Cigna Medical Coverage Policy- Therapy Services
Strapping and Taping

Effective Date: 12/3/2023
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INSTRUCTIONS FOR USE

Cigna / ASH Medical Coverage Policies are intended to provide guidance in interpreting certain standard benefit plans administered by Cigna Companies. Please note, the terms of a customer's particular benefit plan document may differ significantly from the standard benefit plans upon which these Cigna / ASH Medical Coverage Policies are based. In the event of a conflict, a customer's benefit plan document always supersedes the information in the Cigna / ASH Medical Coverage Policy. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Determinations in each specific instance may require consideration of:

1) the terms of the applicable benefit plan document in effect on the date of service
2) any applicable laws/regulations
3) any relevant collateral source materials including Cigna-ASH Medical Coverage Policies and
4) the specific facts of the particular situation

Where coverage for care or services does not depend on specific circumstances, reimbursement will only be provided if a requested service(s) is submitted in accordance with the relevant guidelines and criteria outlined in this policy, including covered diagnosis and/or procedure code(s) outlined in the Coding Information section of this policy. Reimbursement is not allowed for services when billed for conditions or diagnoses that are not covered under this policy. When billing, providers must use the most appropriate codes as of the effective date of the submission. Claims submitted for services that are not accompanied by covered code(s) under this policy will be denied as not covered.

Cigna / ASH Medical Coverage Policies relate exclusively to the administration of health benefit plans.

Cigna / ASH Medical Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines.

Some information in these Coverage Policies may not apply to all benefit plans administered by Cigna. Certain Cigna Companies and/or lines of business only provide utilization review services to clients and do not make benefit determinations. References to standard benefit plan language and benefit determinations do not apply to those clients.

GUIDELINES

Medically Necessary

Strapping is considered medically necessary for the management of immobilization of a joint and restriction of movement with strapping tape (i.e., rigid, non-elastic or non-stretchy tape) for ANY of the following indications:

- strapping of hand or finger (CPT code 29280) for:
    - fracture of finger
    - dislocation of finger

- strapping/taping of ankle or foot (CPT code 29540) for:
    - acute sprains and strains of ankle and foot

- dislocations of ankle and foot
- fractures of ankle and foot
- tendinitis and synovitis of ankle and foot
- plantar fasciitis
- tarsal tunnel syndrome

- strapping of toes (CPT code 29550) for:
  - fracture of toes
  - dislocation of toes
  - sprains and strains of toes
  - hallux valgus
  - hammer toe

Strapping for any indication not listed above is not covered or reimbursable.

Not Covered or Reimbursable
Strapping is not covered or reimbursable for the following body parts and for any other indications:

- Shoulder (CPT code 29240)
- Chest or thorax (CPT code 29200)
- Hip (CPT code 29520)
- Elbow or wrist (CPT code 29260)
- Knee (CPT code 29530)
- Back (CPT code: 29799)

Experimental, Investigational, Unproven
Elastic therapeutic taping (i.e., Kinesio taping) or rigid therapeutic taping (i.e., McConnell) is considered experimental, investigational, and/or unproven for ANY indication including but not limited to:

- back pain
- radicular pain syndromes
- other back-related conditions
- lower extremity spasticity
- meralgia paresthetica
- post-operative subacromial decompression
- wrist injury
- performance enhancement
- prevention of ankle sprains

Strapping
Strapping is used when the desired effect is to provide immobilization or restriction of movement. Strapping refers to the application of overlapping strips of tape or adhesive plaster to a body part to exert pressure on it and serve as a splint to hold a structure in place and reduce motion. There are many types of tape used for strapping purpose, but in general the tape used for strapping is a rigid, non-elastic or non-stretchy tape. In general, strapping may be used to treat strains, sprains, dislocations, and some fractures. The purpose of strapping is to stabilize or protect a fracture, injury, or dislocation and/or to afford comfort to a patient without a restorative treatment or procedure. Strapping limits ROM and/or restricts muscle movement. Strapping is used for acute injuries or as a result of disease or surgery. The goals and outcomes are stabilization of the injured area, reduced pain, aid recovery, and to provide support so the area heals in the correct position. Strapping services are usually provided outside a therapy plan of care. At times, the term taping is used interchangeably with strapping. However taping that is not used to provide immobilization or restriction of movement or is used as part of a therapy program is not considered strapping. If the purpose of the taping is to immobilize a joint, then the strapping codes are appropriate as these codes describe the use of a strap or other reinforced material applied post-fracture (or other injury) to immobilize the joint. Strapping materials are rigid and non-elastic. They are usually highly adhesive. Often pre-wrap is required prior to application. Premade splints are not strapping materials.

Strapping is not synonymous with therapeutic taping when considering methods such as McConnell taping or elastic therapeutic taping (e.g., Kinesio tape, Spidertech tape). These types of taping are used in conjunction with provision of skilled therapeutic exercises, functional training, gait training, manual therapy, or neuromuscular re-education (NMR) techniques and would be considered part of the exercise or NMR or other procedure. Indications include orthopedic and neurologic conditions. Proposed benefits include but are not limited to improved feedback and timing of muscle activation, reduced pain, reduced swelling and improved circulation.

Strapping can be performed as an initial treatment or as a replacement service during or after follow-up care. Strapping may also refer to taping for prevention of injury or re-injury to support a joint with ligamentous instability. An adhesive zinc oxide based tape is used that is stiff in nature and not elastic. As an example, the proposed mechanism of strapping/taping of the ankle joint is to limit physiological range of motion (ROM) and control talar tilt. It is also suggested that adhesive strapping/taping can act as a secondary ligament based on tape alignment and application in a way that prevents extremes of motion. This is also similar to low dye taping for plantar fasciitis. Low dye taping assists the soft tissues in support of the longitudinal arch of the foot to reduce stress on the plantar fascia. The combination of the body tissues and strapping/taping improves the capacity to dissipate the energy associated with potentially traumatic forces. It is also believed that the strapping/taping stimulates the skin receptors which facilitates muscle contraction.

Elastic Therapeutic Taping (e.g., Kinesio™ tape, Spidertech™ tape)
Elastic therapeutic tape 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 is theorized that it 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 (Halseth, et al., 2004). This specialized taping, also referred to as kinesio taping (KT), is utilized as part of a rehabilitation program, and is not used for acute injury or to immobilize a body part. This type of taping is generally provided in therapy by chiropractors, physical therapists and occupational therapists in a therapy program. The application of the tape is included in the time spent in direct contact with the patient to provide either re-education of a muscle and movement, or to stabilize one body area to enable improved strength or range of motion. The application of tape may be performed in combination with education of the patient on various functional movement patterns and with therapeutic exercise, gait training, neurological re-education and manual therapy in the treatment of orthopedic, neuromuscular or neurological conditions. Generally the tape will be left in place after instruction related to movements. Taping provided during a therapy program should be included in the therapeutic modality that is being provided and should not be billed separately.

The tape is available in various lengths or pre-cut. There are several types of elastic therapeutic tape available including:

- Kinesio™ tape (Kinesio Taping, LLC. Albuquerque, NM)
- SpiderTech™ tape (SpiderTech Inc., Toronto, Ontario)
- KT TAPE/KT TAPE PRO™ (LUMOS INC., Lindon, UT)

Use of elastic therapeutic taping purportedly acts to prolong the benefits of manual therapy administered in the clinical setting. A second technique is used to lift the skin over an area of inflammation, thereby increasing the interstitial space, promoting circulation and lymphatic drainage in an effort to reduce swelling, pressure and pain. It is generally related to the following diagnoses:

- Bruising
- Edema and swelling
- Repetitive strains/sprains
- Pain due to arthritis
- Trauma or chronic pain syndrome
- Rotator cuff injuries
- Plantar fasciitis
- Weakness resulting in postural and biomechanical imbalances
- Restricted range of motion and joints not tracking properly

The expected benefits of treatment include:

- Improved feedback and timing of muscle activation in controlling joint stability during functional exercises
- Stimulation of optimal muscle activation and strength
- Lessened irritation of subcutaneous neural pain receptors
- Reduced swelling, improved circulation
- Enhanced functional stability and mobility
- Support of weakened and strained muscles

Elastic tape is applied in a specific manner relying on the origin and insertion of the muscle. Per course education, it can be applied in different directions, and with differing amounts of stretch; which (hypothetically) determines its ability to re-educate the neuromuscular system, reduce inflammation and pain, promote circulation and healing, prevent injury and enhance performance. It should always be used in conjunction with other treatment interventions during the acute rehabilitation and chronic phase of treatment. The wear time is 3-4 days according to KT course education.

As mentioned previously, elastic therapeutic tape is used while providing skilled therapeutic exercises, manual therapy, or NMR techniques in the treatment of sports injuries and a variety of other disorders. Dr. Kenso Kase, a chiropractor, developed Kinesio taping (KT) techniques in the 1970s. It is claimed that elastic therapeutic tape supports injured muscles and joints and helps relieve pain by lifting the skin and allowing improved blood and lymph flow. Opening up this area is also thought to relieve pressure on nerve endings that send pain messages to the brain. Additionally, the tape is thought to stretch the fascial tissue for extended periods of time which is claimed to be beneficial; this is thought to also reduce muscle spasms. Elastic therapeutic tape users also propose that with muscle application, which is common in athletic settings, application of tape for a line of pull from origin to insertion will enhance or facilitate muscle activity, and taping from insertion to origin will inhibit or relax muscle based on Golgi tendon organ (GTO) actions. From a proprioceptive standpoint, it is theorized that placing it over a tendon or ligament will amplify signals to the brain regarding the amount of tension over that particular area. In this way, it stimulates the GTO and helps the brain perceive and react to the support. Other stated proposed uses of the tape are for functional corrections. The tape would be applied to muscles and joints that are flexed and the tape is then used to ‘preload’ or assist the joint through its range of motion (ROM). Proponents postulate that in this shortened position more information is passed through the neural network and muscle contractions are supported or assisted. At this time these are all theoretical in nature.

