapy: 157.2 (47.1) CSR: 163.3 (53.7) <u>Immediately after treatment:</u> Mirror therapy: 128.7 (16.3) CSR: 139.2 (42.8) <u>12 weeks after end of treatment:</u> Mirror therapy: 110.7 (15.5) CSR: 133.2 (36.7) Minnesota Manual Dexterity test (measure used: turning; mean seconds (SD), lower is better): <u>Pre-treatment:</u> Mirror therapy: 130.7 (36.1) CSR: 113 (37) <u>Immediately after treatment:</u> Mirror therapy: 116.2 (24.8) CSR: 106 (42.2) <u>12 weeks after end of treatment:</u> Mirror therapy: 97.2 (14.6) CSR: 101.5 (38.3)	assigned to interventions? Y – Sealed opaque envelopes 1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? <u>PN</u> Risk-of-bias judgement: Some concerns **Domain 2: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)** 2.1. Were participants aware of their assigned intervention during the trial? <u>PY</u> 2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial? <u>Y</u>

Study details	Participants	Interventions	Outcomes and Results	Comments
Areas Research Center Program within the framework of the Higher Education Sprout Project by the Ministry of Education in Taiwan. This work was also supported by Ministry of Science and Technology Grant 103-2314-B-384-005." (p. 10)	comprehension and severe limitations in the range of motion of the upper limbs." (p. 2)	physiotherapy. Patients received 3 sessions a week for 12 weeks. As per the mirror therapy, once protective sensation returned, the discriminative sensory re-education program was begun. • All participants received scar management, stretching blocking exercise, and muscle strengthening protocols as home programs. "visually guided object-manipulation tasks were carried out as a home-based sensorimotor re-education (p. 3).	*The study authors report that the differences between pre-treatment and after treatment or between pre-treatment and 12 weeks after treatment end are different between the groups. However, these differences appear to be due to baseline/pre-treatment differences between the groups, rather than differences pertaining to the treatments per se. We have therefore only analysed the data from end of treatment and 12 weeks after end of treatment.*	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? NI 2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups? NA 2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome? NA 2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? PY 2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they

Study details	Participants	Interventions	Outcomes and Results	Comments
				were randomized? NA Risk-of-bias judgement: Some concerns **Domain 3: Missing outcome data** 3.1 Were data for this outcome available for all, or nearly all, participants randomized? PY – data available for 11/12. 3.2 If N/PN/NI to 3.1: Is there evidence that the result was not biased by missing outcome data? NI (although data only missing for 1 participants, that is still a substantial proportion given the low total N) 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? NI 3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the

Study details	Participants	Interventions	Outcomes and Results	Comments
				outcome depended on its true value? NI Risk-of-bias judgement: Some concerns **Domain 4: Risk of bias in measurement of the outcome** 4.1 Was the method of measuring the outcome inappropriate? N 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? N 4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants? N 4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of

Study details	Participants	Interventions	Outcomes and Results	Comments
				intervention received? NA 4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? NA Risk-of-bias judgement: Low risk **Domain 5: Risk of bias in selection of the reported result** 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? NI Is the numerical result being assessed likely to have been selected, on the basis of the results, from...

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td></td><td>5.2. ... multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain? NI
5.3 ... multiple analyses of the data? NI
Risk-of-bias judgement Some concerns
<u>Overall risk of bias</u>
Risk-of-bias judgement: High risk

Other information: None</td></tr>
<tr><td>Full citation
Paula, Mayara H., Barbosa, Rafael I., Marcolino, Alexandre M., Elui, Valeria M. C., Rosen, Birgitta, Fonseca, Marisa C. R., Early sensory re-education of the hand after peripheral nerve repair based on</td><td>Sample size
N=32 (randomised)
• Intervention: 16
• control: 16
N=20 (analysed)
• Intervention: 9
• control: 11
Characteristics
Age in years [Mean (SD)]:
• Intervention=24.3 (4.8)
• Control= 29.6 (12.2)</td><td>Interventions
• "Mirror therapy group: early sensory re-education program" (initiated in the 1st postoperative week). A mirror was placed in front of the patient on a table so that the reflected image of the healthy hand looked as if it were the injured hand. Tactile stimuli</td><td>Results
<table>
<tr><td colspan="7">at 3 months after nerve repair/surgery</td></tr>
<tr><td rowspan="2">OUTCOME MEASURE</td><td colspan="3">INTERVENTION</td><td colspan="3">Control</td></tr>
<tr><td>MEAN</td><td>SD</td><td>N</td><td>Mean</td><td>SD</td><td>N</td></tr>
<tr><td colspan="7">Critical (None)</td></tr>
<tr><td colspan="7">Important</td></tr>
<tr><td>Changes in mobility: Rosen score</td><td>1.68</td><td>0.50</td><td>11</td><td>1.65</td><td>0.52</td><td>9</td></tr>
<tr><td>Upper limb function: DASH questionnaire</td><td>24.25</td><td>19.38</td><td>11</td><td>38.62</td><td>27.66</td><td>9</td></tr>
<tr><td colspan="7">at 6 months after nerve repair/surgery</td></tr>
<tr><td></td><td colspan="3">INTERVENTION</td><td colspan="3">Control</td></tr>
</table></td><td>Limitations
Quality assessment: Risk of bias assessed using revised Cochrane risk of bias tool (RoB 2)
• Domain 1: Risk of bias arising from the randomization process</td></tr>
</table>

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr>
<td>mirror therapy: a randomized controlled trial, Brazilian journal of physical therapy, 20, 58-65, 2016

Ref Id
948706

Country/ies where the study was carried out
Brazil

Study type
RCT

Aim of the study
This RCT was aimed to compare the effectiveness of two interventions, an early re-education program using mirror therapy compared to a late classic sensory program, for hand nerve repair after injury

Study dates
• Publication date: 2016</td>
<td>Gender (M/F):
• Intervention (n): 5/4;
• Control (n): 9/3
Injured Nerve:
• Intervention (n) - Median: 5; Ulnar: 3; Combined: 2; Other: 0
• Control (n)- Median: 3; Ulnar: 5; Combined: 2; Other: 0
Mechanism of injury:
• Intervention (n) - Glass 8; Saw/knife: 0; Traffic accident 1; Other: 0
• Control (n)- Glass 9; Saw/knife: 2; Traffic accident 0; Other: 0

Inclusion criteria
Participants had to be: 1) at least 18 years old; 2) submitted to primary repair of the median or ulnar nerves with or without flexor tendon repair and 3) were referred to the study through the Hand Surgery Service of a university hospital

Exclusion criteria
Presence of associated fracture or other chronic</td>
<td>with several textures and shapes, manipulation of small objects, and active motion on the uninjured hand was performed for 30 minutes a day, 3 times a week, to give the brain the visual illusion of the injured hand. After the cast removal, the procedure was performed bilaterally. Standard mirror training was performed at home every single day, 30 minutes a day.
• "Classic sensory re-education group": sensory re-education was initiated only 3 months after nerve repair to the injured hand when protective sensation returned according to the Semmes Weinstein monofilament test and up to 5 months after surgery. This was performed in the same manner by tactile stimuli with several textures and shapes in a progressive and</td>
<td>
<table>
<tr><th>OUTCOME MEASURE</th><th>MEAN</th><th>SD</th><th>N</th><th>Mean</th><th>SD</th><th>N</th></tr>
<tr><td colspan="7">Critical (None)</td></tr>
<tr><td colspan="7">Important</td></tr>
<tr><td>Changes in mobility: Rosen score</td><td>1.96</td><td>0.56</td><td>11</td><td>1.51</td><td>0.62</td><td>9</td></tr>
<tr><td>Upper limb function: DASH questionnaire</td><td>20.34</td><td>17.68</td><td>11</td><td>27.84</td><td>23.35</td><td>9</td></tr>
</table>
</td>
<td>1.1 Was the allocation sequence random? Y - Randomization was based on a sequence of random numbers generated by Excel
1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? Y - Sequentially numbered opaque envelopes
1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? PY
Risk-of-bias judgement: Some concerns
• Domain 2: Risk of bias due to deviations from the intended interventions (effect of</td>
</tr>
</table>

