Repetitive strain injury

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Repetitive strain injury remains a controversial topic. The term repetitive strain injury includes specific disorders such as carpal tunnel syndrome, cubital tunnel syndrome, Guyon canal syndrome, lateral epicondylitis, and tendonitis of the wrist or hand. The diagnosis is usually made on the basis of history and clinical examination. Large high-quality studies using newer imaging techniques, such as MRI and ultrasonography are few. Consequently, the role of such imaging in diagnosis of upper limb disorders remains unclear. In many cases, no specific diagnosis can be established and complaints are labelled as non-specific. Little is known about the effectiveness of treatment options for upper limb disorders. Strong evidence for any intervention is scarce and the effect, if any, is mainly short-term pain relief. Exercise is beneficial for non-specific upper limb disorders. Immobilising hand braces and open carpal tunnel surgery release are beneficial for carpal tunnel syndrome, and topical and oral non-steroidal anti-inflammatory drugs, and corticosteroid injections are helpful for lateral epicondylitis. Exercise is probably beneficial for neck pain, as are corticosteroid injections and exercise for shoulder pain. Although upper limb disorders occur frequently in the working population, most trials have not exclusively included a working population or assessed effects on work-related outcomes. Further high-quality trials should aim to include sufficient sample sizes, working populations, and work-related outcomes.

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Repetitive strain injury is not one diagnosis, but is an umbrella term for disorders that develop as a result of repetitive movements, awkward postures, sustained force, and other risk factors.[1] Epidemiological studies have shown that psychosocial workplace factors such as low decision latitude (employees having little control over their working practices or conditions), psychological distress, monotonous work, and poor relationships within the workplace are also associated with symptoms of repetitive strain injury.[2] Although this disorder is common in people who work, and occupation-related factors are associated with an increased risk of its development, factors not related to work can also play a part, and it is common in the general population. The term repetitive strain injury is controversial and other descriptive terms for the symptoms have been suggested, such as cumulative trauma disorders, occupational cervicobrachial disorders, occupational overuse syndrome, upper extremity musculoskeletal disorders, upper limb disorders, and upper limb pain syndromes.[1,3,4]

Epidemiology

Repetitive strain injury arises frequently in adults of working age, with many people reporting strains of the hands, wrists, arms, shoulders, or neck. Repetitive strain injury complaints are common in the general population and are a frequent reason for visiting the general practitioner.[9] Several countries report a prevalence of 5–10% for non-specific complaints of strain that interferes with day-to-day activities,[10–13] but rates could be as high as 22–40% in specific working populations.[14–30] A large UK study (9696 people) reported frequencies of lateral epicondylitis (1·3% in men and 1·1% in women), de Quervain's disease (0·5% in men and 1·3% in women), and tenosynovitis of the hand or wrist (1·1% in men and 2·2% in women).[31] Other studies have reported prevalence rates of carpal tunnel syndrome of 7–14·5%.[16,25,32,33]

Repetitive strain injury is most common in specific professions and industrial settings. In Australia, for example, high rates of this disorder have been reported in men employed in industries manufacturing textiles, footwear, food, and beverages. High rates were also seen in women working in manufacturing of basic metal, food and beverages, textiles, clothing, and footwear.[8,34] In the Netherlands, the professions with highest risk of repetitive strain injury include tailors, dressmakers, construction workers, secretaries, typists, people who use visual display units, and those who load, unload, or pack goods.[6] The economic burden of repetitive strain injury is large, especially because of the high costs associated with absence from work. The mean costs of a worker's compensation claim for this disorder range from $5000 to $8000 and total $6·5 billion every year in the USA.[35] Several factors that increase the risk of repetitive strain injury have been identified, and can be categorised into physical, psychosocial, and individual risk factors.[36]

Ample evidence exists for the association between physical risk factors such as repetitive movements, poor posture, and inadequate strength and the occurrence of repetitive strain injury. The effects of work-related and psychosocial factors are not as clear as those of physical factors, although high workload, stress, and physical or

Search strategy and selection criteria

We searched Pubmed, Embase and the Cochrane Library from the dates that these databases begin up to December, 2005, for studies on pathophysiology, epidemiology, prognosis, diagnosis, and treatment of repetitive strain injury. Detailed search strategies for diagnostic and therapeutic studies are available from the corresponding author. Studies about pathophysiology, epidemiology and prognosis were identified by use of the MESH terms or free text words: "pathophysiology", "epidemiology", "incidence", "prevalence", "prognosis", and "prognostic factors". Clinical Evidence (issue 14, December, 2005) was screened for additional systematic reviews and subsequent trials.[5–8] No additional studies were identified in the Cochrane controlled trials register. We included studies of adults diagnosed with any type of specific or non-specific repetitive strain injury, work-related or not. We excluded studies on whiplash. No language restrictions were used in the search, but we were able to read and include only English, Dutch, Finnish, German, and French papers.

