Clinical Policy Bulletin: Physical Therapy Services

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Policy

Aetna considers physical therapy medically necessary when this care is prescribed by a physician (i.e., chiropractor, DO, MD, nurse practitioner, podiatrist or other health professional qualified to prescribe physical therapy according to State law) in order to significantly improve, develop or restore physical functions lost or impaired as a result of a disease, injury or surgical procedure.

Once therapeutic benefit has been achieved, or a home exercise program could be used for further gains, continuing supervised physical therapy is not considered medically necessary.

Physical therapy in asymptomatic persons or in persons without an identifiable clinical condition is considered not medically necessary.

Physical Therapy is medically necessary if it will assist the recipient to achieve or maintain maximum functional capacity in performing daily activities.

Notes: Aetna HMO, QPOS, Health Network Only, and Health Network Option plans generally cover only short-term physical therapy when the member is likely to gain significant improvement from therapy applied over this period of time. Because of this short-term restriction, these plans do not cover ongoing physical therapy in the management of individuals with chronic diseases, except as indicated in our coverage rules. In most cases, this short-term limitation does not apply to Indemnity and PPO plans. Standard Managed Choice plans cover up to 60 physical therapy visits or sessions per calendar year. Please check benefit plan descriptions for details.

Physical therapy may require precertification in some plan designs. Subject to plan benefit descriptions, physical therapy may be a limited benefit.

In Aetna Better Health PA MA’s only limit is 15 visits per 30 days.

Typically, in Aetna HMO plans, the physical therapy benefit is limited to a 60-day treatment period. When this is the case, the treatment period of 60 days applies to a specific condition. In some plan designs this limitation is applied on a calendar year or on a contract-year basis. In others it is a lifetime limitation. Please check...
benefit plan descriptions for details. Regardless, it is possible for a member to receive more than one 60-day treatment course of physical therapy as treatment of separate conditions. For example, a surgical procedure causing the need for physical therapy is considered to be the initiation of a new or separate condition in a person who previously received physical therapy for another indication, and so qualifies the member to receive coverage for an additional course of physical therapy as outlined above. An exacerbation or flare-up of a chronic illness is not considered a new incident of illness.

In some plans, the available physical therapy benefit is defined by a number of treatment sessions covered per year regardless of the condition or number of courses of therapy indicated.

Standard Aetna policies exclude coverage for services, treatment, education testing, or training related to learning disabilities or developmental delays. Under plans with this exclusion, physical therapy is not covered when the primary or the only diagnosis for a member is mental retardation or a learning disability such as a perceptual handicap, brain damage not caused by accidental injury, minimal brain dysfunction, dyslexia, or developmental delay. Please check benefit plan descriptions for details.

**Home-Based Physical Therapy:**

Aetna considers home-based physical therapy medically necessary in selected cases based upon the member's needs. This may be considered medically necessary in the transition of the member from hospital to home, and may be an extension of case management services.

**Note:** In Aetna HMO, QPOS, Health Network Only, and Health Network Option plans, such short-term physical therapy accumulates towards the 60-day limit or other applicable rehabilitation benefit limits. Please check benefit plan descriptions for details.

**The Interactive Metronome Program:**

Aetna considers the Interactive Metronome program experimental and investigational because there is insufficient evidence to support its effectiveness.

**Augmented Soft Tissue Mobilization:**

Aetna considers augmented soft tissue mobilization experimental and investigational because it has not been proven to be more effective than standard soft tissue mobilization. There is no reliable evidence that outcomes of soft tissue mobilization (myofascial release) are improved with the use of hand-held tools (so-called "augmented soft tissue mobilization").

**Kinesio Taping/Taping:**

Aetna considers Kinesio taping/taping for back pain, radicular pain syndromes, and other back-related conditions experimental and investigational because its clinical value has not been established.

Aetna considers Kinesio taping experimental and investigational for lower extremity spasticity, meralgia paresthetica, post-operative subacromial...
decompression, wrist injury, and prevention of ankle sprains because its effectiveness for these indications has not been established.

**MEDEK Therapy:**

Aetna considers MEDEK therapy experimental and investigational because its clinical value has not been established.

**Hands-Free Ultrasound and Low-Frequency Sound (Infrasound):**

Aetna considers "hands-free" ultrasound and low-frequency sound (infrasound) experimental and investigational because their clinical values have not been established.

**Hivamat Therapy (Deep Oscillation Therapy):**

Aetna considers Hivamat therapy (deep oscillation therapy) experimental and investigational because its clinical value has not been established.

**Applied Functional Science:**

Aetna considers Applied Functional Science experimental and investigational because its clinical value has not been established.

**Background**

Physical therapy treatment consists of a prescribed program to relieve symptoms, improve function and prevent further disability for individuals disabled by chronic or acute disease or injury. Treatment may include various forms of heat and cold, electrical stimulation, therapeutic exercises, ambulation training and training in functional activities.

Medically necessary physical therapy services must be restorative or for the purpose of designing and teaching a maintenance program for the patient to carry out at home. The services must also relate to a written treatment plan and be of a level of complexity that requires the judgment, knowledge and skills of a physical therapist (or a medical doctor/doctor of osteopathy) to perform and/or supervise the services. The amount, frequency and duration of the physical therapy services must be reasonable, the services must be considered appropriate and needed for the treatment of the disabling condition and must not be palliative in nature.

Below is a description and medical necessity criteria for different treatment modalities and therapeutic procedures.

1. **Activities of Daily Living (ADL) Training** -- Training of severely impaired individuals in essential ADL, including bathing; feeding; preparing meals; toileting; walking; making bed; and transferring from bed to chair, wheelchair or walker. This procedure is considered medically necessary to enable the member to perform essential ADL related to the patient's health and hygiene, within or outside the home, with minimal or no assistance from others. This procedure is considered medically necessary only when it requires the professional skills of a provider, is designed to address
specific needs of the member, and must be part of an active treatment plan
directed at a specific outcome. The member must have the capacity to
learn from instructions. Standard medical treatment may generally require
up to 12 visits in 4 weeks. Services provided concurrently by physicians,
physical therapists and occupational therapists may be considered
medically necessary if there are separate and distinct functional goals.

2. Aquatic Therapy/Hydrotherapy/Hubbard Tank -- Hubbard tank involves a
full-body immersion tank for treating severely burned, debilitated and/or
neurologically impaired individuals. Pool therapy (aquatic therapy,
hydrotherapy) is provided individually, in a pool, to severely debilitated or
neurologically impaired individuals. (The term is not intended to refer to
relatively normal individuals who exercise, swim laps or relax in a hot tub or
Jacuzzi). Develops and/or maintains muscle strength including range of
motion by eliminating forces of gravity through total body immersion (except
for head) -- requires constant attention. It is not considered medically
necessary to provide more than 1 type of hydrotherapy on the same day
(e.g., whirlpool, Hubbard tank, hydrotherapy). For medical necessity
criteria, see CPB 0174 - Pool Therapy, Aquatic Therapy or Hydrotherapy.

3. Cognitive skills development -- This procedure is considered medically
necessary for persons with acquired cognitive defects resulting from head
trauma, or acute neurologic events including cerebrovascular accidents. It
is not appropriate for persons with chronic progressive brain conditions with
no potential for restoration. Occupational/speech therapists or clinical
psychologists with specific training in these skills are typically the
providers. This procedure should be aimed at improving or restoring
specific functions which were impaired by an identified illness or injury. The
goals of therapy, expected outcomes and expected duration of therapy
should be specified.

4. Contrast Baths -- Blood vessel stimulation with alternate hot and cold baths
-- constant attendance is needed. This modality may be considered
medically necessary to treat extremities affected by reflex sympathetic
dystrophy, acute edema resulting from trauma, or synovitis/tenosynovitis. It
is generally used as an adjunct to a therapeutic procedure. Standard
treatment is 3 to 4 treatments per week for 1 month.

5. Crutch/Cane Ambulation -- Ambulation training ad re-education with the use
of assistive devices such as cane or crutches. Considered medically
necessary for persons who meet medical necessity criteria for ambulatory
assist devices. See CPB 0505 - Ambulatory Assist Devices: Walkers, Canes
and Crutches.