Study details	Participants	Interventions	Outcomes and Results	Comments
• Recruitment: 2009 to 2011 **Source of funding** Fundação de Apoio ao Ensino, Pesquisa e Assistência (FAEPA) of Hospital das Clínicas, Faculdade de Medicina de Ribeirão Preto da Universidade de São Paulo (HCFMRP-USP), and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brazil	metabolic-degenerative diseases related to the peripheral or central nervous system.	discriminative way, adding the manipulation of small objects, all included in a similar home program. • All participants received a patient education booklet adapted from the manual “Sensory re-education” after nerve repair by Birgitta Rosén of Lund University, Sweden. • Follow-up: 3-6 months after nerve repair/surgery		**assignment to intervention)** 2.1. Were participants aware of their assigned intervention during the trial? NI 2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial? NI 2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? PN 2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups? NA 2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome? NA

Study details	Participants	Interventions	Outcomes and Results	Comments
				2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? Y 2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized? NA Risk-of-bias judgement: Low risk • **Domain 3: Missing outcome data** 3.1 Were data for this outcome available for all, or nearly all, participants randomized? N - Likely attrition bias due to amount of incomplete outcome data [20 out 32 patients completed the study]: at 6 month

Study details	Participants	Interventions	Outcomes and Results	Comments
				follow-up, assessments were 68% in the mirror therapy group and 56% of the control group 3.2 If N/PN/NI to 3.1: Is there evidence that the result was not biased by missing outcome data? N - The relatively high loss to follow up and absence of intention-to-treat analysis were likely to overestimate results 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? NI 3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value? NI Risk-of-bias judgement: High risk • **Domain 4: Risk of bias in**

Study details	Participants	Interventions	Outcomes and Results	Comments
				measurement of the outcome 4.1 Was the method of measuring the outcome inappropriate? N 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? N 4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants? PN 4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? NA 4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of

Study details	Participants	Interventions	Outcomes and Results	Comments
				intervention received? NA Risk-of-bias judgement: Low risk • **Domain 5: Risk of bias in selection of the reported result** 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? NI Is the numerical result being assessed likely to have been selected, on the basis of the results, from... 5.2. ... multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain? NI

Study details	Participants	Interventions	Outcomes and Results	Comments
				5.3 ... multiple analyses of the data? NI Risk-of-bias judgement Some concerns **Overall risk of bias** Risk-of-bias judgement: High risk **Other information:** None
Full citation Piccinini G, Cuccagna C, Caliandro P, Coraci D, Germanotta M, Pecchioli C, Padua, L. Efficacy of electrical stimulation of denervated muscle: a multicenter, double-blind, randomized clinical trial, Muscle & nerve, 61, 773-778, 2020 **Ref Id** 1285875	**Sample size** N=38 (38 patients with 76 randomised muscles) • ES: 38 • Sham: 38 N=38/76 (analysed) • ES: 38 • Sham: 38 **Characteristics** Age in years [Mean (SD)]: • ES/sham (same patients): 37 (21) Gender (M/F): • ES/sham (same patients) (n): 21/17 Injured Nerve: • ES/sham (same patients) (n) - Peronial: 23; ulnar: 9;	**Interventions** Each patient received real electrical stimulation (ES) to one muscle and sham ES to another muscle innervated by the same injured nerve. Which muscle received which treatment was randomly determined. • ES treatment: Triangular-rectangular stimuli of 150 ms duration, 1 Hz frequency, intensity 0.5 mA above lowest frequency for muscle contraction. • Sham ES treatment: Same parameters as ES, but intensity was	**Upper limb function** Segmental strength of targeted muscles (measured by MRC scale; mean (SD)): Change at end of treatment from baseline (N=36): ES: 0.9 (1.1) Sham: 0.9 (1.2) Change at 3 months after end of treatment from baseline (N=26): ES: 1.1 (1.4) Sham: 1.2 (1.5) Change at 3 months after end of treatment from end of treatment (N=26): ES: 0.3 (0.6) Sham: 0.3 (0.6) Segmental strength of targeted muscles (measured by dynamometry) Change at end of treatment from baseline (N=36): ES: 9.1 (12.3) Sham: 8.1 (16)	**Limitations** **Quality assessment:** Risk of bias assessed using revised Cochrane risk of bias tool (RoB 2) **Domain 1: Risk of bias arising from the randomization process** 1.1 Was the allocation sequence random? Y - Randomisation done by a randomizer centre that appeared to be different to the treating institutions

Study details	Participants	Interventions	Outcomes and Results	Comments
Country/ies where the study was carried out Italy **Study type** RCT **Aim of the study** "to investigate the efficacy of electrical stimulation of denervated muscle (ESDM) on recovery of patients with peripheral nerve injuries." (p. 773) **Study dates** Not reported **Source of funding** "The study was funded by Ministero della Salute (RF-FCG-2006-369322), Italy" (p. 773)	radial: 3; femoral: 2; tibial: 1 Muscles treated: • ES (n) – I dorsal interosseous: 3; abducti digiti minimi: 6; extensor digitorum cummunis: 1; brachioradialis: 2; vastus lateralis: 2; vastus medialis: 0; biceps femoris: 1; Gastrocnemius: 0; tibialis anterior: 9; peroneus longus: 14. • Sham (n) – I dorsal interosseous: 6; abducti digiti minimi: 3; extensor digitorum cummunis: 2; brachioradialis: 1; vastus lateralis: 0; vastus medialis: 2; biceps femoris: 0; Gastrocnemius: 1; tibialis anterior: 14; peroneus longus: 9. Mechanism of injury: • ES/sham (same patients) (n) – Road trauma: 9; domestic accident: 3; work accident: 1; other: 25 Mean time since injury (SD):	very low, corresponding to perceptual threshold of patient. Intensity of 1 mA used if stimulated area lacked sensation. All participants: Traditional "rehabilitation protocol of equal duration as appropriate for the level of strength of the targeted muscles, measured with the MRC scale (p. 774): - MRC scores 0-1: Exercises "to maintain residual muscle tone and trophism, exercises to prevent capsular and tendons retractions, postural exercises, and orthotic management." (p. 774) - MRC score ≥2: Exercises "for recruitment of larger synergistic muscles, accurate active muscle control, and reduction of compensation, neuromuscular synergy control, prevention of capsular and tendon retractions, and muscle strengthening and active	<u>Change at 3 months after end of treatment from baseline (N=26):</u> ES: 20.6 (34.5) Sham: 16 (25.2) <u>Change at 3 months after end of treatment from end of treatment (N=26):</u> ES: 11.1 (32.9) Sham: 7.7 (20.5) Number of sites with fibrillation potentials (out of 10 needle insertion points for each muscle) <u>Change at end of treatment from baseline (N=31):</u> ES: -2.2 (3.2) Sham: -2.2 (3.5) <u>Change at 3 months after end of treatment from baseline (N=24):</u> ES: -3.9 (4.1) Sham: -3.8 (4.1) <u>Change at 3 months after end of treatment from end of treatment (N=24):</u> ES: -2 (3) Sham: -1.1 (2.8)	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? Y – Randomisation communicated "directly to physiotherapist at each study center, so that the physician responsible for clinical and neurophysiological examinations was blinded to the type of treatment delivered" (p. 774) 1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? <u>PN</u> Risk-of-bias judgement: Low risk **Domain 2: Risk of bias due to deviations from**

Study details	Participants	Interventions	Outcomes and Results	Comments
	• ES/sham (same patients): 6.6 (8) months. **Inclusion criteria** Participants with "traumatic nerve axonal injury with clinical impairment of two muscles innervated by the affected nerve and complete or partial muscle denervation detected by neurophysiologic examination (presence of fibrillation potentials and/or positive sharp waves)." (p. 774) **Exclusion criteria** "conduction block, neurotmesis, and concurrent diseases affecting the peripheral nervous system." (p. 774)	mobilization." (p. 774) Treatment delivered in 90 min sessions, 3 times a week for 3 months to a total of 36 sessions. Each session consisted of 45 mins ES and sham ES simultaneously and 45 mins traditional rehabilitation. Each ES and sham ES session consisted of 3 10-min stimulation sequences with 5 mins in between.		**the intended interventions (effect of assignment to intervention)** 2.1. Were participants aware of their assigned intervention during the trial? PN 2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial? Y 2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? NI 2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups? NA 2.5 If N/PN/NI to 2.4: Were these deviations likely to

Study details	Participants	Interventions	Outcomes and Results	Comments
				have affected the outcome? NA 2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? Y 2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized? NA Risk-of-bias judgement: Low risk **Domain 3: Missing outcome data** 3.1 Were data for this outcome available for all, or nearly all, participants randomized? N - Likely attrition bias due to amount of incomplete outcome data [going from data