psychological demands, low job security, and little support from colleagues might be important.[2,14,36,37] The effect of individual factors is less clear, although a review[38] of 56 studies noted that repetitive strain injury is reported more frequently in women than in men. This finding was supported by three subsequent studies.[14,37,39,40] The relative importance of physical, psychosocial, and individual risk factors is unknown and strong conclusions from epidemiological studies are hampered by heterogeneous populations, exposures, and outcomes, and methodological flaws.

Pathophysiology

Several hypotheses for the pathophysiology of repetitive strain injury exist, but none has been strongly supported by scientific evidence. Despite initial distal presentation, this disorder seems to be a diffuse neuromuscular illness.[41] Mechanical (elastic deformation of connective tissue due to increased pressure within muscles) and physiological (electrochemical and metabolic imbalances) reactions might cause damage to muscle tissue and lead to complaints of strain. Continuous contraction of muscles from long-term static load with insufficient breaks could result in reduced local blood circulation and muscle fatigue. Consequently, pain sensors in the muscles could become hypersensitive, leading to a pain response at low levels of stimulation. Other hypotheses suggest frequent co-contractions in muscles or changes in proprioception as the source of injury.[6,42]

Some researchers have suggested that overuse of tendons by repetitive loading causes repetitive strain injury.[43] Four pathological mechanisms have been suggested for tendonitis: decreased elasticity of the tendon; friction between tendon and tendon sheath; tendon fatigue; and mechanically-induced local temperature increase.[6] Most patients with true inflammatory tendonopathies have long-lasting symptoms of degeneration of collagen fibre structure.[43]

The function of peripheral nerves can be disrupted by mechanical overload. In carpal tunnel syndrome, for example, studies showed that specific forearm, wrist, and finger postures, moderate hand loads, and external pressure on the palm can increase carpal tunnel pressure (at least temporarily) to levels at which nerve health is threatened.[44] Pressure in the surrounding tissue, reduced elasticity, vibrations, and direct compression of the nerves could reduce nerve conduction.

Diagnosis

No gold-standard tests for repetitive strain injury exist. In most cases, diagnosis is made on the basis of history and physical examination, including assessment of range of motion of joints, hypermobility, muscle tenderness, pain, strength, and imbalance between right and left limbs.[41] Some clinical tests are used for specific disorders. For example, Phalen's test, Tinel's test, and measurement of nerve conduction velocity are highly sensitive and specific for diagnosis of carpal tunnel syndrome, which supports their widespread use.[45,46] Electrodiagnostic tests such as nerve conduction studies or electromyographs might also be useful if clinical diagnosis is not clear, although their diagnostic accuracy has not yet been proven in high-quality studies with sufficient numbers of patients.[47,48]

The American College of Rheumatology has published criteria for imaging choices in chronic epicondylitis.[49] They advise that MRI can provide important diagnostic information for assessment of lateral epicondylitis, but that ultrasonography is of little diagnostic value. However, a systematic review concluded[50] that the assessment of MRI findings in epicondylitis was questionable because the diagnostic studies included were of low quality. Additionally, MRI is associated with high costs, and these images are unlikely to affect treatment decisions or outcomes.

A review[51] identified 27 classification systems for repetitive strain injury. These systems differed in the disorders they included, the names given to the disorders, and the criteria used to describe the disorders.[52] Palmer and colleagues[53] summarised three new approaches to classification of repetitive strain injury (table 1), which could be helpful for diagnosis.

All proposed classifications categorise repetitive strain injury into specific and non-specific disorders. Specific disorders can have symptoms mainly of pain, stiffness, tenderness, swelling, or paraesthesia in the neck, shoulder, elbow, hand and wrist, or carpal tunnel.[54] Non-specific repetitive strain is diagnosed by exclusion of specific diagnoses or pathologies. A structured examination has been developed for diagnosis and classification of repetitive strain injuries, on the basis of one of the classification systems in table 1.[4] This examination had reasonable reliability in both a hospital setting and a community setting.[53,55] At present, the usefulness of the other classification systems is not known.