Rigid Therapeutic Taping (i.e. McConnell Taping)
Rigid taping methods to illicit positional changes include McConnell taping, which uses Leukotape applied over Cover-roll tape to change joint mechanics through positional changes of boney and/or soft tissue structures as part of a comprehensive rehabilitation program. Jenny McConnell has pioneered its use. McConnell taping began with the patellofemoral joint and is now being utilized for other joints in the body, such as the hip and shoulder joints. For the patellofemoral joint, the physical correction of malalignment is just one reason why patella taping is thought to be effective for Patellofemoral Pain Syndrome (PFPS). As the patella is more correctly positioned within the trochlear groove, tracking during flexion and extension of the knee is normalized. Theoretically, with this repositioning, the vastus medialis oblique (VMO) function may also be enhanced. Similar principles exist for the other joints with regard to correcting position of the head of the humerus and scapula. Taping for the hip joint, with its surrounding soft tissue thickness, primarily focuses on muscle length changes. The neuromuscular reeducation CPT code is used with this type of rigid taping. Additionally, this form of taping is not used for immobilization of joints (e.g., wrist, hand, elbow, ankle, and knee due to severe sprain/strain or in some cases, fracture) and does not use overlapping straps.

The following uses of therapeutic taping are professionally recognized and safe; however, additional studies are needed before the clinical effectiveness can be established. Use of elastic or rigid taping techniques as part of comprehensive treatment program may be clinically appropriate for the following:

- Rigid therapeutic taping for pain reduction in patellofemoral pain syndrome;
- Rigid therapeutic taping of the shoulder in patients with hemiplegia

The use of rigid taping or elastic taping for rehabilitation of orthopedic or neurologic conditions is not intended as a sole treatment or as a separately billable procedure, but rather is part of a broad treatment program that includes exercise, manual therapy and/or neuromuscular re-education (NMR) and is inclusive in these procedures. Strapping codes are not allowed for application of therapeutic taping.

DOCUMENTATION GUIDELINES

“Medically necessary” or “medical necessity” shall mean health care services that a healthcare practitioner/provider, exercising prudent clinical judgment, would provide to a patient for the purpose of evaluating, diagnosing, or treating an illness, injury, disease or its symptoms, and that are (a) in accordance with generally accepted standards of medical practice; (b) clinically appropriate in terms of type, frequency, extent, site, and duration; and considered effective for the patient’s illness, injury, or disease; and (c) not primarily for the convenience of the patient or healthcare provider, and not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of that patient’s illness, injury, or disease. The patient’s medical records should document the practitioner’s clinical rationale for performing the specific strapping or taping procedures, as well as, the patient’s response.

Any time taping is done; the health care record must clearly document the specific reasons for, and location of, the taping. If the service that includes the taping is billed to a payor, the taping must be consistent with the documented chief complaint / clinical examination findings, diagnosis and treatment plan. The assessment will support the medical necessity and is often established through the history and objective evaluation. After medical necessity is established, a treatment plan with goals and objective measures, including time frames, is documented.

According to the AMA CPT Assistant, if Kinesio taping is performed to facilitate movement by providing support, and the tape is applied specifically to enable less painful use of the joint and greater function, (restricting in some movement, facilitating in others), application of the tape in this manner is typically part of neuromuscular re-education (97112) or therapeutic exercises (97110), depending on the intent and the outcome desired. In these cases, the application of the tape would be included in the time spent in direct contact with the patient and would not be appropriately billed using strapping codes.

LITERATURE REVIEW

Strapping of the Hand, Finger or Toes

Injuries of the fingers or the toes, such as certain fractures, sprains, strains or dislocations are common injuries in the United States (U.S.). Treatment frequently includes protected mobilization and treatment of presenting symptoms such as pain and swelling. Both immobilization and protected mobilization support soft tissue healing while protecting against further injury. With protected mobilization some movement is allowed so that stiffness can be prevented and range of motion maintained to some degree. Strapping, in the form of buddy, neighbor, or functional taping, is one method of providing protected mobilization (Basset, et al. 2016; Joshi, et al., 2016; Boutis, 2016). With this method, the healthy digit acts as a splint, keeping the injured one in a natural position for healing. It is a known method for treating sprains, dislocations, and other injuries of fingers or toes and is considered a standard of care (Won, et al., 2014). Buddy taping is a standard intervention for the treatment of both non-displaced fractures and displaced fractures following reduction (Hatch, 2003; Jones, 2012; Nellans, 2013). Buddy taping of the fractured toe to an adjacent stable toe usually provides satisfactory alignment and relief of symptoms (Wells, et al., 2016)

Multiple studies support that the use of strapping for achieving results similar or better than splinting or other forms of immobilization (Braakman, 1998; Chalmer, 2013; Park, 2015; Paschos, 2014; Poolman, 2005; van Aaken, 2007). Conservative or non-surgical treatment generally involves fracture reduction, where the bone fragments are put back into place, followed by immobilization by various means (e.g., plaster cast, splint, brace or strapping of adjacent fingers). Although the published evidence is not strong, a Cochrane review compared functional treatment with immobilization, and to compare different periods and types of immobilization including functional taping, for the treatment of closed fifth metacarpal neck fractures in adults did note that no single non-operative treatment regimen for this fracture can be recommended as superior to another. The review did note that recovery was generally excellent whichever method of treatment was used (Poolman, et al., 2009). Based on textbooks and published evidence strapping of fingers and toes for fractures, dislocations, sprains and strains is considered medically necessary and standard of care.

In addition to injuries, strapping is commonly used as an alternative or adjunctive postoperative treatment to surgery for deformities. For example, strapping may be used to facilitate realignment in minor nonsurgical cases of hammertoe or hallux valgus, or to maintain correct position during postoperative healing. American College of Foot and Ankle Surgeons (ACFAS) published a clinical consensus statement for digital deformities (hammer toe). Initial treatment options include padding, debridement of hyperkeratoci lesions, corticosteroid injections, taping and footwear changes (Clinical Practice Guideline Forefoot Disorders Panel, et al., 2009d). Hallux valgus is the lateral deviation of the great toe towards the midline of the foot. It is usually accompanied by a bunion, which is the inflammation and thickening of the first metatarsal joint of the great toe. The terms bunion and hallux valgus are often used interchangeably. The medial eminence, or bunion, is often the most visible component of a hallux valgus deformity. Nonsurgical care is considered the first option for a patient with this deformity and is typically attempted prior to considering surgical intervention. Initial treatment is often self-directed and may include: wider, lower-heeled shoes, bunion pads, ice, over-the-counter analgesics, and non-steroidal anti-inflammatory medications (NSAIDs). Metatarsal pads, foot orthoses or taping of the hallux may be utilized. Local anesthetic and steroid injection into the first metatarsophalangeal (MTP) joint may provide short-term pain relief, but is not considered to be curative (Frontera, et al., 2014; Hecht, et al., 2014, Canale, et al., 2013).

Hammer toe is the term often used to denote any toe with a dorsal contracture. While hammer toe is the most common of the lesser toe deformities (i.e., toes 2–5), it is one of several conditions that are included in this group. A hammer toe deformity, which is a flexion contracture of the proximal interphalangeal joint, may also include an extensor contracture of the metatarsophalangeal joint. The deformity may be either fixed and rigid or flexible in which case it is passively correctable to the neutral position. This is the most common of the lesser toe deformities. A hallux valgus deformity can be a factor in development of hammer toe by placing pressure on the second toe. A claw toe is an extension contracture of the metatarsophalangeal joint and flexion contracture of the proximal interphalangeal joint, with additional flexion contraction of the distal interphalangeal joint. This condition is frequently caused by neuromuscular diseases and is often present in all toes. A mallet toe is a single flexion contraction at the distal interphalangeal joint, with pressure being placed on the tip of the toe. This deformity occurs less frequently than a hammer toe deformity. A fixed hammer toe deformity of the fifth toe can include a cock-up deformity, which includes dorsiflexion of the metatarsophalangeal joint and flexion of the interphalangeal and distal interphalangeal joint. Initial treatment is conservative in nature, often self-directed and may include: wider, lower-heeled shoes; bunion pads; ice; over-the-counter analgesics and nonsteroidal anti-inflammatory medications (NSAIDs). Conservative treatment may also include debridement, padding, anti-inflammatory injections, steroid injections, and foot orthoses (Frontera, et al., 2014; Canale, et al., 2013).

American College of Foot and Ankle Surgeons (ACFAS) published a clinical consensus statement for digital deformities (hammer toe). Initial treatment options include padding, debridement of hyperkeratoci lesions, corticosteroid injections, taping and footwear changes (Clinical Practice Guideline Forefoot Disorders Panel, et al., 2009d). Based on medical textbooks strapping of toes may be used for fractures, dislocation, sprains, strains, hallux valgus, and hammer toe deformities.

Strapping/Taping of the Foot or Ankle

Strapping of ankle and/or foot may be used in treatment of acute severe strains and sprains of the ankle. Sprains range in severity from mild stretching of ligamentous fibers (first degree) to a tear of some portion of the ligament (second degree) to complete ligamentous separation (third degree), sometimes with avulsion of small bony fragments. Sprain usually occurs when excessive inversion or eversion stress is applied to the ankle while it is in the relatively unstable plantar-flexed position. Rest, ice, compression and elevation (RICE) therapy is often recommended for the first 24 to 48 hours following injury. Additional treatment options range from complete immobilization with casting to no supportive devices. Functional treatment or partial immobilization with strapping allows for some movement to maintain range of motion while providing some support. Taping/strapping of the ankle may be used in treatment of ankle sprains. The purpose of taping the ankle is to prevent further stretching of the injured ligaments until healing has occurred (Chiodo, et al., 2009; Canale, et al., 2013). During functional rehabilitation, it may be of benefit to use splints, braces, elastic bandages, or taping to try to reduce instability, protect the ankle from further injury, and to limit swelling (Maughan, 2015). The 2013 American Physical Therapy Association (APTA) Clinical Practice Guidelines on Ankle Ligament Sprains recommends individuals use some type of external support, including strapping/taping, in the acute phase along with progressive weight-bearing. The type of support should be based upon the severity of the injury. There is some debate regarding the best treatment for ankle injuries, however strapping remains a standard of care as a functional treatment option. Functional treatment allows individuals to ambulate and quickly regain function and restore flexibility and strength as compared to complete immobilization with casting (Ardèvol, 2002; Kannus, 1991; Seah, 2010; Sommer, 1989).

