



**SANDHILLS
CENTER**



Neuromuscular re-education

Clinical Policy ID: CCP.1262

Recent review date: 9/2021

Next review date: 1/2023

Policy contains: Alexander technique, motor imagery, multidisciplinary rehabilitation, neuromuscular re-education.

This policy is a Sandhills Center Clinical Coverage Policy adopted from AmeriHealth Caritas of North Carolina. These clinical policies are used to assist with making coverage determinations. Sandhills Center's clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of "medically necessary," and the specific facts of the particular situation are considered by Sandhills Center when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Sandhills Center clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Sandhills Center's clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Sandhills Center will update its clinical policies as necessary. Sandhills Center clinical policies are not guarantees of payment.

Coverage policy

Neuromuscular re-education of movement, balance, coordination, kinesthetic sense, posture, and/or proprioception for sitting and/or standing activities is clinically proven and, therefore, medically necessary for documented impairments which affect the body's neuromuscular system, including, but not limited to:

- Documented therapeutic procedures including proprioceptive neuromuscular facilitation, Feldenkrais, Bobath, Biomechanical Ankle Platform System boards, and desensitization techniques.
- Documented therapeutic procedures which affect the body's neuromuscular system, including conditions such as:
 - Loss of deep tendon reflexes and vibration sense accompanied by paresthesia, burning, or diffuse pain of the feet, lower legs, and/or fingers.
 - Nerve palsy, such as peroneal nerve injury causing foot drop.
 - Muscular weakness or flaccidity resulting from a cerebral dysfunction, a nerve injury or disease, or having had a spinal cord disease or trauma.
 - Poor static or dynamic sitting/standing balance.
 - Loss of gross and fine motor coordination.
 - Hypo- or hyper-tonicity.

Documentation justifying neuromuscular re-education must show impairments which affect the neuromuscular system as listed above, and must contain objective measurements/ratings of loss of motion, strength, balance, coordination, and/or mobility (e.g., degrees of motion, strength grades, assist for balance and mobility, or specific tests for balance and coordination).

Neuromuscular re-education is considered medically necessary for no longer than six to eight weeks, unless documentation exists supporting continued treatment beyond this frequency and duration (Centers for Medicare & Medicaid Services 2019, 2021).

Limitations

No limitations were identified during the writing of this policy.

Alternative covered services

Physical therapy.

Background

Neuromuscular diseases represent a heterogeneous group of disorders, including motor neuron diseases, disorders of motor nerve roots or peripheral nerves, neuromuscular transmission disorders, and muscle diseases. There are approximately 600 different neuromuscular diseases with greatly varying needs.

Neuromuscular re-education represents a series of therapeutic techniques to restore normal function of nerves and muscles, including movement, balance, coordination, decreased kinesthetic sense, and impaired proprioception. A broad array of treatments, including repetitive movement, posturing, and stimulation, are included in re-education programs. Neuromuscular re-education was first defined in a December 11, 1954, article in the *Journal of the American Medical Association* (American Medical Association, 2017).

The code for neuromuscular re-education used under the Current Procedural Terminology system, developed by the American Medical Association, is 97112. This code requires one-on-one patient contact by a physician or qualified therapist, for 15-minute intervals (American Chiropractic Association, 2015), for no longer than six to eight weeks, unless further care is needed (Centers for Medicare & Medicaid Services, L33942, L34049, 2019, 2021).

Neuromuscular re-education is one technique used by rehabilitation therapists to facilitate the return of normal movement in individuals with neuromuscular impairments. Muscle movement patterns are affected when nerves or muscles experience damage or injury as a result of trauma, medical conditions, or neurological conditions, such as a stroke or traumatic brain injury.

Neuromuscular re-education is a stand-alone, hands-on approach to the evaluation and functional treatment of 90% or more of the soft tissue injuries a provider will see in practice. It is similar to balance training and can also be used to improve balance, strength, coordination, posture, and kinesthetic sense and restore normal soft tissue tone and elasticity. Neuromuscular re-education techniques help patients regain normal, controlled movement patterns and awareness of the position of extremities.

Neuromuscular re-education plays a major role in the outpatient orthopedic physical therapy setting. If the proper techniques, activities and exercises are not performed on an injured body part, an acute injury can develop into

a chronic situation. In these approaches, tasks are broken down into their most simple component single-joint

movement patterns. These patterns are perfected with proper alignment, breathing, and muscle stabilization in non-weight-bearing postures using manual or mechanical assistance.

Biofeedback is a relatively common practice used to re-train patients to acquire voluntary control of a normally involuntary bodily function. Biofeedback is classified as an adjunct for neuromuscular re-education (Vanswearing, 2008).