Treatment

Non-specific work-related repetitive strain

Exercise therapy is a useful treatment for patients with non-specific work-related repetitive strain presenting to primary care physicians or physiotherapists. Exercise seems to provide symptom relief and improve activities of daily living.[56–63] Manual therapy, such as osteopathy or chiropractic could be useful in some patients.[56,64] If one kind of therapy does not reduce symptoms, multidisciplinary rehabilitation programmes are recommended, although no strong evidence is available for such treatments.[56,57,65,66] Other treatment options are available for non-specific work-related strain injuries, such as behavioural therapy,[56] massage, [58,62,63,67] multidisciplinary rehabilitation,[68] energised splint (gives off high-voltage pulses),[69] and ergonomic keyboards,[60,70,71] but whether or not these interventions are effective is still unclear. Ability to return to work and reduction of sick leave are important outcomes for the patient. However, in three studies of

	Harrington[4]	Sluiter[3]	Helliwell[52]
Neck	-	Radiating neck complaints: at least intermittent pain or stiffness in the neck and pain or paraesthesia in one or more upper extremity regions, associated with head movements for more than 4 of the past 7 days and pain in upper extremity on active or passive cervical rotation	-
Shoulder	Rotator cuff tendonitis: history of pain in the deltoid region and pain on resisted active movement (abduction—supraspinatus; external rotation—infraspinatus; internal rotation—subscapularis) Bicipital tendonitis: history of anterior shoulder pain and pain on resisted active flexion or supination of the forearm Capsulitis: history of pain in the deltoid area and equal restriction of active and passive glenohumeral movement with capsular pattern (external rotation>abd uction>internal rotation)	Rotator cuff syndrome: at least intermittent pain in the shoulder region without paraesthesia, which is worsened by active elevation of the upper arm for more than 4 of the past 7 days and at least one other positive test: (a) pain on resisted shoulder abduction, external rotation, or internal rotation; (b) resisted elbow flexion; or (c) painful arc	Tendonitis: limitation of abduction of the shoulder, painful arc on abduction of the shoulder, shoulder pain, sleep disturbance
Elbow	Lateral epicondylitis: epicondylar pain and epicondylar tenderness and pain on resisted extension of the wrist Medial epicondylitis: epicondylar pain and epicondylar tenderness and pain on resisted flexion of the wrist	Lateral or medial epicondylitis: at least intermittent, activity dependent pain localised around the lateral or medial epicondyle for more than 4 of the past 7 days and local pain on resisted wrist extension (lateral) or wrist flexion (medial) Cubital tunnel syndrome: at least intermittent paraesthesia in the 4th and 5th digit, or both, or the ulnar border of the forearm, wrist, or hand for more than 4 of the past 7 days and a positive combined pressure and flexion test Radial tunnel syndrome: pain in the lateral elbow region or forearm muscle mass of wrist extensors/supinator or weakness on extending the wrist and fingers for more than 4 of the past 7 days and tenderness in supinator region on palpation over the radial nerve 4–7 cm distal to the lateral epicondyle and at least one other positive test: (a) resisted forearm supination; or (b) resisted middle finger extension	Lateral epicondylitis: pain or tenderness or pain on loading relevant muscle at lateral epicondyle
Wrist and hand	De Quervain's disease: pain over the radial styloid and tender swelling of the extensor compartment and either pain reproduced by resisted thumb extension or positive Finkelstein test Tenosynovitis: pain on movement localised to the tendon sheaths of the wrist and reproduction of pain by resisted active movement	De Quervain's tenosynovitis: intermittent pain or tenderness localised over the radial side of the wrist, which may radiate proximally to the forearm or distally to the thumb for more than 4 of the past 7 days and at least one other positive test: (a) Finkelstein's test; (b) resisted thumb extension; or (c) resisted thumb abduction Peritendonitis or tenosynovitis: intermittent pain or ache in the ventral or dorsal forearm or wrist region for more than 4 of the past 7 days and provocation of symptoms during resisted movement of the muscles under the symptom area and reproduction of pain during palpation of the affected tendons or palpable crepitus under symptom area or visible swelling of dorsum wrist or forearm Guyon's canal syndrome: intermittent paraesthesia in the palmar ulnar nerve distribution of the hand, distal to the wrist or pain in the ulnar innervated area of the hand, which may radiate to the forearm for more than 4 of the past 7 days and at least one other positive test: (a) weakness or atrophy in the ulnar innervated intrinsic hand muscles; (b) Tinel's sign; (c) reversed Phalen test; or (d) pressure test over the Guyon's canal	Tenosynovitis: pain on movement of tendon or swelling of tendon sheath or triggering, locking, or nodule on tendon located in finger flexor or extensor tendon, or thumb flexor, extensor, or abductor tendon
Carpal tunnel	Carpal tunnel syndrome: pain or paraesthesia or sensory loss in the median nerve distribution and other positive test: (a) Tinel's test; (b) Phalen's test; (c) nocturnal exacerbation of symptoms; (d) motor loss with wasting of abductor pollicis brevis; or (e) abnormal nerve conduction time	Carpal tunnel syndrome: intermittent paraesthesia or pain in at least two of the first three digits, which might also be present at night (producing pain in the palm, wrist, or radiation proximal to the wrist) for more than 4 of the past 7 days and at least one other positive test: (a) flexion compression test (b) carpal compression test (c) Tinel's sign; (d) Phalen's sign; (e) 2 point discrimination test; or (f) resisted thumb abduction or motor loss with wasting of abductor pollicis brevis	Carpal tunnel syndrome: paraesthesia or numbness in median nerve distribution, pain at night, paraesthesia in a peripheral nerve distribution, or diminished power related to a peripheral nerve at the wrist
Non-specific disorders	Non-specific diffuse forearm pain: pain in the forearm in the absence of a specific diagnosis (sometimes includes: loss of function, weakness, cramp, muscle tenderness, allodynia, or slowing of fine movements)	Non-specific upper extremity musculoskeletal disorders: Diagnosis by exclusion	-