Seah and Mani-Babu (2011) presented a systematic review of the management of ankle sprains. Findings suggest that for mild to moderate ankle sprains, treatment options such as elastic bandaging, soft casting, or taping or orthoses with coordination training were found to be statistically significantly better than immobilization for many outcome measures. For severe ankle sprains, a short period of immobilization with a pneumatic brace resulted in quicker recovery than with a compression bandage alone. Lace up braces were found to be more effective than elastic bandaging and help to reduce swelling in the short term better than when using a semi-rigid support, elastic bandaging, and tape. Lardenoye et al. (2012) studied the effect of taping vs. semi-rigid bracing (such as an Aircast) on outcomes and satisfaction in patients with ankle sprains. One hundred (100) patients identified via the emergency room with grade II and III ankle sprains were randomized into two (2) groups. Prior to randomization, patients received standard ER care of rest, ice, compression and elevation. After five to seven (5-7) days from the ER visit, for four (4) weeks one group received ankle taping for support (standard overlapping strips, basket weave) and the other group received a semi-rigid ankle brace. Both groups also received standardized physical and proprioceptive training. Patients reported significantly greater comfort and satisfaction with the semi-rigid brace over taping. Functional outcomes and pain were similar between groups. Kaminski et al. in coordination with the National Athletic Trainers' Association (2013) created a position statement on the conservative management of prevention of ankle sprains in athletes. The purpose of the position statement was to present recommendations for athletic trainers and other allied health care professionals to manage and/or prevent ankle sprains. Considerations for appropriate preventive measures (including taping and bracing), initial assessment, long and short term management strategies, return to play guidelines, recommendations for syndesmotic ankle sprains and chronic ankle instability. Recommendations included that athletes with a history of previous ankle sprains should wear prophylactic ankle supports in the form of ankle taping or bracing for all practices and games. Both lace-up and semi-rigid ankle braces and traditional ankle taping are effective in reducing the rate of recurrent ankle sprains in athletes (Grade B evidence). Clinical practice guidelines from the American Physical Therapy Association (APTA) for ankle ligament sprain includes taping/strapping as a method of providing external support (Martin, et al., 2013). (Level II: Evidence obtained from lesser-quality diagnostic studies, prospective studies, or randomized controlled trials (e.g., weaker diagnostic criteria and reference standards, improper randomization, no blinding, less than 80% follow-up). Based on clinical practice guidelines and medical textbooks, strapping of the foot and ankle is considered a standard of care and medically necessary for acute severe strains and sprains of the ankle, fracture of foot and ankle, and dislocations of ankle and foot.

Due to the ability of strapping to temporarily support and restrict movement, it may be used for other types of foot or ankle injuries such as plantar fasciitis or tendinitis, or post-operatively. Plantar fasciitis describes the local inflammation and subsequent pain occurring at the insertion at the heel or along the course of the fascial band as it connects the heel to the toe (Ferri, 2015). Plantar fasciitis is a common cause of heel pain in adults. Symptoms usually start gradually with mild pain at the heel, pain after exercise and pain with standing first thing in the morning. Conservative treatment may provide relief from the pain. Conservative treatment may include tape support of the affected plantar surface, a technique referred to as low-Dye taping (Buchbinder, 2016; Goff, et al., 2011). Four strips of tape are applied in a specific fashion to provide support. Podolsky et al. (2015) reported on a systematic review regarding the efficacy of different taping techniques in relieving symptoms and dysfunction caused by plantar fasciitis. Five randomized control trials, one cross-over study and two single group repeated measures studies met the inclusion criteria. Two studies were high quality; two were moderate quality and four were of poor methodological quality. All eight studies favored the use of different taping techniques, with the most common technique being low dye taping. The author noted that all studies investigated the short-term effect of taping, with the longest follow-up of only one week. The study noted that additional studies are essential in order to investigate the long-term effect of taping. Low-dye taping and calcaneal taping were found to have the best evidence in this review. The results suggest that taping is a beneficial technique for plantar fasciitis in short-term treatment.

Van de Water et al. (2010) reported on a systematic review that assessed efficacy of a taping construction as an intervention or as part of an intervention in patients with plantar fasciosis (plantar fasciitis) on pain and disability. The review included five controlled trials with three trials found to have high methodological quality and had clinical relevance. The findings indicated strong evidence of pain improvement at one-week follow-up, inconclusive results for change in level of disability in the short term, and that the addition of taping on stretching exercises has a surplus value. Landorf et al. (2008) reported on a systematic review of treatments of plantar fasciitis. The review found based on two randomized controlled studies that for pain relief compared with no taping/no treatment Low-dye taping is more effective than no taping at one week at reducing first step pain, and calcaneal taping is more effective than sham taping at improving pain at one week (moderate-quality evidence*) and categorized as likely to be beneficial. *Moderate-quality evidence: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate. Radford et al. (2006) conducted a randomized controlled trial to assess effectiveness of low-Dye taping for plantar heel pain. The trial included 92 participants who were randomized to low-dye taping and sham ultrasound or sham ultrasound alone with duration of one week. Outcome measures included 'first-step' pain that was measured on a 100 mm Visual Analogue Scale and Foot Health Status Questionnaire domains of foot pain, foot function and general foot health. The results indicated that participants treated with low-Dye taping reported a small improvement in 'first-step' pain after one week of treatment compared to those who did not receive taping. The estimate of effect on 'first-step' pain favored the low-Dye tape (ANCOVA adjusted mean difference - 12.3 mm; 95% CI -22.4 to -2.2;P=0.017). There were no other statistically significant differences between groups. Limitations of the study include that it was short-term, and that it included one type of taping for heel pain. Clinical practice guidelines from the American Physical Therapy Association (APTA) for heel pain and plantar fasciitis include strapping as a treatment for this condition. The guidelines include the a recommendation that clinicians should use antipronation taping for immediate (up to three weeks) pain reduction and improved function for individuals with heel pain/plantar fasciitis (Martin, et al., 2014). American College of Foot and Ankle Surgeons (ACFAS) published a clinical consensus statement for diagnosis and treatment of heel pain (Thomas, et al., 2010). These guidelines include taping/strapping as an initial treatment of plantar heel pain, including plantar fasciitis. In addition, they note that if improvement is noted, the initial therapy program is continued until symptoms are resolved.

Morrissey et al. (2021) developed a best practice guide for managing people with plantar heel pain (PHP). Randomised controlled trials (RCTs) evaluating any intervention for people with PHP in any language were included subject to strict quality criteria. Trials with a sample size greater than n=38 were considered for proof of efficacy. International experts were interviewed using a semi-structured approach and people with PHP were surveyed online. Fifty-one eligible trials enrolled 4351 participants, with 9 RCTs suitable to determine proof of efficacy for 10 interventions. Forty people with PHP completed the online survey and 14 experts were interviewed resulting in 7 themes and 38 subthemes. There was good agreement between the systematic review findings and interview data about taping and plantar fascia stretching for first step pain in the short term. Clinical reasoning advocated combining these interventions with education and footwear advice as the core self-management approach. There was good expert agreement with systematic review findings recommending stepped care management with focused shockwave for first step pain in the short-term, medium-term and long-term and radial shockwave for first step pain in the short term and long term. We found good agreement to 'step care' using custom foot orthoses for general pain in the short term and medium term. Authors concluded that best practice from a mixed-methods study synthesising systematic review with expert opinion and patient feedback suggests core treatment for people with PHP should include taping, stretching and individualised education. Patients who do not optimally improve may be offered shockwave therapy, followed by custom orthoses.

Other musculoskeletal conditions of the foot and ankle may be treated with conservative treatment that includes strapping and taping to immobilize the area and treat the pain. These include tendinitis, also referred to as tendinopathy, and synovitis (Biundo, 2012; Chiodo, et al., 2009; Simpson, et al., 2009). Hyland et al. (2006) conducted a prospective, randomized study to examine the effects of a calcaneal and Achilles-tendon–taping technique, utilizing only 4 pieces of tape and not involving the medial arch, on the symptoms of plantar heel pain. The study included 41 patients who were appointed to one of four groups: stretching of the plantar fascia; calcaneal taping; control (no treatment); and sham taping. A visual analog scale (VAS) for pain and a patient-specific functional scale (PSFS) for functional activities were measured pretreatment and after 1 week of treatment. Results indicated a significant difference in post-treatment among the groups for the VAS (P<.001). Specifically, significant differences were found between stretching and calcaneal taping (mean ±SD, 4.6 ± 0.7 versus 2.7 ± 1.8; P=.006), stretching and control (mean ± SD, 4.6 ± 0.7 versus 6.2 ± 1.0; P=.026), calcaneal taping and control (mean ± SD, 2.7 ± 1.8 versus 6.2 ± 1.0; P<.001), and calcaneal taping and sham taping (mean ± SD, 2.7 ± 1.8 versus 6.0 ± 0.9; P<.001). No significant difference among groups was found for post-treatment PSFS (P=.078). Calcaneal taping was demonstrated to be a more effective tool for the relief of plantar heel pain than stretching, sham taping, or no treatment. Limitations of the study included the small sample size and the short duration. Clinical practice guidelines from the American Physical Therapy Association (APTA) for Achilles tendinopathy include the recommendation that taping may be used in an attempt to decrease strain on the Achilles tendon in patients with Achilles tendinopathy (Recommendation based on expert opinion.) (Carcia, et al., 2010).

Tarsal tunnel syndrome refers to tibial nerve compression in the region of the ankles as the nerve passes under the transverse tarsal ligament (Rutkove, 2016; Campbell. et al., 2008; Scherer, 2004). Beneath this there is a tunnel containing the tendons of the flexor digitorum longus and flexor hallucis longus muscles, the vascular bundle, the posterior tibial nerve, and the medial and lateral plantar nerves. A frequent cause of tarsal tunnel syndrome is a fracture or dislocation involving the talus, calcaneus, or medial malleolus. In these cases, scar tissue, bone or cartilage fragments, or bony spurs may be found compressing the nerve. Patients with tarsal tunnel syndrome typically present with aching, burning, numbness, and tingling involving the sole of the foot, the distal foot, the toes, and occasionally the heel. Treatment may include a trial of conservative therapy, including nonsteroidal anti-inflammatory drugs (NSAIDs), shoe modification, taping and orthotics. If the patient does not respond, corticosteroid injection may be used. When patient does not respond to conservative treatment, surgery, decompression of tibial nerve, may be necessary.

Based on clinical practice guidelines and medical textbooks strapping of the foot and ankle is considered a standard of care and medically necessary for acute severe strains and sprains of the ankle, fracture of foot and ankle, dislocations of ankle and foot, tendinitis and synovitis of ankle and foot, plantar fasciitis, tarsal tunnel syndrome.