6. Diathermy (e.g., microwave) -- Deep, dry heat with high frequency current
or microwave to relieve pain and increase movement -- supervised. The
objective of diathermy is to cause vasodilatation and relieve pain from
muscle spasm. Diathermy using deep dry heat with high-
frequency achieves a greater rise in deep tissue temperature than does
microwave. Considered medically necessary as a heat modality for painful
musculoskeletal conditions. Considered experimental and investigational
as a treatment for asthma, bronchitis or other pulmonary conditions.
7. Electrical Stimulation -- For medical necessity criteria, see CPB 0011 - Electrical Stimulation for Pain; CPB 0677 - Functional Electrical Stimulation and Neuromuscular Electrical Stimulation; and CPB 0680 - Electrical Stimulation for Chronic Ulcers.

8. Gait Training -- Teaching individuals with severe neurological or musculoskeletal disorders to ambulate in the face of their handicap or to ambulate with an assistive device. Gait training is considered medically necessary for training individuals whose walking abilities have been impaired by neurological, muscular or skeletal abnormalities or trauma. Gait training is not considered medically necessary when the individual's walking ability is not expected to improve. Provider supervision of repetitive walk-strengthening exercise for feeble or unstable patients is not considered medically necessary. Gait training is not considered medically necessary for relatively normal individuals with minor or transient abnormalities of gait who do not require an assistive device; these minor or transient gait abnormalities may be remedied by simple instructions to the individual.

9. Hot/Cold Packs -- Hot packs increases blood flow, relieves pain and increases movement; cold packs decreases blood flow to an area to reduce pain and swelling immediately after an injury. These are used in Contrast Therapy under supervision. Considered medically necessary as thermal modalities (hot or cold) for painful musculoskeletal conditions and for acute injuries. See also CPB 0297 - Cryoanalgesia and Therapeutic Cold.

10. Infrared Light Therapy -- Dry heat with a special lamp to increase circulation to an area under supervision. The objective is to cause vasodilatation and relieve pain from muscle spasm. Considered medically necessary as a heat modality for musculoskeletal indications. See also CPB 0540 - Heating Devices; and CPB 0604 - Infrared Therapy.

11. Iontophoresis -- Electric current used to transfer certain chemicals (medications) into body tissues. For medical necessity criteria, see CPB 0229 - Iontophoresis.

12. Kinetic Therapy -- Use of dynamic activities to improve functional performance. Considered medically necessary when there are major impairments or disabilities which preclude the individual performing the activities and exercises that are ordinarily prescribed. In kinetic therapy, considerable time is spent developing specific, individualized therapeutic exercises and instructing the patient in how to perform them. The term kinetic therapy is not intended to apply to instructions in routine exercises.

13. Massage Therapy -- Massage involves manual techniques that include applying fixed or movable pressure, holding and/or causing movement of or to the body, using primarily the hands. These techniques affect the musculoskeletal, circulatory-lymphatic, nervous, and other systems of the body with the intent of improving a person's well-being or health. The most widely used forms of massage therapy include Swedish massage, deep-tissue massage, sports massage, neuromuscular massage, and manual
lymph drainage. Massage therapy is considered medically necessary as adjunctive treatment to another therapeutic procedure on the same day, which is designed to restore muscle function, reduce edema, improve joint motion, or for relief of muscle spasm. Massage therapy is not considered medically necessary for prolonged periods and should be limited to the initial or acute phase of an injury or illness (i.e., an initial 2-week period).

14. Myofascial Release -- Soft tissue mobilization through manipulation. Skilled manual techniques (active and/or passive) are applied to soft tissue to effect changes in the soft tissues, articular structures, neural or vascular systems. Examples are facilitation of fluid exchange, restoration of movement in acutely edematous muscles, or stretching of shortened connective tissue. This procedure is considered medically necessary for treatment of restricted motion of soft tissues in involved extremities, neck, and trunk.

15. Neuromuscular Reeducation -- This therapeutic procedure is provided to improve balance, coordination, kinesthetic sense, posture, and proprioception to a person who has had muscle paralysis and is undergoing recovery or regeneration. Goal is to develop conscious control of individual muscles and awareness of position of extremities. The procedure may be considered medically necessary for impairments which affect the body's neuromuscular system (e.g., poor static or dynamic sitting/standing balance, loss of gross and fine motor coordination, hypo/hypertonicity) that may result from disease or injury such as severe trauma to nervous system, cerebral vascular accident and systemic neurological disease. Standard treatment is 12 to 18 visits within a 4- to 6-week period.

16. Orthotic Training -- Training and re-education with braces and/or splints (orthotics). Considered medically necessary for persons who meet criteria for a brace or splint. See CPB 0009 - Orthopedic Casts, Braces and Splints. There should be distinct treatments rendered when orthotic training for a lower extremity is done during the same visit as gait training, or self-care/home management training. It is unusual to require more than 30 mins of static orthotics training. In some cases, dynamic training may require additional time.

17. Paraffin Bath -- Also known as hot wax treatment, this involves supervised application of heat (via hot wax) to an extremity to relieve pain and facilitate movement. This is considered medically necessary for pain relief in chronic joint problems of the wrists, hands or feet. One or 2 visits is usually sufficient to educate the individual in home use and to evaluate effectiveness. See also CPB 0540 - Heating Devices.

18. Prosthetic checkout -- These assessments are considered medically necessary when a device is newly issued or there is a modification or re-issue of the device. These assessments are considered medically necessary when member experiences loss of function directly related to the orthotic or prosthetic device (e.g., pain, skin breakdown, or falls. Usually, no more than 30 mins of time is necessary.
19. Prosthetic Training -- Training and re-education with artificial devices (prosthetics). Considered medically necessary for persons with a medically necessary prosthetic. There should be distinct goals and services rendered when prosthetic training for a lower extremity is done during the same visit as gait training or self care/home management training. Periodic visits beyond the 3rd month may be reviewed for medical necessity. It is unusual to require more than 30 mins of prosthetic training on a given date.

20. Therapeutic activities -- This procedure involves using functional activities (e.g., bending, lifting, carrying, reaching, pushing, pulling, stooping, catching and overhead activities) to improve functional performance in a progressive manner. The activities are usually directed at a loss or restriction of mobility, strength, balance or coordination. They require the professional skills of a provider and are designed to address a specific functional need of the member. This intervention may be appropriate after a patient has completed exercises focused on strengthening and range of motion but need to be progressed to more function-based activities. These dynamic activities must be part of an active treatment plan and directed at a specific outcome.

21. Therapeutic Exercises -- Instructing a person in exercises and directly supervising the exercises. Purpose is to develop and/or maintain muscle strength and flexibility including range of motion, stretching and postural drainage. Therapeutic exercise is performed with a patient either actively, active-assisted, or passively (e.g., treadmill, isokinetic exercise lumbar stabilization, stretching, strengthening). Therapeutic exercise is considered medically necessary for loss or restriction of joint motion, strength, functional capacity or mobility which has resulted from disease or injury. Standard treatment is 12 to 18 visits within a 4- to 6-week period. Note: Exercising done subsequently by the member without a physician or therapist present and supervising would not be covered.

22. Traction -- Manual or mechanical pull on extremities or spine to relieve spasm and pain -- supervised. Considered medically necessary for chronic back or neck pain. This modality, when provided by physicians or physical therapists, is typically used in conjunction with therapeutic procedures, not as an isolated treatment. Standard treatment is to provide supervised mechanical traction up to 4 sessions per week. For cervical radiculopathy, treatment beyond 1 month can usually be accomplished by self-administered mechanical traction in the home. See also CPB 0453 - Cervical Traction Devices, and CPB 0569 - Lumbar Traction Devices.

23. Ultrasound -- Deep heat by high frequency sound waves to relieve pain, improve healing -- constant attendance. This modality is considered medically necessary to treat arthritis, inflammation of periarticular structures, neuromas, and to soften adhesive scars. Standard treatment is 3 to 4 treatments per week for 1 month. Considered experimental and investigational as a treatment for asthma, bronchitis or other pulmonary conditions.
24. Vasopneumatic Device -- Pressure application by special equipment to reduce swelling -- supervised. It may be considered necessary to reduce edema after acute injury. Education for use of lymphedema pump in the home usually requires 1 or 2 sessions. Further treatment of lymphedema by the provider after the educational visits are generally not considered medically necessary. See also CPB 0062 - Burn Garments, and CPB 0069 - Lymphedema.

25. Wheelchair management training -- This procedure is considered medically necessary only when it requires the professional skills of a provider, is designed to address specific needs of the member, and must be part of an active treatment plan directed at a specific goal. The member must have the capacity to learn from instructions. Typically, 3 to 4 total sessions are sufficient.