Table 1: **Suggested classifications for RSI[2]**

these outcomes, no significant differences were seen between treatments, so no specific treatment strategy can be recommended to improve duration of sick leave.[59,67,72]

Carpal tunnel syndrome

Most patients with carpal tunnel syndrome are treated with non-surgical interventions (table 2). A hand brace improves symptoms, and 2-week oral steroid treatment and local corticosteroid injections provide short-term pain relief (up to 12 weeks).[73,74] Many other non-surgical treatment options could provide pain relief. Carpal bone mobilisation, 7-weeks of ultrasound treatment, and yoga have shown some benefit, but small trials only were done.[73,75,76] Diuretic drugs, non-steroidal anti-inflammatory drugs (NSAIDs), vitamin B6, magnet therapy, laser acupuncture, use of ergonomic keyboards, exercise, and

	Intervention	Number of trials
Beneficial	Local corticosteroid injections (short-term)	2
	Oral corticosteroids (short-term)	3
	Wrist splint	3
Trade-off between benefits and harms	Endoscopic carpal tunnel release versus open carpal tunnel release	12
	Surgery or non-surgical intervention	4
Unknown effectiveness	Local corticosteroid injections (long-term)	0
	Non-steroidal anti-inflammatory drugs	1
	Oral corticosteroids (long-term)	0
	Pyridoxine	2
	Nerve and tendon gliding exercises	1
	Therapeutic ultrasound	2
	Yoga	1
	Carpal bone mobilisation	1
Unlikely to be beneficial	Diuretics	2
	Internal neurolysis in conjunction with open carpal tunnel release	6
Likely to be ineffective or harmful	Wrist splints after carpal tunnel release surgery	3

Table 2: **Common interventions for carpal tunnel syndrome.**[5]

	Intervention	Number of trials
Beneficial	Topical non-steroidal anti-inflammatory drugs (short-term)	3
Likely to be beneficial	Oral non-steroidal anti-inflammatory drugs (short-term)	2
	Corticosteroid injections	3
	Ultrasound	1
	Percutaneous tenotomy or formal open release	2
Unknown effectiveness	Exercise and mobilisation	1
	Non-steroidal anti-inflammatory drugs (long-term)	1
	Orthoses	5
Unlikely to be beneficial	Acupuncture	5
	Extracorporeal shock wave therapy	10

Table 3: **Common interventions for lateral epicondylitis**[6]

chiropractic care have not yet shown symptomatic benefit when in controlled trials.[73,75,76] No trials about carpal tunnel syndrome have included exclusively a working population or included sick leave as an outcome.