Strapping of the Thorax

There no evidence supporting the use of chest or thorax strapping for any conditions, including back or neck pain. Chest wall strapping results in breathing in lower lung volumes and mimics the effects of restrictive lung diseases. While chest strapping can limit pain associated with fractured ribs, the risk of adverse pulmonary outcomes and alternative treatments for pain recommend against chest immobilization (Lazcano, 1989; Quick, 1990). There does not appear to be a role for the use of taping/strapping of the chest or thorax, including fractured ribs. Once significant associated injuries have been evaluated and treated, the cornerstone of rib fracture management is pain control. Early and adequate pain relief is essential to avoid complications from splinting and atelectasis, primarily pneumonia. For isolated injuries (i.e., single rib fracture), clinicians generally begin treatment with nonsteroidal anti-inflammatory drugs (NSAIDs) with or without opioids. For more severe injuries, particularly if ventilation is compromised, admission and invasive treatments, such as intercostal nerve blocks, may be needed (Karlson, 2015). An ideal method of managing pain in patients with multiple fractured ribs is one that is safe and simple, provides complete and prolonged analgesia, permits deep breathing and clearance of secretions, and allows cooperation during chest physiotherapy (Karmaker, et al., 2003).

There is insufficient evidence in the published medical literature that demonstrates the efficacy of strapping of chest or thorax for any indication, including but not limited to back pain, neck pain or fractured ribs.

Strapping for Other Conditions

There is no clinical evidence in the form of published medical literature or clinical practice guidelines which support the use of strapping the elbow, wrist, shoulder, hip or knee. In addition, there is no indication that strapping is a standard of care for any conditions in these areas.

Strapping of Shoulder

Acute anterior shoulder dislocation is an injury in which the top end of the upper arm bone is pushed out of the joint socket in a forward direction. Afterwards, the shoulder is less stable and is prone to re-dislocation or subluxation (Hanchard, et al., 2015). Initial treatment involves closed reduction or placing the joint back in place. Treatment is often conservative and generally involves placement of the injured arm in a sling or in another immobilizing device followed by specific exercises. Most fractures or the clavicle are treated closed. Treatment includes immobilization with either a sling, figure of eight bandage, or commercially available immobilizer for several weeks (Canale, et al., 2013; Hatch, 2015, Sherman, 2015). Strapping/taping does not appear to have a role in shoulder or clavicle fractures. There is insufficient evidence in the published medical literature that demonstrates the efficacy of strapping of the shoulder for any indication.

Strapping of Elbow or Wrist

Elbow dislocations are treated with reduction of the dislocation, and then may be followed by immobilization with cast and/or sling. Severe cases may require surgery (Hackl, et al., 2015; Murphy, et al., 2016). The use of strapping or taping does not have a role in the treatment of elbow dislocations.

There is insufficient evidence in the published medical literature that demonstrates the efficacy of strapping of elbow or wrist for any indication.

Strapping of Hip
Treatment of hip fracture in children includes reduction (either open or closed), stable internal fixation and spica casting (Wells, et al., 2016). Congenital dysplasia of the hip generally includes subluxation or partial dislocation of the femoral head, acetabular dysplasia, and complete dislocation of the femoral head from the true acetabulum. Congenital dysplasia of the hip or DDH is age related and tailored to the specific pathological condition and may include stabilizing the hip, open or closed reduction and use of bracing or casting (Canale, et al., 2013; Clarke , et al., 2012; Schwend, et al., 2014). Strapping of the hip does not appear to have a role or to be a standard of care for conditions of the hip.

There is insufficient evidence in the published medical literature that demonstrates the efficacy of strapping of the hip for any indication.

Strapping of Knee
Most uses of tape are as part of a therapy program and not for immobilization purposes. There is insufficient evidence in the published medical literature that demonstrates the efficacy of strapping of the knee for any indication.

Strapping of Back
There is insufficient evidence in the published medical literature that demonstrates the efficacy of strapping of the back for any indication.

<u>Elastic Therapeutic Taping</u>

<u>Rehabilitation of Orthopedic Conditions</u>
Halseth et al. (2004) examined if KT on the anterior and lateral portion of the ankle would enhance ankle proprioception compared to the untaped ankle. A total of thirty (30) subjects (15 men, 15 women, ages 18 to 30 years) participated in this study. The results indicated no significant differences in either absolute or constant error between the no-tape and Kinesio taped conditions in either plantar flexion or inversion with twenty (20) degrees of plantar flexion. This indicated that KT likely does not enhance proprioception when measured by active ankle reproduction joint position sense (RJPS) in healthy subjects. The hypothesis that ankle taping would decrease absolute error and constant error of reproduction joint position sense was not supported by the data. The authors stated that in order to fully understand the effect of KT on proprioception, further research needs to be conducted on other joints, on the method of application of KT, and the health of the subject to whom it is applied. In addition, further research may provide vital information about a possible benefit of KT during the acute and sub-acute phases of rehabilitation, thus facilitating earlier return to activity participation. Freedman et al. (2014) researched whether patellar KT would improve short term pain and single-leg hop measures in patients with patellofemoral pain syndrome (PFPS) when compared to sham KT. 49 subjects (mostly female) between the ages of 12 and 24 received both experimental and sham taping while completing 4 functional tasks and the single leg hop test. Separate paired t-tests found improvement in pain with the step up, step down and single leg hop test between taping conditions. A main effect for taping condition was determined through a 2 factor ANOVA. There was also an interaction between taping condition and side. Subjects demonstrated significantly greater hop distances for the experimental KT application vs. the sham application for the side with PFPS. Authors concluded that patellar KT provided an immediate and significant improvement in pain levels and single leg hop distance in patients with PFPS. Gaitonde et al. (2019) authored a summary on patellofemoral pain syndrome. In their review of the literature, they noted that treatment of PFPS includes rest, a short course of nonsteroidal anti-inflammatory drugs, and physical therapy directed at strengthening the hip flexor, trunk, and knee muscle groups. Regarding elastic taping, authors concluded that patellar kinesiotaping may provide additional short-term pain relief; however, evidence is insufficient to support its routine use.

Lee et al. (2016) examined the effects of kinesiology taping therapy on degenerative knee arthritis patients' pain, function, and joint range of motion. The review included 30 patients with degenerative knee arthritis who were divided into two groups: conservative treatment group (CTG, n=15) and the kinesiology taping group (KTG, n=15) and received treatment three times per week for four weeks. In intragroup comparisons of the kinesiology taping group and the CTG, the visual analog scale and Korean Western Ontario and McMaster Universities Osteoarthritis Index scores significantly decreased, and the range of motion increased more than significantly. In intergroup comparisons, the kinesiology taping group showed significantly lower visual analog scale and Korean Western Ontario and McMaster Universities Osteoarthritis Index scores and significantly larger ranges of motion than the conservative treatment group. The study is limited by the small number of participants and short study period. The authors concluded that kinesiology taping therapy may be considered an effective nonsurgical intervention method for pain relief, daily living activities, and range of motion of degenerative knee arthritis patients. Further studies that contain larger number of participants and review for a longer period of time are needed to validate these results. The American Academy of Orthopaedic Surgeons (AAOS) published clinical practice guidelines for the treatment of osteoarthritis of the knee (AAOS, 2013). The guidelines do not include taping for treatment of this condition. Li et al. (2018) investigated outcomes including self-reported pain, knee flexibility, knee-related health status, adverse events, muscle strength, and proprioceptive sensibility. Eleven randomized controlled trials (RCTs) with 168 participants with knee OA provided data for the meta-analysis. The overall quality of evidence was from moderate to very low. Authors concluded that there was weak evidence to suggest that elastic taping was effective in the treatment of knee OA due to lack power and poor design.

Ye et al. (2020) assessed the effects of elastic taping on pain, physical function, range of motion, and muscle strength in patients with knee osteoarthritis. Eleven randomized controlled trials involving 490 patients with knee osteoarthritis were included. A statistically significant difference was detected in physical function, range of motion, and quadriceps muscle strength. No significant differences were found for the hamstring muscle strength. Authors concluded that elastic taping has significant effects on pain, physical function, range of motion, and quadriceps muscle strength in patients with knee osteoarthritis. However, the current evidence is insufficient to draw conclusions on the effects of elastic taping combined with other physiotherapy for knee osteoarthritis. Further studies are needed to investigate the long-term effects of elastic taping combined with other physiotherapy compared with elastic taping alone for knee osteoarthritis. Pinheiro et al. (2020) analyzed the current evidence about the effects of kinesiology taping (KT) with different amounts of tension in people with knee osteoarthritis (OA). They included clinical trials that compared the application of KT with and without tension in people with knee OA. Of the 850 studies identified, eight met the inclusion criteria and were ultimately included in this review. Most studies had moderate quality, with a satisfactory PEDro score. Results showed that KT application with tension was not superior to the application without tension for the outcomes of pain, physical function, range of motion and muscle strength. Evidence for edema, balance and quality of life is still limited. Authors concluded that the current evidence does not support the use of kinesiology taping in people with knee OA. Kolasinski et al. (2020) developed an evidence-based guideline for the comprehensive management of osteoarthritis (OA) as a collaboration between the American College of Rheumatology (ACR) and the Arthritis Foundation, updating the 2012 ACR recommendations for the management of hand, hip, and knee OA. Based on the available evidence, either strong or conditional recommendations were made for or against the approaches evaluated. Conditional recommendations were made for kinesiotaping for first CMC OA.

Danazumi et al. (2020) examined the effect of Kinesio taping as an adjunct to combined chain exercises compared with combined chain exercises alone in the management of individuals with knee osteoarthritis. A total of 60 (27 male, 33 female) individuals (age range = 50-71 yrs and mean age = 54.26 ± 8.83 yrs) diagnosed as having mild to moderate knee osteoarthritis (based on the Kellgren and Lawrence grade I-III classification) were randomly allocated into two groups with 30 participants each in the Kinesio taping + combined chain exercises and combined chain exercises groups. Participants in the Kinesio taping + combined chain exercises group received Kinesio taping plus combined chain exercises and those in the combined chain exercises group received only combined chain exercises. Each participant was assessed for pain, range of motion, functional mobility, and quality of life at baseline and after 8 wks of intervention. A mixed-design multivariate analysis of variance was used to analyze the treatment effect. No significant differences were observed in the baseline characteristics of participants in both groups. The result indicated that there was a significant time effect for all outcomes, with a significant interaction between time and intervention. The Bonferroni post hoc analyses of time and intervention effects indicated that the Kinesio taping + combined chain exercises group improved significantly better than the combined chain exercises group in all outcomes, pain, flexion range of motion, functional mobility, and quality of life, after 8 wks of intervention. Authors concluded that the findings of this study concluded that Kinesio taping + combined chain exercises and combined chain exercises were both effective but Kinesio taping plus combined chain exercises was more effective in the management of individuals with knee osteoarthritis.