Study details	Participants	Interventions	Outcomes and Results	Comments
				available for 36/38 patients to data analysed for 24/38. 3.2 If N/PN/NI to 3.1: Is there evidence that the result was not biased by missing outcome data? N - The relatively high loss to follow up and absence of intention-to-treat analysis were likely to overestimate results 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? NI 3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value? NI Risk-of-bias judgement: High risk for outcomes reported at 3 months after completion of treatment, some concerns for the rest

Study details	Participants	Interventions	Outcomes and Results	Comments
				Domain 4: Risk of bias in measurement of the outcome 4.1 Was the method of measuring the outcome inappropriate? N 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? N 4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants? N 4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? NA 4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by

Study details	Participants	Interventions	Outcomes and Results	Comments
				knowledge of intervention received? NA Risk-of-bias judgement: Low risk **Domain 5: Risk of bias in selection of the reported result** 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? NI Is the numerical result being assessed likely to have been selected, on the basis of the results, from... 5.2. ... multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain? NI

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td></td><td>5.3 ... multiple analyses of the data? NI
Risk-of-bias judgement Some concerns
<u>Overall risk of bias</u>
Risk-of-bias judgement: High risk for outcomes reported at 3 months after completion of treatment, some concerns for the rest

Other information: None</td></tr>
<tr><td>Full citation
Rosen, B., Vikstrom, P., Turner, S., McGrouther, D. A., Selles, R. W., Schreuders, T. A. R., Bjorkman, A., Enhanced early sensory outcome after nerve repair as a result of immediate post-operative re-learning: a</td><td>Sample size
N=37 (randomised)
• Intervention: 19
• control: 18
N=27 (analysed)
• Intervention: 14
• control: 13

Characteristics
Age in years [Median (range)]:
• Intervention= 40 (19–63)
• Control= 41 (18–69)
Gender (M/F):</td><td>Interventions
• “Home-based training group” It consisted of mirror visual feedback (MVF)-training and the observation of touch combined with the general post-operative regime. Patients were provided with oral and written instructions on the exercises to be done at home 4–5 times a day in brief periods (maximum 10 min).</td><td>Results
<table>
<tr><td colspan="7">at 3 months after nerve repair/surgery</td></tr>
<tr><td rowspan="2">OUTCOME MEASURE</td><td colspan="3">INTERVENTION</td><td colspan="3">Control</td></tr>
<tr><td>MEAN</td><td>SD</td><td>N</td><td>Mean</td><td>SD</td><td>N</td></tr>
<tr><td colspan="7">Critical (None)</td></tr>
<tr><td colspan="7">Important</td></tr>
<tr><td>Changes in mobility: discriminative touch [shape texture identification test, part of the Rosen score]</td><td>0.05</td><td>0.12</td><td>15</td><td>0</td><td>0</td><td>14</td></tr>
<tr><td colspan="7">at 6 months after nerve repair/surgery</td></tr>
<tr><td></td><td colspan="3">INTERVENTION</td><td colspan="3">Control</td></tr>
</table></td><td>Limitations
Quality assessment: Risk of bias assessed using revised Cochrane risk of bias tool (RoB 2)
• Domain 1: Risk of bias arising from the randomization process
1.1 Was the allocation sequence random?</td></tr>
</table>

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr>
<td>randomized controlled trial, The Journal of hand surgery, European volume, 40, 598-606, 2015

Ref Id
948830

Country/ies where the study was carried out
Sweden, The Netherlands, UK

Study type
RCT

Aim of the study
This multicentre RCT was aimed to compare the effectiveness of two interventions, an early sensory and motor re-learning using mirror visual feedback and observation of touch starting the first week after surgery compared to a late re-learning (starting when reinnervation could</td>
<td>• Intervention (n): 6/9;
• Control (n): 14/0
Injured Nerve:
• Intervention (n) - Median: 3; Ulnar: 12; Combined: 0; Other: 0
• Control (n)- Median: 6; Ulnar: 8; Combined: 0; Other: 1
Mechanism of injury:
• Intervention (n) - Glass 11; Saw/knife: 3; Traffic accident 0; Other: 1
• Control (n)- Glass 7; Saw/knife: 3; Traffic accident: 3; Other: 1
•
Inclusion criteria
1) 18 to 70 years patients; 2) with acute complete median or ulnar nerve transections at the wrist or distal forearm level (maximum 10 cm proximal to the wrist) and 3) primary nerve repair within 1 week. Nerve injuries combined with injuries to tendons and vessels was also included.

Exclusion criteria</td>
<td>Observation of touch was implemented by synchronous touch of both hands, including the areas without sensibility.
• "General post-operative therapy group": During the immobilization period, a standard postoperative regime was followed to protect the repair site. Wound care, active range of motion exercises, grasping, fine manipulative exercises and prevention of contracture from paralysed muscles by splinting were started after the immobilization period or when appropriate for the injury. All patients were given information about hyperaesthesia and cold sensitivity. Desensitization exercises and advice about how to deal with cold sensitivity were provided when necessary."</td>
<td>
<table>
<tr><td>OUTCOME MEASURE</td><td>MEAN</td><td>SD</td><td>N</td><td>Mean</td><td>SD</td><td>N</td></tr>
<tr><td>Critical (None)</td><td colspan="6"></td></tr>
<tr><td>Important</td><td colspan="6"></td></tr>
<tr><td>Changes in mobility: discriminative touch [shape texture identification test, part of the Rosen score]</td><td>0.19</td><td>0.23</td><td>14</td><td>0.03</td><td>0.07</td><td>13</td></tr>
</table>
</td>
<td>Y - Randomization with a block size of eight per centre was applied
1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? Y - Sequentially numbered opaque envelopes
1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? PY
Risk-of-bias judgement: Some concerns
• Domain 2: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)
2.1. Were participants aware</td>
</tr>
</table>

Study details	Participants	Interventions	Outcomes and Results	Comments
be detected), for patients with a median or ulnar nerve injury **Study dates** • Recruitment: 2006 to 2011 **Source of funding** Swedish Research Council, (Medicine), the Faculty of Medicine, Lund University, Skåne University Hospital, the Trustfonds Rotterdam	1) reconstructive surgical procedures, including nerve tubes or grafts; 2) severe psychiatric disorders or drug problems; 3)self-inflicted injury; 4) nerve injuries at more than one level; 5) combined median and ulnar nerve injuries; 6) fractures or amputations; 7) and communication problems due to language difficulties			of their assigned intervention during the trial? N 2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial? Y 2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? PN 2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups? NA 2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome? NA 2.6 Was an appropriate analysis used to estimate the effect

Study details	Participants	Interventions	Outcomes and Results	Comments
				of assignment to intervention? Y 2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized? NA Risk-of-bias judgement: Low risk • **Domain 3: Missing outcome data** 3.1 Were data for this outcome available for all, or nearly all, participants randomized? N - Likely attrition bias due to amount of incomplete outcome data [10 out 37 patients completed the study]: at 6 month follow-up, assessments were 74% in the intervention group

Study details	Participants	Interventions	Outcomes and Results	Comments
				and 72% of the control group 3.2 If N/PN/NI to 3.1: Is there evidence that the result was not biased by missing outcome data? N - The relatively high loss to follow up and absence of intention-to-treat analysis were likely to overestimate results. 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? NI 3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value? NI Risk-of-bias judgement: High risk • **Domain 4: Risk of bias in measurement of the outcome** 4.1 Was the method of measuring the

Study details	Participants	Interventions	Outcomes and Results	Comments
				outcome inappropriate? N 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? N 4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants? Y 4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? PN 4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? NA Risk-of-bias judgement: Low risk

Study details	Participants	Interventions	Outcomes and Results	Comments
				• **Domain 5: Risk of bias in selection of the reported result** 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? NI Is the numerical result being assessed likely to have been selected, on the basis of the results, from... 5.2. ... multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain? NI 5.3 ... multiple analyses of the data? NI Risk-of-bias judgement Some concerns

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td></td><td><u>Overall risk of bias</u>
Risk-of-bias judgement: High risk</td></tr>
<tr><td>Full citation
Rostami, Hamid Reza, Akbarfahimi, Malahat, Hassani Mehraban, Afsoon, Akbarinia, Ali Reza, Samani, Susan, Occupation-based intervention versus rote exercise in modified constraint-induced movement therapy for patients with median and ulnar nerve injuries: a randomized controlled trial, Clinical rehabilitation, 31, 1087-1097, 2017