26. Whirlpool -- These modalities involve supervised use of agitated water in order to relieve muscle spasm, improve circulation, or cleanse wounds e.g., ulcers, exfoliative skin conditions. Considered medically necessary to relieve pain and promote relaxation to facilitate movement in persons with musculoskeletal conditions. Also considered medically necessary for wound cleansing. It is not considered medically necessary to provide more than 1 hydrotherapy modality (e.g., whirlpool, Hubbard tank, aquatic therapy) performed on the same day. See also CPB 0450 - Fluidized Therapy (Fluidotherapy); CPB 0429 - Bathroom and Toilet Equipment and Supplies; and CPB 0699 - Dry Hydrotherapy (Hydromassage, Aquamassage, Water Massage).

Certain physical medicine modalities and therapeutic are considered duplicative in nature and it would be inappropriate to perform or bill for these services during the same session, such as:

1. Functional activities and ADL
2. Infrared and ultraviolet
3. Massage therapy and myofascial release
4. Microwave and infrared
5. Orthotics training and prosthetic training
6. Whirlpool and Hubbard tank.

The medical necessity of neuromuscular re-education, therapeutic exercises, kinetic activities, and/or therapeutic activities, performed on the same day, must be documented in the medical record.

Only 1 heat modality would be considered medically necessary during the same treatment session. An exception to this is ultrasound (a deep heat), which may be considered medically necessary with 1 superficial heat modality but is not considered medically necessary with other deep heat modalities.

The Interactive Metronome Program:

The Interactive Metronome (IM) program is designed for processing speed, focus, as well as coordination. Trainees wear headphones and hear a fixed, repeating reference beat; they press against a hand or foot sensor to try to match it, while
receiving visual and auditory feedback. The IM program has been promoted as a treatment for children with attention-deficit hyperactivity disorder (ADHD) and for other special needs children to increase concentration, focus, and coordination. It has also been promoted to improve athletic performance, to assess and improve academic performance of normal children, and to improve children's performance in the arts (e.g., dance, music, theater, creative arts). Furthermore, the IM program has also been implemented as part of a therapy program for patients with balance disorders, cerebrovascular accident, limb amputation, multiple sclerosis, Parkinson's disease, and traumatic brain injury.

Schaffer et al (2001) examined the effects of the IM program on selected aspects of motor and cognitive skills in a group of children with ADHD. The study included 56 boys who were 6 years to 12 years of age and diagnosed before they entered the study as having ADHD. The participants were pre-tested and randomly assigned to one of three matched groups. A group of 19 participants receiving 15 hours of IM training exercises were compared with a group receiving no intervention and a group receiving training on selected computer video games. A significant pattern of improvement across 53 of 58 variables favoring the IM program was found. Additionally, several significant differences were found among the treated groups and between pre-treatment and post-treatment factors on performance in areas of attention, motor control, language processing, reading, and parental reports of improvements in regulation of aggressive behavior. The authors concluded that the IM program appears to facilitate a number of capacities, including attention, motor control, and selected academic skills, in boys with ADHD.

In a case report, Bartscherer and Dole (2005) described the use of the IM program for improving timing and coordination in a 9-year old boy who had difficulties in attention and developmental delay of unspecified origin. The subject underwent a 7-week training with the program. Before, during, and after training, timing accuracy was evaluated with testing procedures consistent with the IM training protocol. Before and after training, the subject's gross and fine motor skills were examined with the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP). The child exhibited marked change in scores on both timing accuracy and several BOTMP subtests. Additionally his mother relayed anecdotal reports of changes in behavior at home. This child's participation in a new intervention for improving timing and coordination was associated with changes in timing accuracy, gross and fine motor abilities, and parent reported behaviors. The authors noted that these findings warrant further study.

Cosper et al (2009) examined the effectiveness of IM (Interactive Metronome, Sunrise, FL) training in a group of children with mixed attentional and motor coordination disorders to further explore which subcomponents of attentional control and motor functioning the training influences. A total of 12 children who had been diagnosed with ADHD, in conjunction with either developmental coordination disorder (n = 10) or pervasive developmental disorder (n = 2), underwent 15 1-hr sessions of IM training over a 15-week period. Each child was assessed before and after the treatment using measures of attention, coordination, and motor control to determine the effectiveness of training on these cognitive and behavioral realms. As a group, the children made significant improvements in complex visual choice reaction time and visuomotor control after the training.
There were, however, no significant changes in sustained attention or inhibitory control over inappropriate motor responses after treatment. These results suggested IM training may address deficits in visuomotor control and speed, but appears to have little effect on sustained attention or motor inhibition.

In a review on autism, Levy and colleagues (2009) stated that popular biologically based treatments include anti-infectives, chelation medications, gastrointestinal medications, hyperbaric oxygen therapy, and intravenous immunoglobulins. Non-biologically based treatments include auditory integration therapy, chiropractic therapy, cranio-sacral manipulation, facilitated communication, IM, and transcranial stimulation. However, few studies have addressed the safety and effectiveness of most of these treatments.

Currently, there is insufficient evidence in the peer-reviewed medical literature to support the effectiveness of the IM program. Randomized controlled studies are needed to establish the clinical value of this program.

**Augmented Soft Tissue Mobilization:**

Augmented soft tissue mobilization (ASTM), a non-invasive mobilization technique, is used by chiropractors as well as massage, occupational, and physical therapists to treat chronic musculoskeletal disorders that result from scarring and fibrosis. It entails the use of hand-held tools made from bone or stone or metal and a lubricant on the skin to scrape and mobilize scar tissue. Scrapping is done to promote circulation, thus, promoting healing. Manual and other treatments may also be used with exercise to guide the healing process. Treatments with ASTM are often administered on non-consecutive days, 1 to 2 times per week. A typical 30-min session usually includes 15 mins of treatment and 15 mins of exercise and assessment. Less severe conditions reportedly can respond well in 2 to 4 sessions whereas difficult chronic cases may require 8 to 16 sessions. However, there is insufficient evidence to support the effectiveness of ASTM.

In a case report, Melham et al (1998) described their finding on the use of ASTM in the treatment of excessive scar tissue around an athlete's injured ankle. Surgery and several months of conventional physical therapy failed to alleviate the athlete's symptoms. As a final resort, ASTM was administered. It used ergonomically designed instruments that assist therapists in the rapid localization and effective treatment of areas exhibiting excessive soft tissue fibrosis; followed by a stretching and strengthening program. Upon the completion of 6 weeks of ASTM, the athlete had no pain and had regained full range of motion and function.

**Kinesio Taping:**

Kinesio taping is a method of taping utilizing a specialized type of tape. It differs from traditional white athletic tape in the sense that it is elastic and can be stretched to 140% of its original length before being applied to the skin. It subsequently provides a constant pulling (shear) force to the skin over which it is applied unlike traditional white athletic tape. The fabric of this specialized tape is air permeable and water resistant and can be worn for repetitive days. Kinesio tape is being used immediately following injury and during the rehabilitation process. However, its effectiveness has yet to be established.
Halseth et al (2004) examined if Kinesio taping the anterior and lateral portion of the ankle would enhance ankle proprioception compared to the untaped ankle. A total of 30 subjects (15 men, 15 women, aged 18 to 30 years) participated in this study. Exclusion criteria: included ankle injury less than 6 months prior to testing, significant ligament laxity as determined through clinical evaluation, or any severe foot abnormality. Experiment utilized a single group, pre-test and post-test. Plantar flexion and inversion with 20° of plantar flexion reproduction of joint position sense (RJPS) was determined using an ankle RJPS apparatus. Subjects were bare-footed, blind-folded, and equipped with headphones playing white noise to eliminate auditory cues. They had 5 trials in both plantar flexion and inversion with 20° plantar flexion before and after application of the Kinesio tape to the anterior/lateral portion of the ankle. Constant error and absolute error were determined from the difference between the target angle and the trial angle produced by the subject. The treatment group (Kinesio taped subjects) showed no change in constant and absolute error for ankle RJPS in plantar flexion and 20° of plantar flexion with inversion when compared to the untaped results using the same motions. The application of Kinesio tape does not appear to enhance proprioception (in terms of RJPS) in healthy individuals as determined by measures of RJPS at the ankle in the motions of plantar flexion and 20° of plantar flexion with inversion. The authors stated that in order to fully understand the effect of Kinesio tape on proprioception, further research needs to be conducted on other joints, on the method of application of Kinesio tape, and the health of the subject to whom it is applied. In addition, further research may provide vital information about a possible benefit of Kinesio taping during the acute and sub-acute phases of rehabilitation, thus facilitating earlier return to activity participation.