Heddon et al. (2021) analyzed the efficacy of this elastic taping (ET) (e.g., K-tape) on pain in patients with knee osteoarthritis by using The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score. Amongst all the papers found, 6 Randomized Control Trials (RCT) for a total of 392 participants met the criteria and were included in the review. Three papers out of the 6 RCT had low risks of bias. When the ET was compared to sham taping, the results show no to moderate decreases of WOMAC scores in patients with primary knee osteoarthritis. Limitations were that authors focused on a single index test (WOMAC) and could not perform meta-analyses. Authors included that although ET does not provide strong adverse outcomes, data do not support the use of ET as a treatment alone because of too slight reductions of the WOMAC score for reaching clinical efficiency. Thus, this systematic review shows no strong evidence regarding the use of elastic taping for pain improvement in patients with primary knee osteoarthritis. Pinheiro et al. (2021) analyzed the current evidence about the effects of kinesiology taping (KT) with different amounts of tension in people with knee osteoarthritis (OA). Of the 850 studies identified, eight met the inclusion criteria and were ultimately included in this review. Most studies had moderate quality, with a satisfactory PEDro score. Results showed that KT application with tension was not superior to the application without tension for the outcomes of pain, physical function, range of motion and muscle strength. Evidence for edema, balance and quality of life is still limited. Authors concluded that current evidence does not support the use of kinesiology taping in people with knee OA. Luo and Li (2021) demonstrated whether KT is better than placebo taping, nonelastic taping, or no taping in reducing chronic knee pain. In total, 8 studies involving 416 participants fulfilled the inclusion criteria. Results indicated that KT is better than other tapings (placebo taping or nonelastic taping) in the early four weeks. Treatment methods which were performed for more than six weeks show no significant difference in reducing pain. In studies in which visual analogue scale was measured, a positive effect was observed for KT combined with exercise program. Overall, authors suggest that KT exhibited significant but temporary pain reduction.

Nunes et al. (2021) investigated whether Kinesio taping technique, applied to ankles of healthy people as a preventive intervention and people with ankle injuries, is superior to sham or alternative interventions on ankle function. From 5,572 studies, 84 met the eligibility criteria which evaluated 2,684 people. Fifty-eight meta-analyses from 44 studies were performed (participants in meta-analyses ranging from 27 to 179). Fifty-one meta-analyses reported ineffectiveness of Kinesio taping: moderate evidence for star excursion balance test (anterior direction), jump distance, dorsiflexion range of motion, and plantar flexion torque for healthy people (effect size = 0.08-0.13); low to very-low evidence for balance, jump performance, range of motion, proprioception, muscle capacity and EMG for healthy people; balance for older people; and balance and jump performance for people with chronic instability. Seven meta-analyses reported results favoring Kinesio taping: low to very-low evidence for balance and ankle inversion for healthy people; balance for older people; and balance for people with chronic instability. Authors concluded that the current evidence does not support or encourage the use of Kinesio taping applied to the ankle for improvements in functional performance, regardless the population.

Biz et al. (2022) evaluated the effects of Kinesio Taping (or KT) on sports performances and ankle functions in athletes with chronic ankle instability (CAI). The outcomes considered were gait functions, ROM, muscle activation, postural sway, dynamic balance, lateral landing from a monopodalic drop and agility. In total, 1448 articles were identified and 8 studies were included, with a total of 270 athletes. The application of the tape had a significant effect size on gait functions, ROM, muscle activation and postural sway. Authors concluded that the meta-analysis showed a significant improvement in gait functions (step velocity, step and stride length and reduction in the base of support in dynamics), reduction in the joint ROM in inversion and eversion, decrease in the muscle activation of the long peroneus and decrease in the postural sway in movement in the mid-lateral direction. It is possible to conclude that KT provides a moderate stabilising effect on the ankles of the athletes of most popular contact sports with CAI.

In a prospective, randomized, double-blinded, clinical study using a repeated-measures design, Thelen et al. (2008) determined the short-term clinical efficacy of KT when applied to college students with shoulder pain, as compared to a sham tape application. A total of forty-two (42) subjects with clinically diagnosed rotator cuff tendonitis and/or impingement were randomly assigned to one of two groups: therapeutic KT group or sham KT group. Subjects wore the tape for two (2) consecutive three (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 KT group showed immediate improvement in pain-free shoulder abduction after tape application. No other differences between groups regarding ROM, pain, or disability scores at any time interval were found. The authors concluded that KT may be of some assistance to clinicians in improving pain-free active ROM immediately after tape application for patients with shoulder pain. Utilization of KT for decreasing pain intensity or disability for young patients with suspected shoulder tendonitis/impingement is not supported.

Hsu et al. (2009) investigated the effect of elastic taping on kinematics, muscle activity, and strength of the scapular region in baseball players with shoulder impingement. This is the first study to investigate the effects of KT on the scapular kinematics and muscle performance in baseball players with shoulder impingement syndrome. The application of KT over the lower trapezius muscle improved the lower trapezius activity during sixty (60) to thirty (30) degrees of the lowering phase of arm scaption, and increased scapular posterior tilt at thirty (30) and sixty (60) degrees of arm scaption. These results suggest that KT could be a useful therapeutic and prophylactic assistance both in a rehabilitation clinic and in the field.

Kaya et al. (2011) compared the effectiveness of KT and physical therapy modalities in patients with shoulder impingement syndrome. Patients (n = 55) were treated with KT (n = 30) three (3) times by intervals of three (3) days or a daily program of local modalities (n = 25) for two (2) weeks. Response to treatment was evaluated with the Disability of Arm, Shoulder, and Hand scale (DASH). Patients were questioned for the night pain, daily pain, and pain with motion. DASH and VAS scores decreased significantly in both treatment groups as compared with the baseline levels at weeks one and two. Pain scores were also statistically significantly lower at the first week examination, but not after the second week. KT 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; however modalities alone are not the typical course of shoulder treatment. The authors stated that KT 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. Saracoglu et al. (2018) completed a systematic review to determine whether adding any taping technique to standard physiotherapy care (e.g. exercise, electrotherapy, and manual therapy) alone in patients with shoulder impingement syndrome. The outcome measures were pain, disability, range of motion and muscle strength. Three randomized controlled trials and one controlled trial (135 patients) were included. The results were conflicting and weak on the effectiveness of taping as an adjunct therapy for improvement of pain, disability, range of motion and muscle strength. Authors concluded that clinical taping may be an option for these patients in addition to physiotherapy, but that further study is needed with improved methodology. Celik et al. (2020) evaluated the effects of kinesio taping on shoulder disorders, as a single treatment modality or as conjunction to other treatments. Fourteen studies were included with 680 participants. Kinesio taping did not produce better results on pain compared to sham, or passive treatments. Similarly, kinesio taping was not found superior to sham kinesio taping, exercises, or passive treatments on function. There were no significant differences for range of motion (ROM) compared to sham kinesio taping compared to passive treatment. Overall, effect size was found small to moderate. Authors concluded that despite reported positive effects in some studies, there is no firm evidence of any benefit of kinesio taping on shoulder disorders.

de Oliveira et al. (2021) investigated the use of Kinesiotaping (KT) for treating rotator cuff-related shoulder pain (RCRSP), as its mid- and long-term effects have not been investigated. A total of 52 individuals with RCRSP were randomly assigned to 1 of 2 groups (experimental: KT; control: no-KT), and underwent a 6-week rehabilitation program composed of 10 physical therapy sessions. KT was added to the treatment of the KT group. Symptoms and functional limitations were assessed using the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire (primary outcome); Brief Pain Inventory (BPI); and Western Ontario Rotator Cuff (WORC) index at baseline, 3 weeks, 6 weeks, 12 weeks, and 6 months. AHD, pain-free ROM, and full ROM were measured at baseline and at week 6. No significant group × time interactions were found for any outcomes. Time effects were observed as both groups showed significant improvements for all variables studied; and full ROM abduction. Authors concluded that given symptoms, functional limitations, ROM, and AHD improved in both groups, the addition of KT did not lead to superior outcomes compared with exercise-based treatment alone, in the mid and long term, for individuals with RCRSP.

Letafatkar et al. (2021) investigated if adding Kinesio tape to therapeutic exercise is an effective treatment to improve clinical outcomes compared to therapeutic exercise alone and no intervention, in patients with shoulder impingement syndrome. One hundred and twenty patients (mean (SD): age 37.8 (5.4)) with shoulder impingement syndrome. Patients were randomly assigned to eight-weeks therapeutic exercise alone, therapeutic exercise with Kinesio tape, and control group. Pain was measured with a numerical rating scale and disability and scapular kinematics were measured with a relative questionnaire and motion analysis software respectively, at baseline and after eight-weeks intervention. There was significant differences in therapeutic exercise with Kinesio tape group vs. therapeutic exercise alone and control group respectively for pain, disability, scapular upward rotation at sagittal plane, scapular plane, scapular tilt at sagittal plane, and scapular plane. Therapeutic exercise alone was superior over control group in all significant outcomes. Authors concluded that although therapeutic exercises alone showed positive effect on clinical outcomes, adding Kinesio tape to therapeutic exercises had more significant effects with larger effect sizes. Adding Kinesio tape to therapeutic exercise may be of some assistance to clinicians in improving clinical outcomes in patients with shoulder impingement syndrome. Araya-Quintanilla et al. (2022) determined the effectiveness of kinesiotaping (KT) with or without co-interventions for clinical outcomes in patients with subacromial impingement syndrome (SIS). Ten trials for the quantitative analysis were included. Pain intensity, shoulder function, and shoulder flexion were evaluated. Authors concluded that kinesiotaping with or without co-interventions was not superior to other interventions for improving shoulder pain intensity, function and ROM flexion in patients with SIS.