Ref Id
948834

Country/ies where the study was carried out
Iran
Study type</td><td>Sample size
N=36 (randomised)
• Intervention (1): 12
• Intervention (2): 12
• control: 12
N=36 (analysed)
• Intervention (1): 12
• Intervention (2): 12
• control: 12
Characteristics
Age in years [Mean (SD)]:
• Intervention (1)= 31,0 (8,0);
• Intervention (2)= 39,0 (10.0);
• Control= 34,0 (6,0)
Gender (M/F):
• Intervention 1 (n): 8/4;
• Intervention 2 (n): 9/3;
• Control (n): 8/2
Injured Nerve:
• Intervention 1 (n) - Median: 4; Ulnar: 2; Combined: 6; Other: 0;</td><td>Interventions
• INTERVENTION 1"Occupation-based group": The intervention protocol consisted of three hours of intensive hand training on even days of the week for four weeks, in association with the immobilisation of the healthy hand during therapy and during the 6 hours of top hand use at home by a resting splint which restricted wrist and fingers movements. The occupational therapist that implemented intervention programs for all participants was informed just about the top occupational priorities in this group based on Canadian occupational performance measure. Occupational therapist</td><td>Results
<table>
<tr><td colspan="7">at 1 month after from intervention completition</td></tr>
<tr><td rowspan="2">OUTCOME MEASURE</td><td colspan="3">INTERVENTION 1- Occupation-based group</td><td colspan="3">Control</td></tr>
<tr><td>MEAN</td><td>95 %CI</td><td>N</td><td>Mean</td><td>95 %CI</td><td>N</td></tr>
<tr><td colspan="7">Critical</td></tr>
<tr><td>Changes in activity of daily living: Canadian occupational performance measure-Performance</td><td>7.2</td><td>[6.6 – 7.7]</td><td>12</td><td>3.6</td><td>[3.0 – 4.2]</td><td>12</td></tr>
<tr><td>Patient acceptability: Canadian occupational performance measure-Satisfaction</td><td>6.9</td><td>[6.5 – 7.3]</td><td>12</td><td>3.2</td><td>[2.7 – 3.7]</td><td>12</td></tr>
<tr><td colspan="7">Important</td></tr>
<tr><td>Changes in mobility: Box & Block test</td><td>10.1</td><td>[9.2 –</td><td>12</td><td>3.2</td><td>[2.2 – 4.2]</td><td>12</td></tr>
</table></td><td>Limitations Quality assessment: Risk of bias assessed using revised Cochrane risk of bias tool (RoB 2)
• Domain 1: Risk of bias arising from the randomization process
1.1 Was the allocation sequence random? NI
1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? Y
1.3 Did baseline differences between intervention groups suggest a problem</td></tr>
</table>

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr>
<td>RCT

Aim of the study
This RCT was aimed to compare the effectiveness of three interventions, an occupation-based group, rote exercise-based group and a control group, in patients with median and ulnar nerve injuries.

Study dates
• Publication date: 2017
• Recruitment: N/R

Source of funding
None</td>
<td>• Intervention 2 (n) - Median: 4; Ulnar: 3; Combined: 5; Other: 0
• Control (n)- Median: 3; Ulnar: 2; Combined: 5; Other: 2
Mechanism of injury:
• N/R. It is only stated "Etiologies of nerve injury included bone fractures, motor vehicle accidents, laceration by sharp tools such as knife and etc."
•
Inclusion criteria
Patients with: 1) a first unilateral median, ulnar, or combined nerve injury and repair at forearm or lower levels, (2) time since injury and repair at least six months; (3) functional passive range of motion in the affected hand (15–20 degrees extension and 5–10 degrees flexion at wrist joint, 30–45 degrees flexion at metacarpophalangeal and interphalangeal joints) and; (4)</td>
<td>and participants together. All preparatory treatment techniques such as stretching or strengthening, if required, were integrated into the therapeutic occupations.
• INTERVENTION 2 “Rote exercise-based group”: The training hours and immobilisation period were same as occupation-based group except performing intervention in odd days of the week. Occupational therapist knew nothing about the interests and occupational priorities of this group; so, sensory and motor re-education programs were determined considering the present abilities, capabilities, and impairments of the participants by the occupational therapist.
• Control group performed different activities with affected hand for 1.5-hour each</td>
<td>
<table>
<tr><td></td><td></td><td>11.0]</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Upper limb function: DASH questionnaire</td><td>19.6</td><td>[15.8–23.3]</td><td>12</td><td>53.9</td><td>[49.8–58]</td><td>12</td></tr>
<tr><td colspan="7">at 1 month after from intervention completion</td></tr>
<tr><td rowspan="2">OUTCOME MEASURE</td><td colspan="3">INTERVENTION 2- Rote exercise-based group</td><td colspan="3">Control</td></tr>
<tr><td>MEAN</td><td>95 %CI</td><td>N</td><td>Mean</td><td>95 %CI</td><td>N</td></tr>
<tr><td colspan="7">Critical</td></tr>
<tr><td>Changes in activity of daily living: Canadian occupational performance measure-Performance</td><td>4.9</td><td>[4.4 – 5.5]</td><td>12</td><td>3.6</td><td>[3.0 – 4.2]</td><td>12</td></tr>
<tr><td>Patient acceptability: Canadian occupational performance measure-Satisfaction</td><td>4.5</td><td>[4.1 – 4.9]</td><td>12</td><td>3.2</td><td>[2.7 – 3.7]</td><td>12</td></tr>
<tr><td colspan="7">Important</td></tr>
<tr><td>Changes in mobility: Box & Block test</td><td>5.2</td><td>[4.2 – 6.1]</td><td>12</td><td>3.6</td><td>[3.0 – 4.2]</td><td>12</td></tr>
</table>
</td>
<td>with the randomization process? PY
Risk-of-bias judgement: Some concerns
• Domain 2: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)
2.1. Were participants aware of their assigned intervention during the trial? NI
2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial? PY
2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? PN</td>
</tr>
</table>

Study details	Participants	Interventions	Outcomes and Results	Comments
	age between 18–60 years old. **Exclusion criteria** Patients with: 1) bilateral injury, brachial plexus lesion, shoulder or elbow problems, rheumatologic diseases, or complex regional pain syndrome; 2) any surgery during the study period, burned hands, unhealed bone fractures and tendon ruptures, or neurological diseases	day during 4-week without restriction of healthy hand. Same as the other two groups, training program included two integrated parts, sensory and motor re-education simultaneously, without the presence of the therapist.	Upper limb function: DASH questionnaire | 37.4 | [33.6–41.2] | 12 | 3.2 | [2.7 – 3.7] | 12	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups? NA 2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome? NA 2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? Y 2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized? NA Risk-of-bias judgement: Low risk • **Domain 3: Missing outcome data**

Study details	Participants	Interventions	Outcomes and Results	Comments
				3.1 Were data for this outcome available for all, or nearly all, participants randomized? Y 3.2 If N/PN/NI to 3.1: Is there evidence that the result was not biased by missing outcome data? NA 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? NA 3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value? NA Risk-of-bias judgement: Low risk • **Domain 4: Risk of bias in measurement of the outcome** 4.1 Was the method of measuring the outcome inappropriate? N

Study details	Participants	Interventions	Outcomes and Results	Comments
				4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? N 4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants? PY 4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? PN 4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? NA Risk-of-bias judgement: Low risk • **Domain 5: Risk of bias in**

Study details	Participants	Interventions	Outcomes and Results	Comments
				selection of the reported result 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? NI Is the numerical result being assessed likely to have been selected, on the basis of the results, from... 5.2. ... multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain? NI 5.3 ... multiple analyses of the data? NI Risk-of-bias judgement: Some concerns

Study details	Participants	Interventions	Outcomes and Results	Comments
				Overall risk of bias Risk-of-bias judgement: High risk

DASH: disabilities of the arm, shoulder and hand; F: Female; M: Male; N: number [or No if answering a risk of bias checklist question]; SD: Standard deviation; SWM: Semmes-Weinstein monofilament; TAU: Treatment as usual; RCT: Randomised controlled trial

Clinical evidence tables for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No evidence was identified which was applicable to this review question.

Appendix E – Forest plots

Forest plots for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No meta-analyses were performed as the interventions or outcomes were either not sufficiently similar to allow them to be combined or they were not reported by more than one study

Forest plots for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No evidence was identified which was applicable to this review question.