In a pilot study, Yasukawa and colleagues (2006) described the use of the Kinesio taping method for the upper extremity in enhancing functional motor skills in children admitted into an acute rehabilitation program. A total of 15 children (10 females and 5 males; 4 to 16 years of age), who were receiving rehabilitation services at the Rehabilitation Institute of Chicago participated in this study. For 13 of the inpatients, this was the initial rehabilitation following an acquired disability, which included encephalitis, brain tumor, cerebral vascular accident, traumatic brain injury, and spinal cord injury. The Melbourne Assessment of Unilateral Upper Limb Function (Melbourne Assessment) was used to measure upper-limb functional change prior to use of Kinesio tape, immediately after application of the tape, and 3 days after wearing tape. Children’s upper-limb function was compared over the three assessments using analysis of variance. The improvement from pre- to post-taping was statistically significant, F(1, 14) = 18.9; p < 0.02. The authors concluded that these results suggested that Kinesio tape may be associated with improvement in upper-extremity control and function in the acute pediatric rehabilitation setting. The use of Kinesio Tape as an adjunct to treatment may assist with the goal-focused occupational therapy treatment during the child’s inpatient stay. Moreover, they stated that further study is recommended to test the effectiveness of this method and to determine the lasting effects on motor skills and functional performance once the tape is removed.

In a pilot study, Fu and associates (2008) examined the possible immediate and delayed effects of Kinesio taping on muscle strength in quadriceps and hamstring when taping is applied to the anterior thigh of healthy young athletes. A total of 14
healthy young athletes (7 males and 7 females) free of knee problems were enrolled in this study. Muscle strength of the subject was assessed by the isokinetic dynamometer under three conditions: (i) without taping; (ii) immediately after taping; (iii) 12 hours after taping with the tape remaining in situ. The result revealed no significant difference in muscle power among the three conditions. Kinesio taping on the anterior thigh neither decreased nor increased muscle strength in healthy non-injured young athletes.

In a prospective, randomized, double-blinded, clinical study using a repeated-measures design, Thelen et al (2008) determined the short-term clinical efficacy of Kinesio tape when applied to college students with shoulder pain, as compared to a sham tape application. A total of 42 subjects with clinically diagnosed rotator cuff tendonitis and/or impingement were randomly assigned to 1 of 2 groups: therapeutic Kinesio tape group or sham Kinesio tape group. Subjects wore the tape for 2 consecutive 3-day intervals. Self-reported pain and disability and pain-free active ranges of motion (ROM) were measured at multiple intervals to evaluate for differences between groups. The therapeutic Kinesio tape group showed immediate improvement in pain-free shoulder abduction (mean +/- SD increase, 16.9 degrees +/- 23.2 degrees; p = 0.005) after tape application. No other differences between groups regarding ROM, pain, or disability scores at any time interval were found. The authors concluded that Kinesio tape may be of some assistance to clinicians in improving pain-free active ROM immediately after tape application for patients with shoulder pain. Utilization of Kinesio tape for decreasing pain intensity or disability for young patients with suspected shoulder tendonitis/impingement is not supported.

McConnell (2002) noted that the management of chronic low back pain (LBP) and leg pain has always provided a challenge for therapists. This researcher examined the influence of a repetitive movement such as walking as a possible causative factor of chronic LBP. Diminished shock absorption as well as limited hip extension and external rotation are hypothesized to affect the mobility of the lumbar spine resulting in lumbar spine dysfunction. Treatment must therefore be directed not only at increasing the mobility of the hips and thoracic spine, but also the stability of the lumbar spine. However, the symptoms can sometimes be exacerbated by treatment, so the neural tissue needs to be unloaded to optimize the treatment outcome. This can be achieved by taping the buttock and down the leg following the dermatome to shorten the inflamed tissue.

While taping has a role in the management of musculoskeletal pain and injuries, its use in the management of LBP has not been established. In a review of LBP in athletes, Baker and Patel (2005) stated that most of the adult population experiences LBP at some time in life. Athletes may be at increased risk, but outcomes are good. The majority of LBP in adult athletes is mechanical in nature. Herniated discs, spinal stenosis, spondylitis, and sacral stress fractures can also cause LBP in these individuals. Low back conditions mentioned above may be treated with rest, medication, as well as specific exercise programs. Surgery is indicated for severe spinal stenosis, pain with evidence of neurological compromise, and some painful deformities. Newer treatments for back pain are emerging, but few controlled clinical trials are available. Taping was not mentioned as an option for managing individuals with LBP. Additionally, in a review of current concepts in the diagnosis and treatment of spondylolysis,
McCleary and Congeni (2007) noted that treatment usually consists of rest and/or bracing to allow healing to occur, followed by rehabilitation that includes core strengthening. They stated that more large-scale controlled studies are needed to clarify the most effective diagnostic and therapeutic protocols. Furthermore, in reviews of treatment for subacute and chronic LBP (Chou, 2009) and occupational LBP (Kraeciw and Atlas, 2009), as well as review of rehabilitation program for the low back (Sheon and Duncombe, 2009), taping is not mentioned as an option.

Greig et al (2008) noted that greater thoracic kyphosis is associated with increased biomechanical loading of the spine which is potentially problematic in individuals with osteoporotic vertebral fractures. Conservative interventions that reduce thoracic kyphosis warrant further investigation. These researchers examined the effects of therapeutic postural taping on thoracic posture. Secondary aims explored the effects of taping on trunk muscle activity and balance. A total of 15 women with osteoporotic vertebral fractures participated in this within-participant design study. Three taping conditions were randomly applied: (i) therapeutic taping, (ii) control taping, and (iii) no taping. Angle of thoracic kyphosis was measured after each condition. Force plate-derived balance parameters and trunk muscle electromyographic activity (EMG) were recorded during 3 static standing tasks of 40-second duration. There was a significant main effect of postural taping on thoracic kyphosis (p = 0.026), with a greater reduction in thoracic kyphosis after taping compared with both control tape and no tape. There were no effects of taping on EMG or balance parameters. The authors concluded that these findings showed that the application of postural therapeutic tape in a population with osteoporotic vertebral fractures induced an immediate reduction in thoracic kyphosis. They stated that further research is needed to investigate the underlying mechanisms associated with this decrease in kyphosis.

The American College of Occupational and Environmental Medicine’s practice guidelines on “Evaluation and management of common health problems and functional recovery in workers” (Hegmann, 2007) did not recommend taping or kinesiotaping for acute, subacute, or chronic LBP, radiculary pain syndromes or other back-related conditions.

González-Iglesias et al (2009) examined the short-term effects of Kinesio taping, applied to the cervical spine, on neck pain and cervical ROM in individuals with acute whiplash-associated disorders (WADs). A total of 41 patients (21 females) were randomly assigned to 1 of 2 groups: (i) the experimental group received Kinesio taping to the cervical spine (applied with tension) and (ii) the placebo group received a sham Kinesio taping application (applied without tension). Both neck pain (11-point numerical pain rating scale) and cervical ROM data were collected at baseline, immediately after the Kinesio tape application, and at a 24-hr follow-up by an assessor blinded to the treatment allocation of the patients. Mixed-model analyses of variance (ANOVAs) were used to examine the effects of the treatment on each outcome variable, with group as the between-subjects variable and time as the within-subjects variable. The primary analysis was the group-by-time interaction. The group-by-time interaction for the 2-by-3 mixed-model ANOVA was statistically significant for pain as the dependent variable (F = 64.8; p < 0.001), indicating that patients receiving Kinesio taping experienced a greater decrease in pain immediately post-application and at the 24-hr follow-up (both, p <
0.001). The group-by-time interaction was also significant for all directions of cervical ROM: flexion (F = 50.8; p < 0.001), extension (F = 50.7; p < 0.001), right (F = 39.5; p < 0.001) and left (F = 3.8; p < 0.05) lateral flexion, and right (F = 33.9, p < 0.001) and left (F = 39.5, p < 0.001) rotation. Patients in the experimental group obtained a greater improvement in ROM than those in the control group (all, p < 0.001). The authors concluded that patients with acute WAD receiving an application of Kinesio taping, applied with proper tension, exhibited statistically significant improvements immediately following application of the Kinesio tape and at a 24-hr follow-up. However, the improvements in pain and cervical ROM were small and may not be clinically meaningful. They stated that future studies should investigate if Kinesio taping provides enhanced outcomes when added to physical therapy interventions with proven efficacy or when applied over a longer period.