González-Iglesias et al. (2009) examined the short-term effects of KT, applied to the cervical spine, on neck pain and cervical ROM in individuals with acute whiplash-associated disorders (WADs). A total of forty-one (41) patients (21 females) were randomly assigned to one of two groups: (i) the experimental group received KT to the cervical spine (applied with tension) and (ii) the placebo group received a sham KT application (applied without tension). Both neck pain (11-point numerical pain rating scale) and cervical ROM data were collected at baseline, immediately after the KT application, and at a twenty-four (24) hour follow-up by an assessor blinded to the treatment group of the patients. The group-by-time interaction was statistically significant for pain and all directions of ROM, indicating that patients receiving KT experienced a greater decrease in pain and ROM immediately post-application and at the 24-hour follow-up. The authors concluded that patients with acute WAD receiving an application of KT, applied with proper tension, exhibited statistically significant improvements immediately following application of the KT and at a 24-hour follow-up. However, the improvements in pain and cervical ROM were small and may not be clinically meaningful.

Goodwin et al. (2016) reported on a systematic review to establish the current evidence base for the use of orthotics and taping for people with osteoporotic vertebral fracture (OVF). The review included nine studies comprising two parallel-group randomized controlled trials, four randomized cross-over trials, two before-after (single arm) studies and a parallel group observational study. There were no qualitative studies were identified. The studies included a wide range of outcomes assessing impairments, activities and participation were assessed but the findings were mixed. The quality of studies was limited. The authors concluded that the current evidence for using orthotic devices or taping for people with OVF is inconsistent and of limited quality and therefore careful consideration should be taken by clinicians before prescribing them in practice.

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 KT for acute, subacute, or chronic LBP, radicular pain syndromes or other back-related conditions. Paoloni et al. (2011) conducted a two-part study of 39 patients to evaluate the effect of kinesio taping (KT) on chronic low back pain. Phase I was based on an intra-subject pre-test/post-test procedure where pain intensity was evaluated means of 10cm horizontal visual-analog scale (VAS) score. Phase II was based on a randomized, single-blinded controlled trial where patients were randomized to one of three groups: KT and exercise group, KT alone or exercise alone. Outcomes were assessed at one month after therapy by an investigator who was blinded to treatment assignment, and included pain assessed by VAS, disability assessed by surface electromyographic (sEMG), and disability assessed by the Roland Morris Disability Questionnaire (RMDQ). In the three groups it was noted that there was a significant reduction in pain after treatment, with only the exercise-alone group displayed reduced disability. KT appeared to reduce pain over short follow-up comparable to therapeutic exercise. The study was limited by small sample size and short follow-up timeframe.

Castro-Sanchez et al. (2012) reported on a randomized trial, with concealed allocation, assessor blinding, and intention-to-treat analysis (n=60). The experimental intervention was Kinesio Taping over the lumbar spine for one week and control intervention was sham taping. At one week, the experimental group had significantly greater improvement in disability, by 4 points (95% CI 2 to 6) on the Oswestry score and by 1.2 points (95% CI 0.4 to 2.0) on the Roland-Morris score. It was noted that these effects were not significant four weeks later. The experimental group had a greater decrease in pain than the control group immediately after treatment (mean between-group difference 1.1cm, 95% CI 0.3 to 1.9), which was maintained four weeks later (1.0cm, 95% CI 0.2 to 1.7). Similarly trunk muscle endurance was significantly better at one week (by 23 sec, 95% CI 14 to 32) and four weeks later (by 18 sec, 95% CI 9 to 26). Other outcomes were not significantly affected. The authors concluded that Kinesio Taping reduced disability and pain in people with chronic non-specific low back pain, however, the effects may be too small to be clinically worthwhile. While there was some effect immediately after treatment, the effect did not have lasting effect at four weeks.

Kachanathu et al. (2014) reported on a randomized, controlled trial with the aim of comparing the effect of Kinesio taping (KT) compared with traditional management for nonspecific low back pain (NSLBP).Forty male and female patients were randomly divided into two groups: group 1 (n=20) underwent conventional physical therapy with KT, and group 2 (n=20) underwent only conventional physical therapy. Intervention sessions were three times per week for four weeks. Outcomes were assessed for activities of daily living (ADL) using the Roland-Morris Disability Questionnaire, pain severity using a visual analogue scale, and ranges of motion (ROMs) of trunk flexion and extension using the modified Schober's test. There were significant differences in measures of pain, ADL, and trunk flexion and extension ROMs observed post-intervention within each group. In comparison, there were no significant differences in measures of pain, ADL, and trunk flexion and extension ROMs post intervention between the groups. Vanti et al. (2015) reported on a systematic review of randomized, controlled trials (RCTs) regarding the effects of elastic and non-elastic taping on spinal pain and disability. Eight RCTs were included in the review (n=409). Meta-analysis of four RCTs on low back pain indicated that elastic taping does not significantly reduce pain and disability immediately post-treatment. In addition, results from single trials demonstrated that both elastic and non-elastic taping are not better than placebo or no treatment on spinal disability. Positive results were found for elastic taping, however only for short-term pain reduction in whiplash associated disorders or specific neck pain. In general, it was found that the effect sizes were very small or not clinically relevant, with all results supported by low quality evidence. The authors concluded that the results of the systematic review did not show effectiveness of different types of taping.

Nelson (2016) aimed to review the results of RCTs investigating the effects of KT on chronic LBP. In total, five studies involving 306 subjects met the inclusion criteria and corresponded to the aim of this review. The methodological quality of the included RCTs was good, with a mean score of 6.6 on the 10-point PEDro Scale. Moderate evidence suggests KT, as a sole treatment or in conjunction with another treatment, is no more effective than conventional physical therapy and exercise with respect to improving pain and disability outcomes. There is insufficient evidence suggesting that KT is superior to sham taping in improving pain and disability. Limited evidence suggests that KT is more effective than sham taping in improving range of motion (ROM) and global perceived effect (GPE) in the short term. Very limited evidence indicates that KT is more effective than conventional physical therapy in improving anticipatory postural control of the transversus abdominus muscles and improved cerebral cortex potential. Authors conclude that Kinesio taping is not a substitute for traditional physical therapy or exercise. Rather, KT may be most effective when used as an adjunctive therapy, perhaps by improving ROM, muscular endurance and motor control. More high quality studies that consider the multiple factors that mediate CLBP, in the short, intermediate and long term, are needed to strengthen the evidence of the effectiveness of KT on CLBP. Another 2016 published in the Spine journal (Al-Shareef et al.) was a randomized controlled trial with 2-week Kinesio taping intervention. The aim of the study was to investigate the effectiveness of Kinesiotaping application on pain, functional disability, and trunk flexion range of motion (ROM) in patients with chronic nonspecific low back pain (chronic NSLBP). Forty-four patients with chronic NSLBP were randomized into experimental group (n=21) and placebo group (n=23). The experimental group was treated with Erector Spinae Taping, whereas the placebo group was treated with placebo taping. The primary endpoint was pain intensity on visual analog scale. Secondary endpoints were functional disability on Arabic version of Oswestry disability index (ODI) and trunk flexion ROM on Modified Schober's test. All measurements were recorded at baseline (W0), after 2-week intervention (W2), and at 4-week (W4) follow-up. No significant differences existed at baseline. Authors concluded that Kinesio taping reduces pain and disability and improves trunk flexion ROM after 2 weeks of application. However, these effects were very small to be considered clinically relevant and meaningful when compared with placebo taping.

Added et al. (2016) performed a RCT to determine the effectiveness of Kinesio Taping in patients with chronic nonspecific low back pain when added to a physical therapy program consisting of exercise and manual therapy. One hundred forty-eight patients with chronic nonspecific low back pain were randomly allocated to receive 10 (twice weekly) sessions of physical therapy, consisting of exercise and manual therapy, or the same treatment with the addition of Kinesio Taping applied to the lower back. The primary outcomes were pain intensity and disability (5 weeks after randomization) and the secondary outcomes were pain intensity, disability (3 months and 6 months after randomization), global perceived effect, and satisfaction with care (5 weeks after treatment). Data were collected by a blinded assessor. Authors concluded that patients who received a physical therapy program consisting of exercise and manual therapy did not get additional benefit from the use of Kinesio Taping. Overall, the literature on taping for mechanical low back pain is insufficient to determine effectiveness for pain and function. Much of literature is varied in taping application and methodological limitations. According to the Agency for Healthcare Research and Quality (AHRQ) review on Noninvasive

Treatments for Low Back Pain (Chou et al., 2016), for chronic low back pain, no differences were noted for taping versus exercise therapy in pain and function and no differences were noted between taping and sham taping for function; results for pain were inconsistent and insufficient to draw conclusions from. Authors also noted no trials have noted harms or adverse events.

Araujo et al. (2018) investigated the effectiveness of kinesio taping in patients with chronic low back pain after 6 months from randomization. This was a randomized controlled trial with a 6 months follow up. One hundred and forty eight participants were randomly assigned to the experimental (kinesio taping with skin convolutions) or control (kinesio taping without convolutions-Sham Taping) group. Participants from both groups had the tape reapplied twice a week for four weeks. The outcomes were pain, disability and global impression of recovery after 6 months. After 6 months there were no statistically significant between-group differences in pain intensity, global impression of recovery or disability. Authors concluded that four weeks of kinesio taping treatment was no better than sham taping for patients with chronic low back pain, at 6 months follow-up. Li et al. (2019) explored the effects of kinesiotaping on pain and disability in individuals with chronic low back pain. A total of 10 studies were included in this meta-analysis. A total of 627 participants were involved, with 317 in the kinesiotape group and 310 in the control group. The effects of kinesiotape on pain reduction were not superior to placebo taping, either alone or in conjunction with physical therapy. Kinesiotaping did significantly improve disability when compared to the placebo taping. Authors concluded that given the convenience of kinesiotape, patients may benefit if no other treatment is available.

Luz Júnior et al. (2019) investigated the effects of Kinesio Taping (KT) in patients with nonspecific low back pain. 11 RCTs were included for this systematic review (pooled n=743). Two clinical trials (pooled n=100) compared KT to no intervention at the short-term follow-up. Four studies compared KT to placebo (pooled n=287) at short-term follow-up and two trials (pooled n=100) compared KT to placebo at intermediate-term follow-up. Five trials (pooled n=296) compared KT combined with exercises or electrotherapy to exercises or spinal manipulation alone. No statistically significant difference was found for most comparisons. Authors concluded that very low to moderate quality evidence shows that KT was no better than any other intervention for most the outcomes assessed in patients with chronic nonspecific low back pain. Authors found no evidence to support the use of KT in clinical practice for patients with chronic nonspecific low back pain. Lin et al. (2020) summarized the results of randomized controlled trials on the effectiveness of Kinesio Taping (KT) for chronic nonspecific low back pain (CNLBP) and disability. Eleven RCT studies involving 785 patients were retained for the meta-analysis. Limitations of the review included a lack of homogeneity, different methodologies and treatment duration of KT application, and relatively small sample sizes. Authors concluded that there is low-quality evidence that KT has a beneficial role in pain reduction and disability improvement for patients with CNLBP. More high-quality studies are required to confirm the effects of KT on CNLBP.