Appendix F – GRADE tables

GRADE tables for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Table 7: Clinical evidence profile for early sensory re-education (based on mirror therapy) versus conventional rehabilitation therapy for adults with complex rehabilitation needs after traumatic injury that involves nerve injury

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Early sensory re-education (based on mirror therapy)	conventional rehabilitation therapy	Relative (95% CI)	Absolute		
Changes in mobility: Rosen score - at 3 months after nerve repair/surgery (scores 1-3; better indicated by higher values)												
1 (Paula 2016)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	11	9	-	MD 0.03 higher (0.42 lower to 0.48 higher)	VERY LOW	IMPORTANT
Changes in mobility: Rosen score - at 6 months after nerve repair/surgery (scores: 1-3; better indicated by higher values)												
1 (Paula 2016)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	serious[3]	none	11	9	-	MD 0.45 higher (0.07 lower to 0.97 higher)	VERY LOW	IMPORTANT
Upper limb function: DASH questionnaire - at 3 months after nerve repair/surgery (scores 0-100; better indicated by lower values)												
1 (Paula 2016)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	serious[4]	none	11	9	-	MD 14.37 lower (35.76 lower to 7.02 higher)	VERY LOW	IMPORTANT
Upper limb function: DASH questionnaire - at 6 months after nerve repair/surgery (scores 0-100; better indicated by lower values)												
1 (Paula 2016)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	serious[4]	none	11	9	-	MD 7.5 lower (25.99 lower to 10.99 higher)	VERY LOW	IMPORTANT

CI: Confidence interval; DASH: Disabilities of the Arm, Shoulder and Hand; MID: minimal important difference; MD: Mean difference
1 Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
2 95% CI crosses 2 MIDs (MID boundaries -0.26, +0.26)
3 95% CI crosses 1 MID (MID boundaries -0.26, +0.26)
4 95% CI crosses 1 MID (MID boundaries -13.83, +13.83)

Table 8: Clinical evidence for enhanced early sensory re-education (consisting of mirror visual feedback-training and the observation of touch) + conventional rehabilitation regime versus conventional rehabilitation therapy for adults with complex rehabilitation needs after traumatic injury that involves nerve injury

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Enhanced early sensory re-education (consisting of mirror visual feedback-training and the observation of touch) + conventional rehabilitation regime	Conventional rehabilitation therapy	Relative (95% CI)	Absolute		
Changes in mobility: discriminative touch [shape texture identification test, part of the Rosen score] - at 3 months after nerve repair/surgery (scores 0-1; better indicated by higher values)												
1 (Rosen 2015)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	15	14	-	MD 0.05 higher (0.04 lower to 0.14 higher)	VERY LOW	IMPORTANT
Changes in mobility: discriminative touch [shape texture identification test, part of the Rosen score] - at 6 months after nerve repair/surgery (scores 0-1; better indicated by higher values)												
1 (Rosen 2015)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	14	13	-	MD 0.16 higher (0.03 to 0.29 higher)	VERY LOW	IMPORTANT

CI: Confidence interval; MID: minimal important difference; MD: Mean difference
1 Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
2 Confidence intervals crosses 1 MID. (-0.03, +0.03)

Table 9: Clinical evidence for touch-observation and task-based mirror therapy + hand therapy + physiotherapy versus classical sensory re-education + hand therapy + physiotherapy for adults with complex rehabilitation needs after traumatic injury that involves nerve injury

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Touch-observation and task-based mirror therapy + hand therapy + physiotherapy	Classical sensory re-education + hand therapy + physiotherapy	Relative (95% CI)	Absolute		
Upper limb function: Perdue Pegboard Test unilateral pin insertion after treatment (Better indicated by higher values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 0.9 higher (3 lower to 4.8 higher)	VERY LOW	IMPORTANT

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Touch-observation and task-based mirror therapy + hand therapy + physiotherapy	Classical sensory re-education + hand therapy + physiotherapy	Relative (95% CI)	Absolute		
Upper limb function: Perdue Pegboard Test unilateral pin insertion 12 weeks after treatment (Better indicated by higher values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 1.3 higher (2.76 lower to 5.36 higher)	VERY LOW	IMPORTANT
Upper limb function: Perdue Pegboard Test bilateral pin insertion after treatment (Better indicated by higher values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 0.4 higher (2.91 lower to 3.71 higher)	VERY LOW	IMPORTANT
Upper limb function: Perdue Pegboard Test bilateral pin insertion 12 weeks after treatment (Better indicated by higher values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 1.6 higher (2.87 lower to 6.07 higher)	VERY LOW	IMPORTANT
Upper limb function: Perdue Pegboard Test assembly after treatment (Better indicated by higher values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 0.7 higher (9.73 lower to 11.13 higher)	VERY LOW	IMPORTANT
Upper limb function: Perdue Pegboard Test assembly 12 weeks after treatment (Better indicated by higher values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 2.4 higher (8.7 lower to 13.5 higher)	VERY LOW	IMPORTANT
Upper limb function: Minnesota Manual Dexterity Test placing after treatment (Better indicated by lower values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 10.5 lower (50.22 lower to 29.22 higher)	VERY LOW	IMPORTANT
Upper limb function: Minnesota Manual Dexterity Test placing 12 weeks after treatment (Better indicated by lower values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 22.5 lower (56.98 lower to 11.98 higher)	VERY LOW	IMPORTANT
Upper limb function: Minnesota Manual Dexterity Test turning after treatment (Better indicated by lower values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 10.2 higher (31.78 lower to 52.18 higher)	VERY LOW	IMPORTANT
Upper limb function: Minnesota Manual Dexterity Test turning 12 weeks after treatment (Better indicated by lower values)												
1 (Hsu 2019)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	none	6	5	-	MD 4.3 lower (39.85 lower to 31.25 higher)	VERY LOW	IMPORTANT

CI: Confidence interval; MID: minimal important difference; MD: Mean difference
1 Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
2 Confidence intervals crosses 2 MIDs (Perdue Pegboard test unilateral pin insertion +/-1.45; Perdue Pegboard test bilateral pin insertion +/-1.25; Perdue Pegboard test assembly +/-3.6; Minnesota Manual Dexterity test placing +/-26.85; Minnesota Manual Dexterity test turning +/-18.5)

Table 10: Clinical evidence for modified constraint-induced movement therapies versus conventional rehabilitation therapy for adults with complex rehabilitation needs after traumatic injury that involves nerve injury

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Modified constraint-induced movement therapy	Conventional rehabilitation therapy	Relative (95% CI)	Absolute		
Changes in activity of daily living: Canadian occupational performance measure - Performance (at 1 month after intervention completion) - Occupation-based rehabilitation therapy (scores 1-10; better indicated by higher values)												
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 3.6 higher (2.84 to 4.36 higher)	LOW	CRITICAL
Changes in activity of daily living: Canadian occupational performance measure - Performance (at 1 month after intervention completion) - Rote exercise-based rehabilitation therapy (b scores 1-10; better indicated by higher values)												
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 1.3 higher (0.6 to 2 higher)	LOW	CRITICAL
Patient acceptability: Canadian occupational performance measure - Satisfaction (at 1 month after intervention completion) - Occupation-based rehabilitation therapy (scores 1-10; better indicated by higher values)												
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 3.7 higher (3.13 to 4.27 higher)	LOW	CRITICAL
Patient acceptability: Canadian occupational performance measure - Satisfaction (at 1 month after intervention completion) - Rote exercise-based rehabilitation therapy (scores 1-10; better indicated by higher values)												
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 1.3 higher (0.73 to 1.87 higher)	LOW	CRITICAL
Changes in mobility: Box & Block test (at 1 month after intervention completion) - Occupation-based rehabilitation therapy (Better indicated by higher values)												
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 6.9 higher (5.98 to 7.82 higher)	LOW	IMPORTANT
Changes in mobility: Box & Block test (at 1 month after intervention completion) - Rote exercise-based rehabilitation therapy (Better indicated by higher values)												
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 2 higher (1 to 3 higher)	LOW	IMPORTANT
Upper limb function: DASH questionnaire (at 1 month after intervention completion) - Occupation-based rehabilitation therapy (Better indicated by lower values)												
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 34.3 lower (43.96 to 24.64 lower)	LOW	IMPORTANT
Upper limb function: DASH questionnaire (at 1 month after intervention completion) - Rote exercise-based rehabilitation therapy (Better indicated by lower values)												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Modified constraint-induced movement therapy	Conventional rehabilitation therapy	Relative (95% CI)	Absolute		
1 (Rostami 2017)	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	12	12	-	MD 16.5 lower (21.48 to 11.52 lower)	LOW	IMPORTANT

CI: Confidence interval; DASH: Disabilities of the Arm, Shoulder and Hand; MID: minimal important difference; MD: Mean difference
1 Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2

Table 11: Clinical evidence for electrical stimulation + traditional rehabilitation versus sham stimulation + traditional rehabilitation for adults with complex rehabilitation needs after traumatic injury that involves nerve injury