Endoscopic and open carpal tunnel release are surgical treatment options that can improve symptom relief in patients with severe electromyograph-confirmed carpal tunnel syndrome.[77–91] No alternative to standard open carpal tunnel release (a new modified incision; epineurotomy; internal neurolysis [epineurotomy then division of the nerve resulting in nerve decompression]; tenosynovectomy [excision or resection of a tendon sheath]; Knifelight instrument [a knife with integrated light source]) seems to offer better relief from symptoms in either the short-term or the long-term.[92] Neural surgery (neurolysis or epineurotomy) could even be harmful for patients with carpal tunnel syndrome.[93] Complications are frequent with surgery, but no severe complications resulting in permanent damage or serious impairments have been described.[91,92]

Surgical treatment relieves symptoms better than splinting.[94] However, two small trials only have compared surgery with splinting in patients with severe carpal tunnel symptoms. Whether this result applies to patients with mild symptoms is unknown. Two studies comparing surgery with steroid injections showed conflicting results.[95,96] None of these studies included exclusively a working population.

Cubital tunnel syndrome

Treatment of cubital tunnel syndrome is generally conservative for at least 6 months.[97] Such treatment aims for return to functional strength and mobility of the affected arm, and consists of manual therapy, splinting, stretching exercises, and pain management. Surgery might be necessary if conservative therapies fail, although optimum surgical management is controversial. Of the surgical interventions, medial epicondylectomy provides the best symptom relief for patients with mild symptoms, and anterior subcutaneous transposition provides the least relief.[98] Submuscular transposition is most effective for patients with moderate symptoms. For patients with severe cubital tunnel syndrome, the best treatment option is unknown.[98] None of these studies included exclusively a working population.

Lateral epicondylitis (tennis elbow)

Most patients with lateral epicondylitis are treated conservatively in primary care (table 3). Oral and topical NSAIDs provide short-term pain relief in patients with this disorder.[99] Only one trial evaluating these drugs included reduction of sick leave as an outcome and noted no benefit over placebo.[100] Corticosteroid injections are effective for short-term (6 weeks or less) pain relief, increase of grip strength, and overall improvement, but do not provide intermediate or long-term effects.[101] Ultrasound can also reduce symptoms.[102] Other treatment options for lateral epicondylitis are acupuncture (either needle or laser), orthotic devices, lasertherapy, electrotherapy, exercises, and mobilisation techniques, but the effectiveness of these therapies is unknown.[103,104] Shockwave therapy is not useful for lateral epicondylitis.[102,105] Surgery is also a treatment option in patients with severe symptoms. Percutaneous tenotomy for lateral epicondylitis seems somewhat better than open tenotomy for improvement of disability and decreasing recovery time and return-to-work.[106,107] None of the studies exclusively included a working population.

Neck pain

Patients with neck pain are usually treated in primary care with non-surgical interventions (table 4). Exercise therapy has some short-term benefit on pain and function for patients with neck pain.[108–115] Seven trials of exercise for neck pain have included exclusively a working population. No type of exercise (eg, strengthening, stretching, endurance, or eye-fixation exercises) can clearly be recommended over others. Differences in effect, if any, across types of exercise are small. Manipulation and

	Intervention	Number of trials
Beneficial	Exercise	4
Likely to be beneficial	Mobilisation plus exercise	1
Unknown effectiveness	Acupuncture	15
	Biofeedback	0
	Analgesics	0
	Non-steroidal anti-inflammatory drugs	0
	Antidepressants	0
	Muscle relaxants	3
	Heat or cold	0
	Multimodal treatment	2
	Patient education	2
	Pulsed electromagnetic field treatment	1
	Soft collars and special pillows	0
	Spray and stretch	1
	Traction	2
	Transcutaneous electrical nerve stimulation	0
Unlikely to be beneficial	Manipulation	4
	Mobilisation	2

Table 4: **Common interventions for neck pain.**[7]

	Intervention	Number of trials
Likely to be beneficial	Subacromial corticosteroid injections	5
	Intra-articular corticosteroid injections	4
	Physiotherapy (manual treatment, exercise)	3
	Surgical arthroscopic decompression	2
Unknown effectiveness	Acupuncture	1
	Arthroscopic laser subacromial decompression	0
	Electrical stimulation	3
	Extracorporeal shock wave therapy	5
	Laser treatment	4
	Manipulation under anaesthesia plus intra-articular injection in people with frozen shoulder	2
	Ice	1
	Intra-articular guanethidine	0
	Intra-articular non-steroidal anti-inflammatory drugs	0
	Multidisciplinary biopsychosocial rehabilitation	1
	Opioid analgesics	0
	Oral corticosteroids	3
	Oral non-steroidal anti-inflammatory drugs	5
	Paracetamol	0
	Phonophoresis	0
	Pulsed electromagnetic field therapy	1
	Topical non-steroidal anti-inflammatory drugs	0
	Transdermal nitroglycerine	1
	Ultrasound	5

Table 5: **Common interventions for shoulder pain**[8]

mobilisation are not useful on their own for mechanical neck disorders with or without headache.[116] However, mobilisations or manipulations combined with exercises might be useful for pain reduction, improvement in function, and reduction of amount of sick leave.