Chen et al. (2021) compared conservative care strategies on their efficacy and safety for women with pregnancy-related LBP through systematic review with pairwise meta-analysis and network meta-analysis. Twenty-three studies were included in the qualitative synthesis (18 randomized controlled trials were included in the network meta-analysis). For women with LBP during pregnancy, progressive muscle relaxation therapy and Kinesio Taping reduced pain intensity compared with placebo. Authors concluded that for patients with LBP during pregnancy, progressive muscle relaxation therapy and Kinesio Taping may help to decrease pain, and transcutaneous electrical nerve stimulation may improve physical function. Jassi et al. (2021 investigated the effects of star-shape Kinesio taping (KT) compared with both sham KT and minimal intervention (MI) on pain intensity and postural control. A total of 120 people with chronic low back pain (CLBP) aged 18-60 years (N=120). Interventions were star-shape KT, sham KT (no tension) and MI (educational booklet for self-management). The primary outcome measures were pain intensity and center of pressure (COP) mean sway speed, and disability score (Oswestry Disability Index) was a secondary outcome. The outcomes were obtained immediately after initial KT application, on the seventh day of intervention and at the 1-month follow-up. Authors concluded that results showed no meaningful effect of star-shape KT intervention on pain intensity and postural control in people with CLBP compared with MI or sham KT. The observed reduction of 1.3 units between star-shape KT and MI groups was statistically different, but it could not be considered clinically relevant. The results of this trial suggest that benefits from KT are more likely attributable to contextual factors rather than specific taping parameters.

van Amstel et al. (2021) systematically reviewed the literature to analyze the effect of lumbar elastic tape application on trunk mobility, surpassing the minimal detectable change of the used outcome measurement tool, and to analyze the additional effect of applied tension and direction of elastic tape application in low back pain and participants without low back pain. Eight out of 6799 studies were included; 5 studied individuals with low back pain, and 3 studied participants without low back pain. None of the reported significant changes in trunk mobility due to elastic tape application exceeded the indicated minimal detectable change. No conclusions can be drawn from the direction and applied tension of elastic tape application. Authors concluded that based on the results of this systematic review, there is no evidence supporting the effect of lumbar elastic tape application. We recommend consensus in the use of more reliable and valid instruments in future studies. Sun and Lou (2021) critically examined and evaluated the evidence of recent randomized controlled trials regarding the effectiveness of KT as an adjunct to PT for CLBP for at least 2 weeks in a systematic review and meta-analysis.Twelve randomized controlled trials with a total of 676 patients were included in our study. Mean improvements were significantly higher in the KT+PT group than the PT group for pain score and disability. Of 12 studies based on the pain score, 7 reported KT+PT patients to have significantly less pain at latest follow-up when compared with PA patients. Of 11 studies based on the disability, 8 reported KT+PT patients to have significantly better improvements at latest follow-up when compared with PA patients ($P < .05$). Authors concluded that kinesiotaping combined with physical therapy provided better therapeutic effects regarding pain reduction and disability improvement compared with physical therapy alone in individuals with chronic low back pain.

Williams et al. (2012) completed a meta-analysis of the evidence for the effectiveness of KT in the prevention and treatment of sports injuries. From ninety-seven total articles, only ten met the inclusion criteria (outcome data and control group were used). Of these ten studies, only two investigated sports injuries (shoulder impingement) and only one involved injured athletes. The healthy subjects were identified from a preventive standpoint. Overall, pain relief from KT was not clinically relevant based on results. Range of motion improvements was inconsistent, with a trend toward beneficial results. There was likely a proprioceptive benefit regarding grip force sense error, but not ankle proprioception. Seven outcomes relating to strength were beneficial, though numerous trivial findings occurred for hamstrings, quadriceps, and grip strength measures. Some substantial effects on muscle activity were noted, but it was unclear if these were harmful or beneficial. There was little quality evidence to support the use of KT over other types of taping or versus control groups in the management or prevention of injuries. ROM, strength, and force sense error improvements may be noted in certain populations but further research is needed to confirm these findings. In particular, future studies need to focus on appropriate design to improve the quality of research available. Parreira et al. (2014) conducted a systematic review to evaluate if kinesio tape is more effective than no treatment or sham/placebo in people with musculoskeletal conditions for the outcomes of pain intensity, disability, quality of life, return to work and global impression of recovery. The review included 12 randomized trials involving 495 participants with various musculoskeletal conditions. It was found that kinesio taping was no better than sham taping/placebo and active comparison groups. In addition, it was noted that for all comparisons where Kinesio Taping was found to be better than an active or a sham control group, the effect sizes were small and probably not clinically significant or the trials were of low quality.

Montalvo et al. (2014) completed a systematic review and meta-analysis on the effectiveness of KT on pain in individuals with musculoskeletal injuries. Results indicate that KT may have limited potential for pain reduction of musculoskeletal injury; however specific pain measures were not reduced beyond outcomes of other modalities identified within the included studies. Authors suggest that KT may be used in addition or in place of more traditional therapies, but more research is necessary. Lim and Tay (2015) performed a systematic review with meta-analysis focused on pain and methods of tape application. The authors compared the pain and disability in individuals with chronic musculoskeletal pain who were treated with Kinesio taping with those using minimal or other treatment approaches. Seventeen clinical-controlled trials were identified and included in the meta-analyses. When compared to minimal intervention, Kinesio taping was superior to minimal intervention for pain relief. However, existing evidence does not establish the superiority of KT to other treatment approaches to reduce pain and disability in patients with chronic musculoskeletal pain.

There is insufficient evidence in the peer-reviewed literature regarding the efficacy of therapeutic elastic tape for treatment of any indication including musculoskeletal conditions.

Rehabilitation for Neurologic Conditions

In a single-center, randomized, and double-blind study, Karadag-Saygi and colleagues (2010) evaluated the effect of KT as an adjuvant therapy to botulinum toxin A (BTX-A) injection in lower extremity spasticity in twenty (20) hemiplegic patients with spastic equinus foot. A clinical assessment was done before injection and at two (2) weeks and one (1), three (3), and six (6) months. Outcome measures were modified Ashworth scale (MAS), passive ankle dorsiflexion, gait velocity, and step length. Improvement was recorded in both KT and sham groups for all outcome variables. The application of KT combined with botulinum toxin A provided no superior effect compared to sham taping with botulinum toxin A. Improvements were seen for both groups, with the improvement in range of motion being the only outcome that was greater in the treatment group than the sham taping group. Simsek et al. (2011) studied the effects of KT on sitting posture, functional independence and gross motor function in children with cerebral palsy. One group received taping to their trunk in addition to exercises focusing on tone, upper extremity (UE) activities, and sitting and balance reactions. The control group received only exercises. No direct effects of KT were observed on gross motor function and functional independence, though sitting posture (head, neck, foot position and arm, hand function) was affected positively. These results may imply that in clinical settings KT may be a beneficial assistive treatment approach when combined with physical therapy. Güçhan et al. (2017) reported on a systematic review that investigated the effectiveness of taping on the rehabilitation of children with cerebral palsy (CP). The review included nine papers with five randomized controlled trials, three case series, and one a single case study. Four papers were high quality according to the methodological critical forms of this review, and two of these found that taping was effective in increasing activity in children with CP. Seven papers used elastic tape, one paper used inelastic tape, and one used both types. The authors noted that despite some promising results supporting the use of taping by therapists as being a helpful method of reaching rehabilitation goals, the specifics of how and when to use taping to get the best effect remain unclear and that many more randomized controlled trials with larger sample sizes and standardized procedures for the application of taping are required.

Cunha et al. (2017) systematically reviewed the evidence of the effects of elastic therapeutic taping on motor function in children with motor impairments. Final selection consisted of 12 manuscripts (five randomized controlled trials), published in the last 10 years. Among them, cerebral palsy (CP) was the most recurrent disorder (n = 7), followed by congenital muscular torticollis (n = 2) and brachial plexus palsy (n = 2). Positive results were associated with taping application: improvement in the upper limb function, gross motor skills, postural control, muscular balance, and performance in the dynamics functional and daily activities. Authors concluded that although clinical trials have indicated improvement in the postural control and functional activities with both, upper and lower limbs, and increase in the functional independency resulting from the taping use, higher quality studies and well-established protocols are needed to increase the confidence in applying elastic therapeutic taping to specific clinical conditions.

Elbasan et al. (2018) examined the combined effect of NDT, NMES and KT applications on postural control and sitting balance in children with CP. Forty five children, in 3 groups, between the ages 5-12 years were included in the study. Group 1 received NDT; group 2 received NDT + NMES; and the group 3 received NDT + NMES + KT for 6 weeks. Sitting function evaluated by the sitting section of the gross motor function measure (GMFM), and postural control assessed with the seated postural control measurement (SPCM). Seating section of GMFM was improved significantly in all the groups; however, increases in the group 3 were higher than groups 1 and 2. Postural control was also improved in all groups but the change in the third group was higher than groups 1 and 2. Authors concluded that implementation of the NMES, and KT additionally to NDT improve the sitting posture, postural control, seating function, and gross motor function in children with CP. Inamdar et al. (2021) conducted a systematic review and meta-analysis on the effectiveness of physical therapy interventions to improve sitting ability in young children with or at risk for cerebral palsy (CP). Twelve unique studies met the inclusion criteria and were categorized into one of two categories: (1) comparison of two physical therapy interventions or (2) physical therapy plus adjunct versus physical therapy alone. Authors concluded that there is a lack of strong evidence for physical therapy interventions targeting sitting in young children with or at-risk for CP due to limitations in methodological rigor and sample sizes. They did recognize that Kinesio-taping may be an effective adjunct to conventional physical therapy in improving sitting ability in children with spastic bilateral CP. Aydin et al. (2021) investigated the acute effects of kinesiology taping (KT) on physical performance, gait characteristics, and balance in early-stage Duchenne Muscular Dystrophy (DMD). Forty-five children at early functional level of DMD were included. 6-minute walk test (6MWT), and timed performance tests were performed; gait characteristics, and balance were assessed before and one hour after taping. KT was applied to bilateral quadriceps and tibialis anterior muscles. The comparison of assessments was performed by using Wilcoxon Signed Ranks test. Significant increase in the distance of 6MWT, decrease in the duration of descending 4 steps, and 10 m walk timed performance tests, improvements in all of the gait characteristics, and balance were determined after taping. Authors concluded that KT has positive acute effects on performance and gait of children with DMD at early functional level which encourages therapists to use KT as a complementary approach in rehabilitation programs.