In a single-center, randomized, and double-blind study, Karadag-Saygi and colleagues (2010) evaluated the effect of kinesiotaping as an adjuvant therapy to botulinum toxin A (BTX-A) injection in lower extremity spasticity. A total of 20 hemiplegic patients with spastic equinus foot were enrolled into the study and randomized into 2 groups. The first group (n = 10) received BTX-A injection and kinesiotaping, and the second group (n = 10) received BTX-A injection and sham taping. Clinical assessment was done before injection and at 2 weeks and 1, 3, and 6 months. Outcome measures were modified Ashworth scale (MAS), passive ankle dorsiflexion, gait velocity, and step length. Improvement was recorded in both kinesiotaping and sham groups for all outcome variables. No significant difference was found between groups other than passive range of motion (ROM), which was found to have increased more in the kinesiotaping group at 2 weeks. The authors concluded that there is no clear benefit in adjuvant kinesiotaping application with botulinum toxin for correction of spastic equinus in stroke.

In a pilot, feasibility study, Kalichman and colleagues (2010) evaluated the effect of Kinesio taping treatment approach on meralgia paresthetica (MP) symptoms. Men (n = 6) and women (n = 4) with clinically and electromyographically diagnosed MP received application of Kinesio tape, twice-weekly for 4 weeks (8 treatment sessions in total). Main outcome measures were visual analog scale (VAS) of MP symptoms (pain/burning sensation/paresthesia), VAS global quality of life (QOL); and the longest and broadest parts of the symptom area were measured. All outcome measures significantly improved after 4 weeks of treatment. Mean VAS QOL +/- SD decreased from 69.0 +/- 23.4 to 35.3 +/- 25.2 (t = 4.3; p = 0.002). Mean VAS of MP symptoms +/- SD decreased from 60.5 +/- 20.8 to 31.4 +/- 26.6 (t = 5.9; p > 0.001). Length and width of affected area decreased from 25.5 +/- 5.5 to 13.7 +/- 6.7 (t = 5.1; p > 0.001) and 15.3 +/- 2.1 to 7.4 +/- 4.3 (t = 5.3; p > .001), respectively. The authors concluded that Kinesio taping can be used in the treatment of MP. Moreover, they stated that future randomized, placebo-controlled trials should be designed with patients and assessors blind to the type of intervention.

Kaya et al (2011) compared the effectiveness of Kinesio tape and physical therapy modalities in patients with shoulder impingement syndrome. Patients (n = 55) were treated with Kinesio tape (n = 30) 3 times by intervals of 3 days or a daily program of local modalities (n = 25) for 2 weeks. Response to treatment was evaluated with the Disability of Arm, Shoulder, and Hand scale. Patients were questioned for the night pain, daily pain, and pain with motion. Outcome
measures except for the Disability of Arm, Shoulder, and Hand scale were assessed at baseline, first, and second weeks of the treatment. Disability of Arm, Shoulder, and Hand scale was evaluated only before and after the treatment. Disability of Arm, Shoulder, and Hand scale and VAS scores decreased significantly in both treatment groups as compared with the baseline levels. The rest, night, and movement median pain scores of the Kinesio taping (20, 40, and 50, respectively) group were statistically significantly lower (p values were 0.001, 0.01, and 0.001, respectively) at the first week examination as compared with the physical therapy group (50, 70, and 70, respectively). However, there was no significant difference in the same parameters between the two groups at the second week (0.109, 0.07, and 0.218 for rest, night, and movement median pain scores, respectively). Disability of Arm, Shoulder, and Hand scale scores of the Kinesio taping group were significantly lower at the second week as compared with the physical therapy group. No side effects were observed. Kinesio tape has been found to be more effective than the local modalities at the first week and was similarly effective at the second week of the treatment. The authors stated that Kinesio taping may be an alternative treatment option in the treatment of shoulder impingement syndrome especially when an immediate effect is needed. The findings of this small study need to be validated by well-designed studies.

Ankle sprains are common in sports and the fibularis muscles play a role in providing functional stability of the ankle. Prophylactic ankle taping with non-elastic sports tape has been used to restrict ankle inversion, while Kinesio tape is elastic and has not been studied for that purpose. In a controlled study, Briem and colleagues (2011) examined the effect of 2 adhesive tape conditions compared to a no tape condition on muscle activity of the fibularis longus during a sudden inversion perturbation in male athletes (soccer, team handball, basketball). A total of 51 male premier-league athletes were tested for functional stability of both ankles with the Star Excursion Balance Test. Based on the results, those with the 15 highest and those with the 15 lowest stability scores were selected for further testing. Muscle activity of the fibularis longus was recorded with surface electromyography during a sudden inversion perturbation. Each participant was tested under 3 conditions: (i) with the ankle taped with non-elastic, white sports tape, (ii) Kinesio tape, and (iii) with no tape. Differences in mean muscle activity were evaluated with a 3-way mixed model ANOVA for the 3 conditions across four 500-ms time-frames (within subject factors) and between the 2 groups of stable versus unstable participants (between subjects factor). Differences in peak muscle activity and in the time to peak muscle activity were evaluated with a 2-way mixed model ANOVA for the 3 conditions (within subjects factor), between the 2 groups (between subjects factor). Significantly greater mean muscle activity was found when ankles were taped with non-elastic tape compared to no tape, while Kinesio tape had no significant effect on mean or maximum muscle activity compared to the no tape condition. Neither stability level nor taping condition had a significant effect on the amount of time from perturbation to maximum activity of the fibularis longus muscle. The authors concluded that non-elastic sports tape may enhance dynamic muscle support of the ankle. The efficacy of Kinesio tape in preventing ankle sprains via the same mechanism is unlikely as it had no effect on muscle activation of the fibularis longus.

MEDEK Therapy:
MEDEK, a form of physiotherapy, refers to Metodo Dinamico de Estimulacion Kinesica or Dynamic Method for Kinetic Stimulation. It was developed by a
Chilean physical therapist in the 1970s. MEDEK is used for developing gross
motor skills in children with physical disabilities and movement disorders (e.g.,
cerebral palsy, Down syndrome, hypotonia, muscular dystrophy, and
developmental motor delay). It does not focus on modifying muscle tone, primitive
reflexes or abnormal patterns of movement. It focuses on training movements
leading to sitting, standing, and walking. Muscles are trained in postural and
functional tasks rather than in isolation. Tight muscles are stretched in dynamic
situations. The motor developmental sequence is not used. MeDEK assumes
that different skills require different movement strategies. Unlike other
interventions, tasks are performed without the child’s attention, conscious thought
or co-operation. It is assumed that motivation will increase temporary
performance only but will not create a permanent change. The therapist’s task is
to provoke automatic postural reactions that contribute to the postural control
needed for functional tasks. Well-designed clinical studies are needed to
ascertain the effectiveness of MEDEK.

Hands-Free Ultrasound:

Gulick (2010) noted that a "hands-free" ultrasound (US) device was recently
introduced by Rich-Ma, Inc. This unit allows the clinician to choose the mode of
US delivery, using either a hand-held (manual) transducer or a hands-free device
that pulses the US beam through the transducer. However, the Center for
Medicare and Medicaid Services has deemed delivery of US via a hands-free unit
to be investigational. This investigator examined the effectiveness of tissue
heating with a hands-free US technique compared to a hand-held US transducer
using the Rich-Mar AutoSound unit. A total of 40 volunteers over 18 years of age
participated. Treatment was provided at a 3-MHz US frequency. Muscle
temperature was measured with 26-gauge, 4-cm Physiotemp thermistors placed in
the triceps surae muscle. The depth of thermistor placement was at 1-cm and 2-
cm deep. One calf was treated with a manual transducer (5-cm(2) US head at 3
times the effective radiating area [ERA]), and one calf was treated with the hands-
free transducer (14-cm(2) [ERA]). Both methods used a 1.5 W/cm(2) intensity for
10 mins. The manual technique used an overlapping circular method at 4 cm/sec,
and the hands-free method used a sequential pulsing at 4 cm/sec. Tissue
temperatures were recorded at baseline and every 30 seconds. The hands-free
technique resulted in a tissue temperature increase from 33.68 to 38.7 degrees C
and an increase from 33.45 to 40.1 degrees C using the manual technique at 1-cm
depth. The tissue temperature increase at the 2-cm depth was from 34.95 to
35.44 degrees C for the hands-free device and 34.44 to 38.42 degrees C for the
manual device. Thus, there was a significant difference between the hands-free
and the manual mode of US delivery for the 3-MHz frequency (5.02 degrees C
versus 6.65 degrees C at 1 cm and 1.49 degrees C versus 3.98 degrees C at 2
cm). In this study, the "hands-free" device did not result in the same level of tissue
heating as the manual technique. The hands-free device has the advantage of not
needing a clinician present to deliver the modality but a therapeutic level of heating
was not achieved at the 2-cm tissue depth. Thus, the effectiveness of the "hands-
free" treatment is in question.
Hivamat Therapy (Deep Oscillation Therapy):

Hivamat therapy (deep oscillation therapy) utilizes an intermittent electrostatic field via a Hivamat machine. It supposedly penetrates deeper into the body tissue than manual methods, allowing previously “untreatable” injuries to be manipulated with a minimum of physical pressure. Electrostatic waves create a kneading effect deep within the damaged tissues, restoring flexibility and blood supply to the affected area.