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Electrical stimulation + traditional rehabilitation	Sham stimulation + traditional rehabilitation	Relative (95% CI)	Absolute		
Upper limb function: Segmental strength of targeted muscles (MRC scale) change at end of treatment from baseline (Better indicated by higher values)												
1 (Piccinini 2020)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	36	36	-	MD 0 higher (0.53 lower to 0.53 higher)	MODERATE	IMPORTANT
Upper limb function: Segmental strength of targeted muscles (MRC scale) change at 3 months after end of treatment from baseline (Better indicated by higher values)												
1 (Piccinini 2020))	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	26	26	-	MD 0.1 lower (0.89 lower to 0.69 higher)	VERY LOW	IMPORTANT
Upper limb function: Segmental strength of targeted muscles (MRC scale) change at 3 months after end of treatment from treatment end (Better indicated by higher values)												
1 (Piccinini 2020)	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	26	26	-	MD 0 higher (0.33 lower to 0.33 higher)	LOW	IMPORTANT
Upper limb function: Segmental strength of targeted muscles (dynamometry) change at end of treatment from baseline (Better indicated by higher values)												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Electrical stimulation + traditional rehabilitation	Sham stimulation + traditional rehabilitation	Relative (95% CI)	Absolute		
1 (Piccinini 2020)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	36	36	-	MD 1 higher (5.59 lower to 7.59 higher)	MODERATE	IMPORTANT
Upper limb function: Segmental strength of targeted muscles (dynamometry) change at 3 months after end of treatment from baseline (Better indicated by higher values)												
1 (Piccinini 2020)	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	26	26	-	MD 4.6 higher (11.82 lower to 21.02 higher)	VERY LOW	IMPORTANT
Upper limb function: Segmental strength of targeted muscles (dynamometry) change at 3 months after end of treatment from treatment end (Better indicated by higher values)												
1 (Piccinini 2020)	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	26	26	-	MD 3.4 higher (11.5 lower to 18.3 higher)	VERY LOW	IMPORTANT
Upper limb function: Number of sites with fibrillation potentials change at end of treatment from baseline (Better indicated by higher values)												
1 (Piccinini 2020)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[3]	none	31	31	-	MD 0 higher (1.67 lower to 1.67 higher)	VERY LOW	IMPORTANT
Upper limb function: Number of sites with fibrillation potentials change at 3 months after end of treatment from baseline (Better indicated by higher values)												
1 (Piccinini 2020)	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	24	24	-	MD 0.1 lower (2.42 lower to 2.22 higher)	VERY LOW	IMPORTANT
Upper limb function: Number of sites with fibrillation potentials change at 3 months after end of treatment from end of treatment (Better indicated by higher values)												
1 (Piccinini 2020)	randomised trials	very serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	24	24	-	MD 0.9 lower (2.54 lower to 0.74 higher)	VERY LOW	IMPORTANT

CI: Confidence interval; MID: minimal important difference; MD: Mean difference; MRC: Medical Research Council
1 Serious risk of bias in the evidence contributing to the outcomes as per RoB 2
2 Very serious risk of bias in the evidence contributing to the outcomes as per RoB 2
3 Confidence intervals crosses 2 MIDs (Segmental strength MRC scale +/-0.65; Segmental strength dynamometry +/-8.25; fibrillation potentials +/-1.55)

GRADE tables for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No evidence was identified which was applicable to this review question.

Appendix G – Economic evidence study selection

Economic study selection for:

C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

A combined search was conducted for both review questions.

Figure 3: Study selection flow chart: Adults

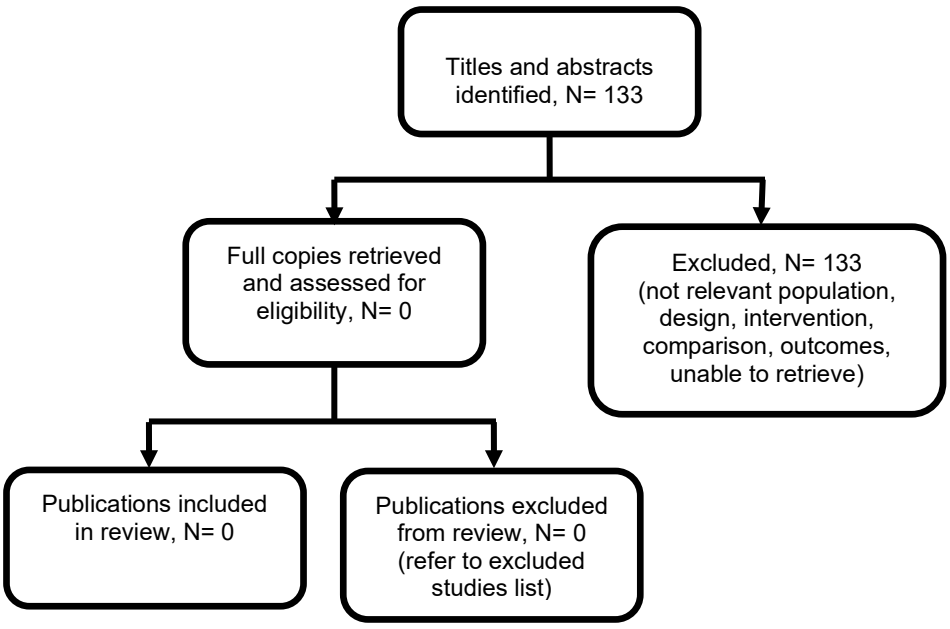
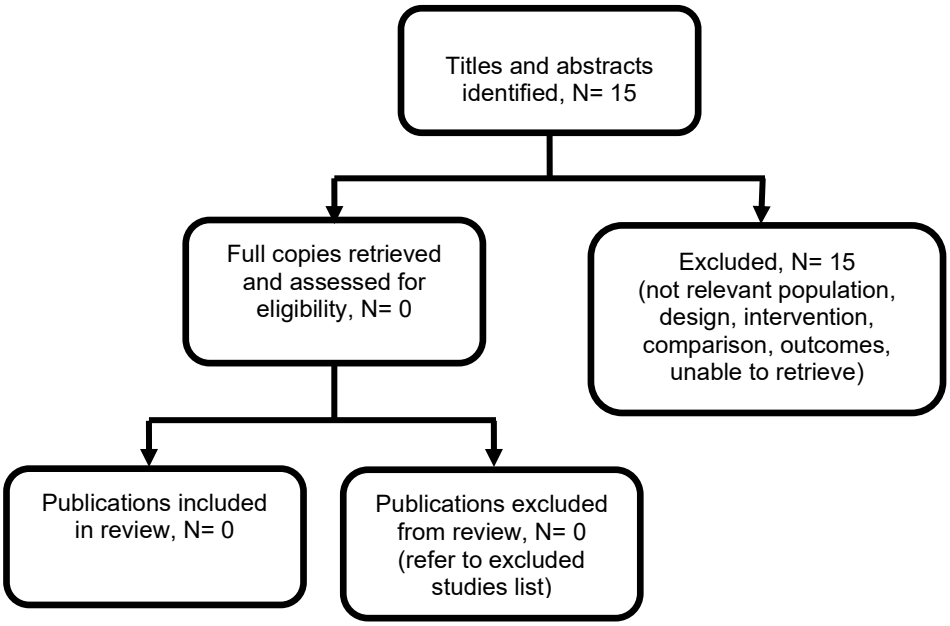


Figure 4: Study selection flow chart: Children and young people



Appendix H – Economic evidence tables

Economic evidence tables for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No economic studies were identified which were applicable to this review question.

Economic evidence tables for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No economic studies were identified which were applicable to this review question.

Appendix I – Economic evidence profiles

Economic evidence tables for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No economic studies were identified which were applicable to this review question.

Economic evidence profiles for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No economic studies were identified which were applicable to this review question.

Appendix J – Economic analysis

Economic evidence analysis for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No economic analysis was undertaken for this review question.

