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Managing Contractures in Long-Term Care

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One of the more challenging treatment areas in the geriatric population in long-term care is managing contractures. A contracture can be defined as a loss of joint motion due to structural changes in non-bony tissue (i.e., muscles, ligaments, tendons). Contractures can lead to more pain, skin breakdown, decreased hygiene and decreased mobility and ADLs. This article will review contractures in long-term care and methods of evaluation and treatment.

Muscle Structure

The muscle is comprised of two myogenic structures, contractile tissue and connective tissue. Contractile tissue includes muscle fibers that contain myofibrils (a series of sarcomeres). Sarcomeres are multi-protein complexes comprised of myosin (thick filaments) and actin (thin filaments).

Connective tissue in muscle includes sheaths that cover the entire muscle (epimysium), groups of muscle fibers or fascicles (perimysium) and individual muscle fibers (endomysium). Connective tissue also is comprised of collagen and elastin fibers. Contractile tissue loses sarcomeres when in a shortened position and gains sarcomeres when in a lengthened position. Further, in a shortened position, connective tissue shortens and loses elasticity.

Joint or arthrogenic structures (i.e., joint capsule, ligaments) may also be involved in contractures. Myogenic structures are most responsible for joint limitation or contracture in the first two weeks of immobilization, while arthrogenic structures are increasingly implicated after the initial two-week immobilization phase.1

Contracture Causation

The etiology of contractures is many and varied. Diseases such as rheumatoid arthritis, osteoarthritis and reflex sympathetic dystrophy may lead to contracture and discomfort or pain with stretch. Acute shortening may occur after injury and lead to lost range of motion. Chronic or adaptive shortening may occur due to prolonged immobility. Finally, loss of range of motion and contracture may result from neurological conditions (i.e., CVA, TBI) that lead to abnormal tone and spasticity.

Assessment of Contracture

When assessing chronic contractures, it's important to examine and document end feel, which is accomplished by performing a passive stretch to a patient's comfortable end range. A springy or bouncy end feel at end range indicates good elasticity, while a hard end feel represents poor elasticity. Fixed contractures generally cannot be ranged and manifest as a rock-hard end feel. Non-fixed contractures generally allow for at least 10 degrees of passive range of motion. End feel can be documented as follows:

Fixed contracture = Rock-hard end feel, no play;

Poor = 1-3 degrees of play at end feel;

Fair = 4-6 degrees of play at end feel;

Good = 7-10 degrees of play at end feel;

Excellent = Springy and bouncy end feel; 11+ degrees of play.

When assessing loss of range of motion due to neurological conditions or complications, a tonal examination should be performed using the Modified Ashworth Scale (MAS).2 The MAS can be documented as follows:

0 = No abnormal muscle tone;

1 = Slight increase in tone with a catch and release or minimal resistance at end of range;

1+ = Slight increase in tone but with minimal resistance through range following catch;

2 = More marked increase in tone through range of motion;

3 = Considerable increase in tone, passive movement difficult;

4 = Affected part rigid.

Intervention for Contracture

Short-term effects may be achieved through deep heating with modalities such as ultrasound, electrical stimulation, a nerve block, joint mobilization and passive stretching. Low-load, prolonged stretches (approximately 30 to 60 seconds per stretch) are most effective for permanent elongation compared to short duration (<30 seconds), intense stretches. Mild pain is acceptable if the pain is experienced in the muscle stretched and the patient can still relax.

Long-term effects can be further achieved through the use of continuous passive motion (CPM) machines, serial casting and the use of splinting or orthotics.

Static splints primarily provide protection and support of a particular joint or proper positioning of the joint. Air bladders can be used to provide gentle low-load prolonged stretches when there is fair to good end feel, particularly for limitations in hand range of motion. Dynamic splints may be used for spring-loaded, low-load prolonged stretch for joints like the elbow and knee.

References

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