Intra-muscular injection of lidocaine could be an effective treatment for some patients with chronic neck pain.[117,118] Epidural injection of methylprednisolone with lidocaine might be helpful for reduction of sick leave after 6 and 12 months for patients with chronic neck pain with radicular findings. For patients with cervicobrachial pain, radiofrequency denervation might provide short-term pain relief.[119] Other commonly used treatment options for neck pain are a collar, NSAIDs, psychotropic medication, electrotherapy, and transcutaneous electrical nerve stimulation. Whether these interventions are effective or not is still unclear.[117,120]

Shoulder pain

Corticosteroid injections are commonly used for treatment of shoulder pain (table 5).[121] Little evidence is available to guide treatment as to the number, site, and dose of injections. Subacromial corticosteroid injection for rotator cuff disease and intra-articular injection for adhesive capsulitis could be beneficial although their effect might be small and not well-maintained.[121] Steroid injection might somewhat speed up return-to-work, as seen at 12 months follow-up in one study.[122] Physiotherapeutic interventions are also widely used for treatment of shoulder pain. Exercises, either alone or combined with mobilisation, provide short-term recovery and long-term improvement in function.[123] Ultrasound and pulsed electromagnetic field therapy are possible treatments for shoulder pain, adhesive capsulitis, or rotator cuff tendonitis but their benefits are unproven.

If one intervention has not been beneficial, multidisciplinary programmes are a sensible treatment option for workers with shoulder pain.[124] The content of these programmes can vary, and also the disciplines involved: physicians, physical and occupational therapists, and psychologists might all have a role. Whether psychologists should provide behavioural treatment or merely advise the rehabilitation team has not been well established.[125] Also, if regular interventions have not been beneficial, some patients with shoulder pain might want to try alternative health remedies. The effectiveness of alternative treatments, such as acupuncture, has not been proven.[126]

Patients with resistant or longstanding shoulder pain are often referred for specialist treatment, such as surgery. Arthroscopic decompression is probably beneficial for rotator cuff,[8] although a randomised trial did not find a difference compared with conservative treatment.[127] None of these studies exclusively included a working population.

Conclusion

No consensus exists on use of the term repetitive strain injury (or any other term), and little is known about the pathophysiology of this disorder. Evidence about risk factors

is increasing but the relative effects of such risk factors are not well understood, and commonly used diagnostic tests for specific strain injuries have no empirical support. Yet, repetitive strain injuries occur frequently, especially in workers, and many people with specific or non-specific symptoms will seek advice from a clinician.

Many treatment options exist and are commonly used in daily practice for patients with specific and non-specific strain injuries, such as rest, medication, exercise therapy, physical therapy, behavioural therapy, occupational therapy, ergonomic intervention, or combinations of treatments. Some interventions for repetitive strain might be effective for pain relief, but positive findings on function and return-to-work or reduction of amount of sick leave taken are scarce and effect sizes, if any, are only small. Some studies assessed the natural course of repetitive strain injuries and showed that some patients improve without treatment.[128,129] However, none of these studies had sufficiently long follow-up. Effect sizes of treatment might be increased if subgroups of patients who would improve without treatment could be identified, and treatment could be reserved for subgroups of patients with poor prognosis.

No useful evidence-based recommendations can be provided for the treatment of De Quervain's tenosynovitis, Guyon canal syndrome, peritendonitis, or tenosynovitis of the wrist and radial tunnel syndrome, because data from randomised trials assessing the effectiveness of interventions for these disorders are not available.

Randomised trials that exclusively included people with occupational repetitive strain injury are scarce and not all completed trials included work-related outcomes. Not much is known about the effectiveness of interventions for specific and non-specific repetitive strain injuries in a working population, and especially little is known about effects on work-related outcomes.

Strong recommendations for any therapeutic intervention cannot be made at present because many trials have small sample sizes and methodological flaws that could have led to biased results. High-quality trials for therapeutic interventions for specific and non-specific repetitive strain injury need sufficient sample sizes and adequate follow-up. Future trials should also include an assesment of cost-effectiveness. This disorder will remain controversial until high-quality trials provide clear definition of repetitive strain injury and evidence of effective treatments.

Conflict of interest statement

We declare that we have no conflict of interest

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