Economic evidence tables for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No economic analysis was undertaken for this review question

Appendix K – Excluded studies

Excluded clinical and economic studies for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Clinical studies

Table 12: Excluded studies and reasons for their exclusion

Study	Reason for Exclusion
Abrahams, M. S., Aziz, M. F., Fu, R. F., Horn, J. L., Ultrasound guidance compared with electrical neurostimulation for peripheral nerve block: A systematic review and meta-analysis of randomized controlled trials, British Journal of Anaesthesia, 102, 408-417, 2009	Population not in PICO: No nerve injury
Adiguzel, Emre, Yasar, Evren, Tecer, Duygu, Guzelkucuk, Umut, Taskaynatan, Mehmet Ali, Kesikburun, Serdar, Ozgul, Ahmet, Peripheral nerve injuries: Long term follow-up results of rehabilitation, Journal of back and musculoskeletal rehabilitation, 29, 367-371, 2016	Comparison not in PICO: This retrospective (comparative) study including 112 patients with different nerve injuries. The focus is on comparing different group of nerve injury according to their etiology (e.g. Gunshot wound; Penetrating trauma; and Crash injury) rather then for rehabilitation needs/interventions.
Bedigrew, K. M., Patzkowski, J. C., Wilken, J. M., Owens, J. G., Blanck, R. V., Stinner, D. J., Kirk, K. L., Hsu, J. R., Can an Integrated Orthotic and Rehabilitation Program Decrease Pain and Improve Function After Lower Extremity Trauma?, Clinical Orthopaedics and Related Research, 472, 3017-3025, 2014	Not comparative study
Cardoso, J. R., Teixeira, E. C., Moreira, M. D., Favero, F. M., Fontes, S. V., Bulle De Oliveira, A. S., Effects of exercises on bell's palsy: Systematic review of randomized controlled trials, Otology and Neurotology, 29, 557-560, 2008	Narrative review (references have been checked for relevant studies - none were identified)
Chan, R. K., Splinting for peripheral nerve injury in upper limb, Hand surgery : an international journal devoted to hand and upper limb surgery and related research : journal of the Asia-Pacific Federation of Societies for Surgery of the Hand, 7, 251-259, 2002	Narrative review (references have been checked for relevant studies - none were identified)
Cheng, A. L., Yu, H., Jiang, L., Yuan, W. F., Changes in the electromyogram of transcutaneous electrical nerve stimulator accelerating peripheral neural regeneration, Chinese Journal of Clinical Rehabilitation, 8, 5598â□□5599, 2004	Article in Chinese
Cook, A. C., Szabo, R. M., Birkholz, S. W., King, E. F., Early mobilization following carpal tunnel release: A prospective randomized study, Journal of Hand Surgery, 20 B, 228-230, 1995	Population not in PICO: Splinting following surgery in patients with Carpal tunnel syndrome
D'Angelo, Kevin, Sutton, Deborah, Cote, Pierre, Dion, Sarah, Wong, Jessica J., Yu, Hainan, Randhawa, Kristi, Southerst, Danielle, Varatharajan, Sharanya,	Systematic review (references have been checked for relevant studies - none were identified)

Study	Reason for Exclusion
Cox Dresser, Jocelyn, Brown, Courtney, Menta, Roger, Nordin, Margareta, Shearer, Heather M., Ameis, Arthur, Stupar, Maja, Carroll, Linda J., Taylor-Vaisey, Anne, The effectiveness of passive physical modalities for the management of soft tissue injuries and neuropathies of the wrist and hand: a systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) collaboration, Journal of manipulative and physiological therapeutics, 38, 493-506, 2015	
Eccleston, C., Hearn, L., Williams, Acdc, Psychological therapies for the management of chronic neuropathic pain in adults, Cochrane Database of Systematic Reviews, 2015	Population not in PICO: Patients experiencing a range of chronic neuropathic pain conditions
Fonseca, M., Scheucher, D., Queiroz, V., Holtz, M., Magnani, P., Rodrigues, E., Barbosa, R., Elui, V., Proposal of hand sensory reeducation program in peripheral nerve injuries: preliminary randomized controlled trial, Physiotherapy (united kingdom)., 97, eS350, 2011	Published as conference abstract only; not enough information available
Forogh, Bijan, Aslanpour, Hossein, Fallah, Ehsan, Babaei-Ghazani, Arash, Ebadi, Safoora, Adding high-frequency transcutaneous electrical nerve stimulation to the first phase of post anterior cruciate ligament reconstruction rehabilitation does not improve pain and function in young male athletes more than exercise alone: a randomized single-blind clinical trial, Disability and Rehabilitation, 1-9, 2017	Intervention not in PICO: transcutaneous electrical nerve stimulation (TENS)
Glinsky, Joanne, Harvey, Lisa, Van Es, Pauline, Efficacy of electrical stimulation to increase muscle strength in people with neurological conditions: a systematic review, Physiotherapy research international : the journal for researchers and clinicians in physical therapy, 12, 175-94, 2007	Systematic review (references have been checked for relevant studies - none were identified)
Gordon, Tessa, Amirjani, Nasim, Edwards, David C., Chan, K. Ming, Brief post-surgical electrical stimulation accelerates axon regeneration and muscle reinnervation without affecting the functional measures in carpal tunnel syndrome patients, Experimental neurology, 223, 192-202, 2010	Population not in PICO: Carpal tunnel syndrome
Henriquez, Hugo, Munoz, Roberto, Carcuro, Giovanni, Bastias, Christian, Is percutaneous repair better than open repair in acute Achilles tendon rupture?, Clinical Orthopaedics and Related Research, 470, 998-1003, 2012	Intervention not in PICO: Percutaneous repair versus open repair in acute Achilles tendon rupture
Henry, F. P., Farkhad, R. I., Butt, F. S., O'Shaughnessy, M., O'Sullivan, S. T., A comparison between complete immobilisation and protected active mobilisation in sensory nerve recovery following isolated digital nerve injury, The Journal of hand surgery, European volume, 37, 422-6, 2012	No comparative study
Hultman, C. S., Wu, C., Krochmal, D., Calvert, C., Under pressure: Elective peripheral nerve decompression after burn injury and comparison of patients with electrical versus non-electrical etiologies, Journal of Burn Care and Research, 33, S105, 2012	Published as conference abstract only; not enough information available

Study	Reason for Exclusion
Huygen, F. J. P. M., Kallewaard, J. W., Nijhuis, H., Liem, L., Vesper, J., Fahey, M. E., Blomme, B., Morgalla, M. H., Deer, T. R., Capobianco, R. A., Effectiveness and Safety of Dorsal Root Ganglion Stimulation for the Treatment of Chronic Pain: A Pooled Analysis, Neuromodulation, 23, 213-221, 2020	Systematic review, included studies checked for relevance
Infante-Cossio, P., Prats-Golczer, V. E., Lopez-Martos, R., Montes-Latorre, E., Exposito-Tirado, J. A., Gonzalez-Cardero, E., Effectiveness of facial exercise therapy for facial nerve dysfunction after superficial parotidectomy: a randomized controlled trial, Clinical rehabilitation, 30, 1097-1107, 2016	Population not in PICO: None had nerve injury
Jackson, Gillian, Sinclair, Victoria F., McLaughlin, Charles, Barrie, James, Outcomes of functional weight-bearing rehabilitation of Achilles tendon ruptures, Orthopedics, 36, e1053-9, 2013	No comparative study
Jaquet, J. B., Luijsterburg, A. J., Kalmijn, S., Kuypers, P. D., Hofman, A., Hovius, S. E., Median, ulnar, and combined median-ulnar nerve injuries: functional outcome and return to productivity, The Journal of trauma, 51, 687-92, 2001	Comparison not in PICO: This study describes and compares outcomes after median, ulnar, or combined median-ulnar nerve injuries
Liu, G. F., Zhou, Z. X., Effect of neuromuscular electrical stimulation in various modes on the rehabilitation of upper limb function in patients with hemiplegia, Chinese Journal of Clinical Rehabilitation, 8, 4424â□□4425, 2004	Article in Chinese
Lundborg, G., Rosen, B., Hand function after nerve repair, Acta physiologica (Oxford, England), 189, 207-17, 2007	Narrative review (references have been checked for relevant studies - none were identified)
Meadows, R., McMillan, K., Batka, R., Brown, T., Sengelaub, D., Jones, K., Electrical stimulation enhances functional recovery after sciatic nerve injury, FASEB Journal, 28, 2014	Published as conference abstract only; not enough information available
Nct,, Effects of Early Sensory Reeducation Programs Using Mirror Therapy for Patients With Peripheral Nerve Injuries, Https://clinicaltrials.gov/show/nct02768857, 2016	Study protocol
Nct,, Sensory Reeducation in Peripheral Nerve Injuries of Hand, Https://clinicaltrials.gov/show/nct01215760, 2010	Study protocol
Nct,, Non-operative Treatment of Acute Achilles Tendon Rupture Using Dynamic Rehabilitation. Influence of Early Weight-bearing Compared With Non-weight-bearing, Https://clinicaltrials.gov/show/nct01470833, 2011	Population not in PICO: Non-operative Treatment of Acute Achilles Tendon Rupture
Nct,, Electrical Stimulation to Enhance Peripheral Nerve Regeneration, Https://clinicaltrials.gov/show/nct02403661, 2015	Study protocol
Novak, Christine B., Rehabilitation strategies for facial nerve injuries, Seminars in plastic surgery, 18, 47-52, 2004	Narrative review (references have been checked for relevant studies - none were identified)
Novak, Christine B., von der Heyde, Rebecca L., Evidence and techniques in rehabilitation following nerve injuries, Hand Clinics, 29, 383-92, 2013	Narrative review (references have been checked for relevant studies - none were identified)