Aliyev (2009) noted that in Germany approximately 2 million sports injuries occur per year. Most common are distortions and ligamentous injury going along with post-traumatic lymphedema. Deep oscillation therapy provided very good results in lymph drainage and in other indications. The purpose of this experimental study was the evaluation of the effects of deep oscillation therapy in immediate therapy and after-care of different sports injuries in addition to usual care (complex physical and medical therapy). Two soccer teams were supported by a sports medicine section of a rehabilitation hospital. In 14 people (mean age of 23.9 years), 49 sports injuries of different kind were treated. Subjective rating of the symptoms by VAS improved significant (p = 0.001) from 8.7 (baseline) to 2.1 points (post-treatment). Objective rating by the attending physician according to different clinically relevant parameters lead to “very good” or “good” results in 90% of the patients. The authors concluded that deep oscillation therapy is an easy to use and comparably cost-effective adjuvant therapy option. These investigators already had good experience with it in other indications concerning re-absorption of edema, reducing pain, anti-inflammatory effect, promotion of motricity, promotion of wound healing, anti-fibrotic effect and improvement in trophicity and quality of the tissue. All these mentioned effects can be confirmed in the treatment of patients with acute sports injury and trauma. The soft mode of action is the reason that in contrast to other electric and mechanical therapies it is no contraindication in immediate therapy. In general the authors noted no side effects; patients were highly compliant and rated this therapy as very good. Limitations of this small study (n = 14) were its retrospective and uncontrolled nature; findings were also confounded by the concomitant use of usual care.

Applied Functional Science:

Applied Functional Science (AFS) combines physical sciences, biological sciences, and behavioral sciences to create a system for functional assessment, rehabilitation, training, and conditioning, as well as injury prevention. The advocates of AFS note that these principles, integrated with neuromusculoskeletal Chain Reaction™ biomechanics, lead to strategies that guide the decision-making process. However, there is a lack of evidence regarding the clinical value of this approach.

Myofascial Physical Therapy for Pelvic Pain Syndromes:

Fitzgerald et al (2013) determined the feasibility of conducting a randomized clinical trial designed to compare 2 methods of manual therapy (myofascial physical therapy and global therapeutic massage) in patients with urological chronic pelvic pain syndromes. They recruited 48 subjects with chronic prostatitis/chronic pelvic pain syndrome or interstitial cystitis/painful bladder
syndrome at 6 clinical centers. Eligible patients were randomized to myofascial physical therapy or global therapeutic massage and were scheduled to receive up to 10 weekly treatments of 1-hour each. Criteria to assess feasibility included adherence of therapists to prescribed therapeutic protocol as determined by records of treatment, adverse events during study treatment and rate of response to therapy as assessed by the patient global response assessment. Primary outcome analysis compared response rates between treatment arms using Mantel-Haenszel methods. There were 23 (49 %) men and 24 (51 %) women randomized during a 6-month period. Of the patients 24 (51 %) were randomized to global therapeutic massage, 23 (49 %) to myofascial physical therapy and 44 (94 %) completed the study. Therapist adherence to the treatment protocols was excellent. The global response assessment response rate of 57 % in the myofascial physical therapy group was significantly higher than the rate of 21 % in the global therapeutic massage treatment group (p = 0.03). The authors concluded the preliminary findings of a beneficial effect of myofascial physical therapy warrants further study. They stated that they are conducting a second small study comparing myofascial physical therapy and global therapeutic massage (with a sample size of approximately 90 at 11 sites.

Pontari and Giusto (2013) described new developments in the diagnosis and treatment of chronic prostatitis/chronic pelvic pain syndrome (CPPS). Symptoms in men with chronic prostatitis/CPPS appear to cluster into a group with primarily pelvic or localized disease, and a group with more systemic symptoms. Several other chronic pain conditions can be associated with chronic prostatitis/CPPS, including irritable bowel syndrome, fibromyalgia, and chronic fatigue syndrome. Markers of neurologic inflammation and autoimmune disease parallel changes in symptoms after treatment. Treatment options include new alpha-blockers, psychological intervention, and prostate-directed therapy. The areas of acupuncture and pelvic floor physical therapy/myofascial release have received increased recent attention and appear to be good options in these patients. Future therapy may include antibodies to mediators of neurogenic inflammation and even treatment of bacteria in the bowel. The authors concluded that the diagnosis of chronic prostatitis/CPPS must include conditions traditionally outside the scope of urologic practice but important for the care of men with chronic pelvic pain. The treatment is best done using multiple simultaneous therapies aimed at the different aspects of the condition.

Fitzgerald et al (2013) determined the feasibility of conducting a randomized clinical trial designed to compare 2 methods of manual therapy (myofascial physical therapy and global therapeutic massage) in patients with urological CPPS. These researchers recruited 48 subjects with chronic prostatitis/CPPS or interstitial cystitis/painful bladder syndrome at 6 clinical centers. Eligible patients were randomized to myofascial physical therapy or global therapeutic massage and were scheduled to receive up to 10 weekly treatments of 1 hour each. Criteria to assess feasibility included adherence of therapists to prescribed therapeutic protocol as determined by records of treatment, adverse events during study treatment and rate of response to therapy as assessed by the patient global response assessment. Primary outcome analysis compared response rates between treatment arms using Mantel-Haenszel methods. There were 23 (49 %) men and 24 (51 %) women randomized during a 6-month period. Of the patients 24 (51 %) were randomized to global therapeutic massage, 23 (49 %) to
myofascial physical therapy and 44 (94%) completed the study. Therapist adherence to the treatment protocols was excellent. The global response assessment response rate of 57% in the myofascial physical therapy group was significantly higher than the rate of 21% in the global therapeutic massage treatment group (p = 0.03). The authors concluded that they judged the feasibility of conducting a full-scale trial of physical therapy methods and the preliminary findings of a beneficial effect of myofascial physical therapy warrants further study.

The European Association of Urology’s guidelines on chronic pelvic pain (Engeler et al, 2012) stated that “There are insufficient data on the effectiveness of myofascial physical therapy for the treatment of PPS (prostate pain syndrome”).

Krauss et al (2011) stated that hip osteoarthritis (OA) is a disease with a major impact on both national economy and the patients themselves. Patients suffer from pain and functional impairment in ADL that are associated with a decrease in QOL. Conservative therapeutic interventions such as physical exercises aim at reducing pain and increasing function and health-related QOL. However, there is only silver level evidence for efficacy of land-based physical exercise in the treatment of hip OA. The purpose of this randomized controlled trial (RCT) is to examine if the specific 12-week exercise regime "Hip School" can decrease bodily pain and improve physical function and QOL in subjects with hip OA. A total of 217 participants with hip OA, confirmed using the clinical score of the American College of Rheumatology, are recruited from the community and randomly allocated to one of the following groups: (i) exercise regime "Hip School", n = 70; (ii) non-intervention control group, n = 70; (iii) "sham" ultrasound group, n = 70; and (iv) ultrasound group, n = 7. The exercise regime combines group exercises (1/week, 60 to 90 mins) and home-based exercises (2/week, 30 to 40 mins). Sham ultrasound and ultrasound are given once-weekly (15 mins). Measures were taken directly prior to (M1) and after (M2) the 12-week intervention period. Two follow-ups are conducted by phone 16 and 40 weeks after the intervention period. The primary outcome measure is the change in the subscale bodily pain of the SF36 from M1 to M2. Secondary outcomes comprise the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score, SF36, isometric strength of hip muscles, spatial-temporal and discrete measures derived from clinical gait analysis, and the length of the center of force path in different standing tasks. An intention-to-treat analysis will be performed using multi-variate statistics (group x time). The authors concluded that results from this trial will contribute to the evidence regarding the effect of a hip-specific exercise regime on physical function, pain, and health-related QOL in patients with hip OA.

