Manual passive stretching for adults unable to move their own joints

Key points

- Manual passive stretching is commonly advised for adults at risk of contracture.
- There is insufficient direct evidence to be confident that manual passive stretching is clinically effective for prevention or treatment of contracture in adults at risk due to neurological conditions or unconsciousness.
- Further research is needed to establish clearly defined approaches to managing contracture in this population using outcome measures that are clinically relevant.
- Providing manual passive stretching in a rehabilitation context has cost implications, however, there is a lack of evidence regarding cost effectiveness.

Health technology description

Manual passive stretching is a physical treatment administered by a therapist to joints that the patient is not able to move independently. The therapist manually moves the affected joint to the limit of its range of movement and holds this stretch position briefly before repeating the procedure. In the context of rehabilitation this treatment is given to maintain joint range of movement and counteract the development of contracture, and to reduce muscle spasticity which may contribute to the development of contracture. The ultimate goal is to optimise patient function. The time spent stretching a joint and the frequency of treatment sessions varies from a few minutes a day to weekly or less often. Adults with chronic neurological conditions that cause progression or recurrence of contractures may receive passive stretching from a therapist in the acute care setting and on home visits over long periods of time.

Epidemiology

Joints need regular movement to maintain their mobility. When a joint cannot be moved regularly through its full range of motion physiological changes occur in the surrounding muscles and other tissues causing them to shorten, which restricts mobility about the joint. This is a common complication affecting patients who are unable to maintain a full range of joint movement because they are unconscious or have a neurological condition associated with immobilisation, muscle weakness, flaccid or increased (spastic) muscle tone. This includes patients with multiple sclerosis, spinal cord injury and acquired brain injury including stroke. Reduced joint mobility can lead to contracture and deformity in any of these conditions.

In multiple sclerosis contractures are seen commonly in daily clinical practice although the prevalence is not known. Scotland has a multiple sclerosis prevalence of 150 to 200 cases per 100,000 population. Reports suggest that some degree of contracture may occur in over 80% of patients with traumatic brain injury and in over 50% after stroke, and that it is a common complication of spinal cord injury. UK estimates indicate a prevalence of 50 per 100,000 for spinal cord injury. UK estimates indicate a prevalence of 50 per 100,000 for spinal cord injury and from 228 to 1,200 per 100,000 for traumatic brain injury leading to long term problems. The prevalence of stroke in the UK is estimated at 500 per 100,000. NHSScotland recorded 16,012 hospital discharges for stroke during the year ending March 2005.
Clinical effectiveness

The effect of manual passive stretching in adults at risk of contracture has not been tested adequately in randomised trials. The outcome measures used in the trials that were found were physical signs rather than direct measures of patient function. Only one randomised trial was identified in which passive range of motion stretching was applied manually. That trial in stroke patients with spastic finger flexor muscles found a statistically significant improvement in control of finger-extension movement immediately after stretching the finger and wrist joints. The study included only eight patients and did not assess how long the observed effect lasted.

Two well-conducted randomised trials assessed whether 30 minutes of constant stretching applied with mechanical devices had lasting effects in adults with spinal cord injury. In these trials daily stretching over four weeks had no significant effect on measures of ankle mobility or hamstring muscle extensibility.

Another randomised but less robust pilot study in stroke patients found that daily stretching for 30 minutes with a hinge-board device had no significant effect on wrist extension or wrist extension contracture after 12 weeks. Brief repeated range of motion stretching comparable to what a therapist would do manually has not been assessed in randomised trials in a relevant population. There is weak evidence, from an uncontrolled study of seven brain injured adults, of a short-term reduction in spastic hypertonia in response to passive elbow joint flexion-extension movements repeated mechanically 20 to 30 times at one minute intervals.

No study has yet looked at the effectiveness of passive stretching over a period longer than 3 months. No published reports were found of the effects of passive stretching on patient function, disability or quality of life. Even though patients are believed to experience a psychological benefit from physical therapy the evidence is anecdotal.

The NICE multiple sclerosis guideline gives recommendations regarding physical techniques such as passive stretching to reduce spasticity and avoid the development of contracture based only on clinical experience, expert opinion or indirect evidence.

Potential risks

It has been suggested that micro trauma induced by stretching a joint beyond the pain-free range of movement may cause bone deposits to form in the surrounding soft tissues (myositis ossificans), and thereby further limit the range of joint movement. In one randomised trial passive stretching of the hamstring muscle provoked an increase in blood pressure (autonomic dysreflexia) in one patient with spinal cord injury. Psychological dependency on physiotherapy is a potential problem that requires further research.

Economic implications

No published economic evidence was identified. The health economic concerns around management of contractures in the UK increasingly impinge on those providing rehabilitation care. Provision of regular passive stretching by skilled therapists in the absence of evidence of clinical effectiveness has substantial resource implications.

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continued overleaf
References


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