Study	Reason for Exclusion
Paula, M. H., Barbosa, R. I., Marcolino, A. M., Elui, V. M., Rosen, B., Fonseca, M. C., Early sensory re-education of the hand after peripheral nerve repair based on mirror therapy: a randomized controlled trial, Brazilian journal of physical therapy, 20, 58â€65, 2016	Duplicate
Robinson, Michael D., Shannon, Steven, Rehabilitation of peripheral nerve injuries, Physical Medicine and Rehabilitation Clinics of North America, 13, 109-35, 2002	Narrative review (references have been checked for relevant studies - none were identified)
Rosberg, H. E., Carlsson, K. S., Hojgard, S., Lindgren, B., Lundborg, G., Dahlin, L. B., Injury to the human median and ulnar nerves in the forearm - Analysis of costs for treatment and rehabilitation of 69 patients in southern Sweden, Journal of Hand Surgery, 30, 35-39, 2005	Not comparative study
Salerno, Grazia, Cavaliere, Matteo, Foglia, Alessandra, Pellicoro, Dora Parente, Mottola, Giampiero, Nardone, Massimiliano, Galli, Vieri, The 11th nerve syndrome in functional neck dissection, The Laryngoscope, 112, 1299-307, 2002	Population not in PICO Patients who have undergone functional neck dissection associated with total laryngectomy
Schmidt,R.A., Jonas,U., Oleson,K.A., Janknegt,R.A., Hassouna,M.M., Siegel,S.W., van Kerrebroeck,P.E., Sacral nerve stimulation for treatment of refractory urinary urge incontinence. Sacral Nerve Stimulation Study Group, Journal of Urology, 162, 352-357, 1999	Population not in PICO: Urinary incontinence
Targan, R. S., Alon, G., Kay, S. L., Effect of long-term electrical stimulation on motor recovery and improvement of clinical residuals in patients with unresolved facial nerve palsy, Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery, 122, 246-52, 2000	Not comparative study
Toffola, E. D., Tinelli, C., Lozza, A., Bejor, M., Pavese, C., Degli Agosti, I., Petrucci, L., Choosing the best rehabilitation treatment for bell's palsy, European Journal of Physical and Rehabilitation Medicine, 48, 635-642, 2012	This retrospective cohort study included 102 patients with idiopathic facial palsy, none had nerve injury
Vipond, Nicole, Taylor, William, Rider, Mark, Postoperative splinting for isolated digital nerve injuries in the hand, Journal of hand therapy : official journal of the American Society of Hand Therapists, 20, 222-231, 2007	Outcomes not in PICO
Wang, O. Y., Murchison, A. P., Hark, L. A., Leiby, B. T., Siraj, S., Kale, S., Kim, D., Shair, K., Sergott, R., Moster, M., Donoso, L., Bilyk, J. R., Haller, J. A., A prospective, randomized clinical trial evaluating the effect of transcorneal electrical stimulation on visual function, Investigative Ophthalmology and Visual Science, 58, 2017	Published as conference abstract only; not enough information available
Willand, Michael P., Nguyen, May-Anh, Borschel, Gregory H., Gordon, Tessa, Electrical Stimulation to Promote Peripheral Nerve Regeneration, Neurorehabilitation and Neural Repair, 30, 490-6, 2016	Narrative review (references have been checked for relevant studies - none were identified)

Study	Reason for Exclusion
Yaghjyan, G. V., Azatyan, A. T., Factors influencing the functional outcome after repairing of median, ulnar, combined median - ulnar nerves: Review, New Armenian Medical Journal, 4, 4-14, 2010	Narrative review (references have been checked for relevant studies - none were identified)
Yu, A. P., Qiu, Y. Q., Li, J., Shen, Y. D., Wang, X. M., Cong, M., He, Q. R., Chen, Q. Z., Ding, F., Gu, Y. D., Xu, J. G., Jiang, S., Xu, W. D., Comparative effects of implanted electrodes with differing contact patterns on peripheral nerve regeneration and functional recovery, Neuroscience Research, 2018	Population not in PICO: None had nerve injury
Zhou, J. M., Gu, Y. D., Xu, X. J., Zhang, S. Y., Zhao, X., Clinical research of comprehensive rehabilitation in treating brachial plexus injury patients, Chinese Medical Journal, 125, 2516â□□2520, 2012	Outcomes not in PICO
Zink, P. J., Philip, B. A., Cortical Plasticity in Rehabilitation for Upper Extremity Peripheral Nerve Injury: A Scoping Review, The American journal of occupational therapy : official publication of the American Occupational Therapy Association, 74, 2020	Systematic review, included studies checked for relevance

Economic studies

All studies were excluded at the initial title and abstract screening stage. See appendix G for further information.

Excluded clinical and economic studies for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

Clinical studies

Table 13: Excluded studies and reasons for their exclusion

Study	Reason for Exclusion
Bialocerkowski, Andrea Emmi, Vladusic, Sharon, Moore, Rosemary Patricia, Lack of effectiveness of primary conservative management for infants with brachial plexus birth palsy, JBI library of systematic reviews, 7, 354-386, 2009	Systematic review (references have been checked for relevant studies - none were identified)
Eren, Abdullah, Guven, Melih, Erol, Bulent, Cakar, Murat, Delayed surgical treatment of supracondylar humerus fractures in children using a medial approach, Journal of children's orthopaedics, 2, 21-7, 2008	Not comparative study
Forogh, Bijan, Aslanpour, Hossein, Fallah, Ehsan, Babaei-Ghazani, Arash, Ebadi, Safoora, Adding high-frequency transcutaneous electrical nerve stimulation to the first phase of post anterior cruciate ligament reconstruction rehabilitation does not improve pain and function in young male athletes more than exercise alone: a randomized single-blind clinical trial, Disability and Rehabilitation, 1-9, 2017	Intervention not in PICO: transcutaneous electrical nerve stimulation. Further this study included a population of adults
Graessle, E., Infant crawling orthosis and home program to strengthen a neurologically impaired upper extremity, Journal of Hand Therapy, 31, 411-415, 2018	Not comparative study

Kirdi, N., Yakut, E., Meric, A., Peroneal nerve injuries as a complication of injection, The Turkish journal of pediatrics, 40, 405-11, 1998	Not comparative study
Nath, Rahul K., Somasundaram, Chandra, Significant improvement in nerve conduction, arm length, and upper extremity function after intraoperative electrical stimulation, neurolysis, and biceps tendon lengthening in obstetric brachial plexus patients, Journal of orthopaedic surgery and research, 10, 51, 2015	Not comparative study
Nct,, The Effect of Pre-operative Electrical Stimulation on Peripheral Nerve Regeneration, Https://clinicaltrials.gov/show/nct03205124, 2017	Study protocol
Saglam, Necdet, Saka, Gursel, Kurtulmus, Tuhan, Cem Coskun, Avci, Turker, Mehmet, Medial humeral condyle fractures in adolescents: treatment and complications, European journal of orthopaedic surgery & traumatology : orthopedie traumatologie, 24, 1101-5, 2014	Not comparative study
Tuohuti, T., Yu, Q., Yang, J., Wang, T., Gu, Y., Selective neurotization of the radial nerve in the axilla using intercostal nerve to treat complete brachial plexus palsy, International Journal of Clinical and Experimental Medicine, 9, 22880-22885, 2016	Not comparative study
Wan, L., Lin, X., Electrical stimulation effects on PNS injury and repair are mediated by accelerating intracellular trafficking?, Bioscience Hypotheses, 2, 65-68, 2009	Not comparative study

Economic studies

All studies were excluded at the initial title and abstract screening stage. See appendix G for further information.

Appendix L – Research recommendations

Research recommendations for review question: C.2a For adults with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No research recommendations were made for this review question.

Research recommendations for review question: C.2b For children and young people with complex rehabilitation needs after traumatic injury that involves nerve injury, what specific rehabilitation programmes and packages are effective and acceptable?

No research recommendations were made for this review question.