French et al (2013) determined the effectiveness of exercise therapy (ET) compared with ET with adjunctive manual therapy (MT) for people with hip OA; and identified if immediate commencement of treatment (ET or ET+MT) was more beneficial than a 9-week waiting period for either intervention. Patients (n = 131) with hip OA recruited from general practitioners, rheumatologists, orthopedic surgeons, and other hospital consultants were randomized to 1 of 3 groups: ET (n = 45), ET+MT (n = 43), and wait-list controls (n = 43). Participants in both the ET and ET+MT groups received up to 8 treatments over 8 weeks. Control group participants were re-randomized into either ET or ET+MT groups after 9 week follow-up. Their data were pooled with original treatment group data: ET (n = 66) and ET+MT (n = 65). The primary outcome was the WOMAC physical function
PF) subscale. Secondary outcomes included physical performance, pain severity, hip ROM, anxiety/depression, QOL, medication usage, patient-perceived change, and patient satisfaction. There was no significant difference in WOMAC PF between the ET (n = 66) and ET+MT (n = 65) groups at 9 weeks (mean difference of 0.09; 95 % confidence interval [CI]: -2.93 to 3.11) or 18 weeks (mean difference of 9.42; 95 % CI: -4.41 to 5.25), or between other outcomes, except patient satisfaction with outcomes, which was higher in the ET+MT group (p = 0.02). Improvements in WOMAC, hip ROM, and patient-perceived change occurred in both treatment groups compared with the control group. The authors concluded that self-reported function, hip ROM, and patient-perceived improvement occurred after an 8-week program of ET for patients with OA of the hip; MT as an adjunct to exercise provided no further benefit, except for higher patient satisfaction with outcome.

Bennell et al (2014) stated that there is limited evidence supporting use of physical therapy for hip OA. These investigators examined the effectiveness of physical therapy on pain and physical function in patients with hip OA. Randomized, placebo-controlled, participant- and assessor-blinded trial involving 102 community volunteers with hip pain levels of 40 or higher on a VAS of 100 mm (range of 0 to 100 mm; 100 indicates worst pain possible) and hip OA confirmed by radiograph were included for analysis. A total of 49 patients in the active group and 53 in the sham group underwent 12 weeks of intervention and 24 weeks of follow-up (May 2010 to February 2013). Participants attended 10 treatment sessions over 12 weeks. Active treatment included education and advice, manual therapy, home exercise, and gait aid if appropriate. Sham treatment included inactive ultrasound and inert gel. For 24 weeks after treatment, the active group continued unsupervised home exercise while the sham group self-applied gel 3 times weekly. Primary outcomes were average pain (0 mm, no pain; 100 mm, worst pain possible) and physical function (WOMAC, 0 no difficulty to 100 extreme difficulty) at week 13. Secondary outcomes were these measures at week 36 and impairments, physical performance, global change, psychological status, and QOL at weeks 13 and 36. A total of 96 patients (94 %) completed week 13 measurements and 83 (81 %) completed week 36 measurements. The between-group differences for improvements in pain were not significant. For the active group, the baseline mean (SD) VAS score was 58.8 mm (13.3) and the week-13 score was 40.1 mm (24.6); for the sham group, the baseline score was 58.0 mm (11.6) and the week-13 score was 35.2 mm (21.4). The mean difference was 6.9 mm favoring sham treatment (95 % CI: -3.9 to 17.7). The function scores were not significantly different between groups. The baseline mean (SD) physical function score for the active group was 32.3 (9.2) and the week-13 score was 27.5 (12.9) units, whereas the baseline score for the sham treatment group was 32.4 (8.4) units and the week-13 score was 26.4 (11.3) units, for a mean difference of 1.4 units favoring sham (95 % CI: -3.8 to 6.5) at week 13. There were no between-group differences in secondary outcomes (except greater week-13 improvement in the balance step test in the active group); 19 of 46 patients (41 %) in the active group reported 26 mild adverse effects and 7 of 49 (14 %) in the sham group reported 9 mild adverse events (p = 0.003). The authors concluded that among adults with painful hip OA, physical therapy did not result in greater improvement in pain or function compared with sham treatment, raising questions about its value for these patients.
Yim et al (2015) reviewed the current literature on the effect of physical therapy on healing and QOL outcomes in patients with venous leg ulcers (VLUs) and identified research gaps that warrant further investigation. PubMed (MEDLINE), CINAHL, and Cochrane databases were searched in April 2014. These researchers found 10 articles, consisting of RCTs and single-arm cohort studies with small sample sizes that used physical therapy or exercise for patients with open or healed VLUs. Although there is evidence that exercise strengthens the calf muscle pump and improves ankle ROM, few studies have investigated the effect of these interventions on QOL and healing, and few involved the supervision of a physical therapist. The authors concluded that the lack of evidence and RCTs suggested the need for further investigation on physical therapy-oriented exercise on wound healing and QOL. In addition, more studies are needed to investigate sustainability of the increased ankle ROM after physical therapy has ended or if VLU reoccurrences are prevented.

De Groef et al (2015) reviewed the effectiveness of various post-operative physical therapy modalities and timing of physical therapy following treatment of breast cancer on pain and impaired ROM of the upper limb. These modalities include passive mobilizations, manual stretching, myofascial therapy and active exercises. These investigators searched the following databases: PubMed/MEDLINE, CINAHL, EMBASE, PEDro and Cochrane; articles published until October 2012 were included. Only (pseudo-) RCTs and non-randomized experimental trials investigating the effectiveness of passive mobilizations, manual stretching, myofascial therapy and/or exercise therapy and timing of physical therapy, following treatment for breast cancer, were reviewed. Primary outcomes were pain of the upper limb and/or ROM of the shoulder. Secondary outcomes are decreased shoulder strength, arm lymphedema, limitations in ADL, decreased quality of life and wound drainage volume. Physical therapy modalities had to be started in the first 6 weeks following surgery. Articles were selected by 2 independent researchers in 3 phases and compared for consensus. First the titles were analyzed, then the selected abstracts and finally the full texts. A total of 18 RCTs were included in the review. Three studies investigated the effect of multi-factorial therapy: 2 studies proved that the combination of general exercises and stretching is effective for the treatment of impaired ROM; another study showed that passive mobilizations combined with massage had no beneficial effects on pain and impaired ROM. Fifteen studies investigated the effectiveness of a single physical therapy modality. One study of poor quality found evidence supporting the beneficial effects of passive mobilizations. The only study investigating the effect of stretching did not find any beneficial effects. No studies were found about the effectiveness of myofascial therapy in the post-operative phase. Five studies found that active exercises were more effective compared to no therapy or compared to information on the treatment of impairments of the upper limb. Three studies supported the early start of exercises for recovery of shoulder ROM, while 4 studies supported the delay of exercises to avoid prolonged wound healing. The authors concluded that multi-factorial physical therapy (i.e. stretching and exercises) and active exercises were effective to treat post-operative pain and impaired ROM following treatment for breast cancer. Moreover, they stated that high-quality studies are needed to prove the effectiveness of passive mobilizations, stretching and myofascial therapy as part of the multi-factorial
treatment. In addition, the appropriate timing and content of the exercise programs need to be further investigated.

Michaleff et al (2014) examined the effectiveness of a comprehensive exercise program delivered by physiotherapists compared with advice in people with a chronic whiplash-associated disorder. PROMISE was a 2-group, pragmatic RCT in patients with chronic (greater than 3 months and less than 5 years) grade 1 or 2 whiplash-associated disorder. Participants were randomly assigned by a computer-generated randomization schedule to receive either the comprehensive exercise program (20 sessions) or advice (1 session and telephone support). Sealed opaque envelopes were used to conceal allocation. The primary outcome was pain intensity measured on a 0 to 10 scale. Outcomes were measured at baseline, 14 weeks, 6 months, and 12 months by a masked assessor. Analysis was by intention-to-treat, and treatment effects were calculated with linear mixed models. A total of 172 participants were allocated to either the comprehensive exercise program (n = 86) or advice group (n = 86); 157 (91 %) were followed up at 14 weeks, 145 (84 %) at 6 months, and 150 (87 %) at 12 months. A comprehensive exercise program was not more effective than advice alone for pain reduction in the participants. At 14 weeks the treatment effect on a 0 to 10 pain scale was 0.0 (95 % CI: -0.7 to 0.7), at 6 months 0.2 (-0.5 to 1.0), and at 12 months -0.1 (-0.8 to 0.6). Central nervous system hyper-excitability and symptoms of post-traumatic stress did not modify the effect of treatment. These researchers recorded no serious adverse events. The authors concluded that simple advice is equally as effective as a more intense and comprehensive physiotherapy exercise program in the treatment of whiplash-associated disorder. They stated that the need to identify effective and affordable strategies to prevent and treat acute through to chronic whiplash associated disorders is an important health priority; future avenues of research might include improving understanding of the mechanisms responsible for persistent pain and disability, investigating the effectiveness and timing of drugs, and study of content and delivery of education and advice.