Findings

No professional guideline exists specifically addressing neuromuscular re-education, but the topic is included in guidelines for any of a broad range of disorders. For example, the American Heart Association/American Stroke Association guideline on stroke rehabilitation and recovery states that the effectiveness of neuromuscular facilitation has not been established. This guideline is also endorsed by the American Academy of Neurology (American Academy of Neurology, 2016; Winstein, 2016).

In a meta-analysis involving patients following total hip arthroplasty, patients demonstrated compensatory movement strategies during activities of daily living such as walking and stair climbing. Participants in the neuromuscular re-education program improved their internal hip abductor moments and vertical ground reaction forces during walking and stair climbing, while improving their functional performance and hip abductor strength outcomes. The results of this study suggest that neuromuscular re-education creates a unique effect on movement strategy and function for patients following total hip arthroplasty (Judd, 2015).

A systematic review of nine studies of the effectiveness of neuromuscular re-education of musicians with focal hand dystonia included constraint-induced therapy plus motor control retraining, sensory motor retuning, learning-based sensorimotor training, and slow-down exercise. The review yielded moderate evidence to support effectiveness on reducing abnormal movements during instrument play in these musicians (Enke, 2018).

In a Cochrane study of 96 randomized controlled trials (n = 10,401) involving stroke patients, the aim was to determine whether physical rehabilitation approaches, including neuromuscular re-education, are effective in recovery of function and mobility. The review determined that physical rehabilitation is beneficial, when compared with no treatment, on functional recovery after stroke. Physical rehabilitation proved to be more effective than usual care or attention control in improving motor function. However, no one physical rehabilitation approach was more or less effective than any other approach in improving independence in activities of daily living (Pollock, 2014).

A systematic review of 22 studies, including seven randomized trials, assessed the ability of child cancer survivors to improve physical function after rehabilitation. Over half of the studies were on programs to increase strength and physical activity, with few assessing neuromuscular re-education. Some evidence supported improvements in strength, but mixed evidence for improving physical activity (Wacker, 2017).

In a systematic review of 30 articles and rehabilitation programs that addressed patients after anterior cruciate ligament surgery, authors concluded that the principal components of effective treatment included instruction and re-education. Reduction of pain, swelling, and inflammation and regaining range of motion, strength, and neuromuscular control are the most important aims in any such program (van Grinsven, 2010).

A review of the literature concludes that neuromuscular re-education is a common and effective component of rehabilitation of knee injuries suffered by runners, as manual therapy in conjunction with strengthening and motor retraining programs, even in the acute phase of treatment (Mellinger, 2019).

A review of six studies (n = 269) of Bell's palsy patients included neuromuscular re-education in each. All studies concluded the benefits of exercise therapy, while four of six considered electromyogram biofeedback to be effective through neuromuscular re-education (Pourmomeny, 2014).

A systematic review of 20 randomized controlled trials evaluated effectiveness of training interventions in enhancing neuromuscular control and functional performance. Balance training proved effective in improving postural sway and functional balance versus controls. Programs of longer duration resulted in larger effect sizes (Zech, 2010).

In several randomized controlled trials including patients with acquired brain injury, researchers assessed the effects of multidisciplinary rehabilitation as compared to the effects of routinely available local services or lower levels of intervention in adults ages 16 to 65 (Turner-Stokes, 2015). According to the trials, the context of multidisciplinary rehabilitation appears to influence outcomes. For instance, strong evidence supports the use of a milieu-oriented model for patients with severe brain injury.

The Alexander technique is a type of neuromuscular re-education that develops potential to avoid unnecessary muscular tension by retraining physical movement reactions. A systematic review of 18 articles concluded that strong evidence exists for the technique's effectiveness for chronic back pain; moderate evidence exists for Parkinson's-associated disability; and preliminary evidence suggests improvements in balance skills in the elderly and in general chronic pain, posture, respiratory function, and stuttering (Woodman, 2012).

A systematic review of 12 studies of musicians suffering from various neurological disorders found that the Alexander technique was effective in reducing performance anxiety, but results for music performance and respiratory function were inconclusive (Klein, 2014).

References

On June 15, 2021, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were "motor imagery," "multi-disciplinary rehabilitation," "neuromuscular re-education," "physical therapy," and "physical rehabilitation." We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

9/2016: initial review date and clinical policy effective date: 1/2017

9/2017: Policy references updated.

9/2018: Policy references updated.

9/2019: Policy references updated. Policy ID changed to CCP.1262.

9/2020: Policy references updated.

9/2021: Policy references updated.