Appendix:

Physical therapy should be provided in accordance with an ongoing, written plan of care. The purpose of the written plan of care is to assist in determining medical necessity and should include the following:

The written plan of care should be sufficient to determine the medical necessity of treatment, including:

I. The diagnosis along with the date of onset or exacerbation of the disorder/diagnosis;

   A. A reasonable estimate of when the goals will be reached;
   B. Long-term and short-term goals that are specific, quantitative and objective;
   C. Physical therapy evaluation;
   D. The frequency and duration of treatment; and
   E. The specific treatment techniques and/or exercises to be used in treatment.
II. Signatures of the patient's attending physician and physical therapist.

A. The plan of care should be ongoing, (i.e., updated as the patient's condition changes), and treatment should demonstrate reasonable expectation of improvement (as defined below):

1. Physical therapy services are considered medically necessary only if there is a reasonable expectation that physical therapy will achieve measurable improvement in the patient's condition in a reasonable and predictable period of time.

2. The patient should be reevaluated regularly, and there should be documentation of progress made toward the goals of physical therapy.

The treatment goals and subsequent documentation of treatment results should specifically demonstrate that physical therapy services are contributing to such improvement.

CPT Codes / HCPCS Codes / ICD-9 Codes

CPT codes covered if selection criteria are met:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>97001</td>
<td>Physical therapy evaluation</td>
</tr>
<tr>
<td>97002</td>
<td>Physical Therapy re-evaluation</td>
</tr>
<tr>
<td>97010</td>
<td>Application of a modality to 1 or more areas; hot or cold packs</td>
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<tr>
<td>97012</td>
<td>traction, mechanical</td>
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<tr>
<td>97014</td>
<td>electrical stimulation (unattended)</td>
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<tr>
<td>97016</td>
<td>vasopneumatic devices</td>
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<tr>
<td>97018</td>
<td>paraffin bath</td>
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<tr>
<td>97022</td>
<td>whirlpool</td>
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<tr>
<td>97024</td>
<td>diathermy (eg, microwave)</td>
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<tr>
<td>97026</td>
<td>infrared</td>
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<tr>
<td>97028</td>
<td>ultraviolet</td>
</tr>
<tr>
<td>97032</td>
<td>Application of a modality to one or more areas; electrical stimulation (manual), each 15 minutes</td>
</tr>
<tr>
<td>97033</td>
<td>iontophoresis, each 15 minutes</td>
</tr>
<tr>
<td>97034</td>
<td>contrast baths, each 15 minutes</td>
</tr>
<tr>
<td>97035</td>
<td>ultrasound, each 15 minutes</td>
</tr>
</tbody>
</table>
97036  Hubbard tank, each 15 minutes
97110  Therapeutic procedure, one or more areas, each 15 minutes; therapeutic exercises to develop strength and endurance, range of motion and flexibility
97112  neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and/or proprioception for sitting and/or standing activities
97113  aquatic therapy with therapeutic exercise
97116  gait training (includes stair climbing)
97124  massage, including effleurage, petrissage and/or tapotement (stroking, compression, percussion)
97140  Manual therapy techniques (e.g., mobilization/manipulation, manual lymphatic drainage, manual traction), one or more regions, each 15 minutes
97530  Therapeutic activities, direct (one-on-one) patient contact (use of dynamic activities to improve functional performance), each 15 minutes
97532  Development of cognitive skills to improve attention, memory, problem solving (includes compensatory training), direct (one-on-one) patient contact, each 15 minutes
97535  Self care/home management training (e.g., activities of daily living [ADL] and compensatory training, meal preparation, safety procedures, and instructions in use of assistive technology devices/adaptive equipment) direct one-on-one contact by provider, each 15 minutes
97537  Community/work reintegration training (e.g., shopping, transportation, money management, avocational activities and/or work environment/modification analysis, work task analysis, use of assistive technology device/adaptive equipment), direct one-on-one contact by provider, each 15 minutes
97542  Wheelchair management (e.g., assessment, fitting, training), each 15 minutes
97760  Orthotic(s) management and training (including assessment and fitting when not otherwise reported), upper extremity(s), lower extremity(s), and/or trunk, each 15 minutes
97761  Prosthetic training, upper and/or lower extremity(s), each 15 minutes
97762  Checkout for orthotic/prosthetic use, established patient, each 15 minutes

99509  Home visit for assistance with activities of daily living and personal care

Other CPT codes related to the CPB:

97039  Unlisted modality (specify type and time if constant attendance)

97139  Unlisted therapeutic procedure (specify)

97150  Therapeutic procedure(s), group (2 or more individuals)

HCPCS codes covered if selection criteria are met:

G0151  Services performed by a qualified physical therapist in the home health or hospice setting, each 15 minutes

G0159  Services performed by a qualified physical therapist, in the home health setting, in the establishment or delivery of a safe and effective therapy maintenance program, each 15 minutes

S9131  Physical therapy; in the home, per diem

Other HCPCS codes related to the CPB:

G0152  Services performed by a qualified occupational therapist in the home health or hospice setting, each 15 minutes

G0153  Services performed by a qualified speech-language pathologist in the home health or hospice setting, each 15 minutes

G0157  Services performed by a qualified physical therapist assistant in the home health or hospice setting, each 15 minutes

S8990  Physical or manipulative therapy performed for maintenance rather than restoration

S9128  Speech therapy, in the home, per diem

S9129  Occupational therapy, in the home, per diem

Other ICD-9 codes related to the CPB:

314.0 - 314.9  Hyperkinetic syndrome of childhood

337.20 -  337.29  Reflex sympathetic dystrophy

348.0 - 348.9  Other conditions of brain

350.1 - 359.9  Disorders of the peripheral nervous system
438.20 - Late effects of cerebrovascular disease, hemiplegia/hemiparesis, monoplegia, and other paralytic syndrome
438.84 Other late effects of cerebrovascular disease, ataxia
440.23 Atherosclerosis of the extremities with ulceration
440.24 Atherosclerosis of the extremities with gangrene
454.0 Varicose veins of lower extremities with ulcer
454.2 Varicose veins of lower extremities with ulcer and inflammation
459.81 Venous (peripheral) insufficiency, unspecified
707.00 - Chronic ulcer of skin
707.9
710.0 - 739.9 Diseases of the musculoskeletal system and connective tissue
781.2 Abnormality of gait
781.3 Lack of coordination
781.4 Transient paralysis of limb
782.3 Edema
784.60 - Other symbolic dysfunction
784.69
800.00 - Injury
959.9
V43.60 - Organ or tissue replaced by other means, joint
V43.69
V43.7 Organ or tissue replaced by other means, limb
V54.81 Aftercare following joint replacement
V57.1 Other physical therapy
V57.81 Orthotic training

**ICD-9 codes not covered for plans that exclude developmental delay:**

314.1 Hyperkinesis with developmental delay
315.0 - 315.9 Specific delays in development
317 - 319 Mental retardation
783.40 Lack of normal physiological development, unspecified
783.42 Delayed milestones
784.61 Alexia and dyslexia
V40.0 Problems with learning
V40.1 Problems with communication (including speech)

**Kinesio taping:**

*There is no specific code for Kinesio taping:*

**Other HCPCS codes related to the CPB:**

A4450 Tape, non-waterproof, per 18 square inches
A4452 Tape, waterproof, per 18 square inches

**ICD-9 codes not covered for indications listed in the CPB:**

355.1 Meralgia paresthesia
728.85 Spasm of muscle [lower extremity spasticity]
840.0 - 848.9 Sprains and strains of joints and adjacent muscles
959.3 Injury of elbow, forearm, and wrist

**The above policy is based on the following references:**

27. Interactive Metronome Inc. Interactive Metronome Home Page. Weston, FL: Interactive Metronome Inc.; 2002. Available at:
42. Sheon RP, Duncombe AM. Rehabilitation program for the low back. UpToDate [online serial]. Waltham, MA: UpToDate; reviewed September 2009.