Deng et al. (2021) evaluated the effectiveness of kinesio taping for the management of hemiplegic shoulder pain. A total of nine studies (n = 424) met the inclusion criteria. A meta-analysis demonstrated a significant effect of kinesio taping on pain, motor function of upper limb, magnitude of shoulder subluxation and activities of daily living post-intervention. Authors concluded that this meta-analysis suggests a beneficial effect of kinesio taping for reducing shoulder subluxation, improving motor function of the upper limb and activities of daily living in patients with hemiplegic shoulder pain post-intervention, which could not be interpreted simply as a placebo effect. And it was associated with reduced pain for patients with chronic stroke.

Wang et al. (2022) evaluated the efficacy of kinesiology taping on the functions of upper limbs in patients with stroke and to collect the main outcomes evaluated in the analyzed studies. Twelve articles were included. Pooled data provided evidence that there was significance between kinesiology taping groups and control groups in pain intensity, shoulder subluxation, general disability, upper extremity function, and the PROM of flexion. Authors concluded that the current evidence suggested that kinesiology taping could be recommended to improve upper limb function in patients with stroke in pain intensity, shoulder subluxation, general disability, upper extremity function, and the PROM of flexion.

Performance and Function

In pilot study, Fu and associates (2008) examined the possible immediate and delayed effects of KT on muscle strength in quadriceps and hamstring when taping is applied to the anterior thigh of healthy young athletes. 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. KT on the anterior thigh neither decreased nor increased muscle strength in healthy non-injured young athletes. Yoshida and Kahanov (2007) studied the effect of KT on lower trunk range of motion (ROM). Fifteen (15) persons received KT first and had ROM measured first with the tape and then without the tape. The other fifteen (15) subjects were measured without tape first, followed by measurements with tape. The subjects were taped with KT using the Y-shaped method for the sacrospinalis muscle. Results suggested that KT may increase active range of motion of lower trunk flexion even though no effect was identified for extension and lateral flexion. The application of Kinesio tape in a Y-flexion pattern may improve active range of motion of trunk flexion in healthy subjects, but needs to be examined in a population with muscular pathology. Limitations of this study include small sample size, participants without a low back injury and absence of a control group. No studies have specifically studied the effects of KT on low back pain (LBP).

Chang et al. (2010) studied the immediate effect of forearm KT on maximal grip strength and force sense in healthy college athletes. Twenty-one (21) male subjects participated in the study. Pre- and post-maximal grip strength measurements were taken. Fifty percent (50%) of maximal grip strength was established as the reference value for the force sense part of the study. Three (3) conditions were tested: (i) without taping; (ii) with placebo taping; and (iii) with KT. Results demonstrated no significant differences for maximal grip strength, however force sense errors significantly increased the accuracy of the results under the three conditions ($p<0.05$). Chang et al. (2012) also looked at taping in baseball pitchers with medial epicondylitis. This study suggested that forearm KT may affect pain levels and force sense in the short term. It doesn’t appear to affect maximal force production of wrist flexors. Briem and colleagues (2011) examined the effect of two (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). Each participant was tested under three (3) conditions: (i) with the ankle taped with non-elastic, white sports tape, (ii) Kinesio tape, and (iii) with no tape. Significantly greater mean muscle activity was found when ankles were taped with non-elastic tape compared to no tape, while KT had no significant effect on mean or maximum muscle activity compared to the no-tape condition. The authors concluded that non-elastic sports tape may enhance dynamic muscle support of the ankle. The efficacy of KT in preventing ankle sprains via the same mechanism is unlikely as it had no effect on muscle activation of the fibularis longus.

Wilson et al. (2016) investigated the immediate and long-term effects of the prescribed application (for facilitation) of KT when applied to the dominant lower extremity of healthy individuals. The hypothesis was that balance and functional performance would improve with the prescribed application of KT versus the sham application. The application of Kinesio Tex® tape (KT) results, in theory, in the improvement of muscle contractibility by supporting weakened muscles. The effect of KT on muscle strength has been investigated by numerous researchers who have theorized that KT facilitates an immediate increase in muscle strength by generating a concentric pull on the fascia. The effect of KT on balance and functional performance has been controversial because of the inconsistencies of tension and direction of pull required during application of KT and whether its use on healthy individuals provides therapeutic benefits. Seventeen healthy subjects (9 males; 8 females) ranging from 18-35 years of age (mean age 23.3 ± 0.72), volunteered to participate in this study. KT was applied to the gastrocnemius of the participant's dominant leg using a prescribed application to facilitate muscle performance for the experimental group versus a sham application for the control group. The Biodex Balance System and four hop tests were utilized to assess balance, proprioception, and functional performance beginning on the first day including pre- and immediately post-KT application measurements. Subsequent measurements were performed 24, 72, and 120 hours after tape application. Results demonstrated that there were no significant differences for main and interaction effects between KT and sham groups for the balance and four hop tests. Thus authors concluded that the results of the present study did not indicate any significant differences in balance and functional performance when KT was applied to the gastrocnemius muscle of the lower extremity. Yam et al. (2019) conducted a meta-analysis to determine the effectiveness of using a facilitatory application of KT for lower limb muscle strength and functional performance (distance in a single-leg hop and vertical jump height) in individuals without disabilities and in those with musculoskeletal conditions (muscle fatigue, chronic musculoskeletal diseases, and post-operative orthopaedic conditions). Thirty-seven randomised controlled trials were included. KT was superior to controls for improving lower limb muscle strength in individuals with muscle fatigue and in individuals with chronic musculoskeletal diseases with large effect sizes. The use of KT in populations without disabilities was not supported. There is insufficient evidence for the effect of KT on functional performance in individuals with musculoskeletal conditions. Authors concluded that contrary to prior research, the existing evidence shows that KT can improve lower limb muscle strength in individuals with muscle fatigue and chronic musculoskeletal diseases. The effect sizes produced in this meta-analysis show that KT may be superior to some existing treatments for these conditions. In addition, this study suggests that practitioners may wish to avoid the use of KT in individuals without disabilities.

Wang et al. (2018) compared the effect of Kinesio taping on ankle functional performance with that of other taping methods (non-elastic taping) in healthy individuals and patients with ankle sprain. Ten studies fulfilled the inclusion criteria. The Star Excursion Balance Test results indicated that Kinesio taping was superior to other taping methods (placebo taping or tension-free taping). Authors concluded that Kinesio taping is superior to other taping methods (athletic taping) in ankle functional performance improvement. Martonick et al. (2020) investigated whether KT improves factors of neuromuscular control in an athletic population when compared with no-tape or nonelastic taping techniques. Authors found 5 randomized controlled studies comparing the effects of KT with no-tape or nonelastic taping techniques on lower-extremity neuromuscular control in an athletic population. Primary findings suggest KT is not more effective than no-tape or nonelastic tape conditions at improving lower-extremity neuromuscular control in a healthy population. Authors concluded that the current evidence suggests that KT is ineffective for improving neuromuscular control at the ankle compared with nonelastic tape or no-tape conditions. KT was also found to be ineffective at improving hip and knee kinematics in healthy runners and cyclists. However, preliminary research has demonstrated improved neuromuscular control in a population displaying excessive knee valgus during a drop jump landing, after the application of KT. They recommend that clinicians should be cautious of these conflicting results and apply the best available evidence to their evaluation of the patient's status.

Miscellaneous

In a pilot feasibility study, Kalichman and colleagues (2010) evaluated the effect of a KT treatment approach on meralgia paresthetica (MP) symptoms. Main outcome measures were visual analog scale (VAS) of MP symptoms (pain/burning sensation/paresthesia) and VAS global quality of life (QOL); the longest and broadest parts of the symptom area were measured. In this single-group study, all outcome measures significantly improved after four (4) weeks of treatment. The authors concluded that KT can be used in the treatment of MP. Future randomized, placebo-controlled trials should be designed with patients and assessors blind to the type of intervention. Kalron and Bar-Sela (2013) reported on a systematic review that assessed the effects of therapeutic Kinesio Taping (KT) on pain and disability in participants suffering from musculoskeletal, neurological and lymphatic pathologies. Twelve met inclusion criteria. The final 12 articles were subdivided according to the basic pathological disorders: musculoskeletal (N=9) (four randomized, controlled trials (RCT), three single blinded RCT, one cross-over trial and one case-control study); neurological (N=1) (RCT); and, lymphatic (N=2) (RCT). As to the effect on musculoskeletal disorders, moderate evidence was found supporting an immediate reduction in pain while wearing KT. In three out of six studies, reduction of pain was superior to that of the comparison group. However, the studies did not include support that indicated any long-term effect. In addition, no evidence was found connecting the KT application to elevated muscle strength or long-term improved range of movement. There was no evidence found to support the effectiveness of KT for neurological conditions. The authors concluded that although KT has been shown to be effective in aiding short-term pain, there is no firm evidence-based conclusion of the effectiveness of this application on the majority of movement disorders within a wide range of pathologic disabilities.

Rigid Therapeutic Taping

Orthopedic Conditions

Aminaka and Gribble (2008) completed a repeated measures design study looking at patellar taping, patellofemoral pain syndrome (PFPS), lower extremity kinematics and dynamic postural control. Twenty (20) subjects with PFPS and twenty (20) healthy control subjects participated in the study. Participants performed three (3) reaches using the Star Excursion Balance Test with and without tape. Subjects were taped using the medial gliding technique established by Jenny McConnell. Results demonstrated a significant tape by group interaction for pain scores. The PFPS group had reduced pain with taping compared to the no tape condition and the PFPS had significantly higher pain in both tape conditions relative to the control group (as expected). For normalized reach distances, the PFPS group demonstrated less reaching distance than the control group in both tape conditions (again as expected). Additionally, the PFPS group demonstrated a significantly increased reaching distance with tape application vs. no tape. The control group showed a significantly reduced reach with tape vs. without tape. This study may support other study findings that taping reduces knee pain with resultant increases in neuromuscular activity and performance measures, such as this dynamic postural control test. Authors did not feel capable of confirming the underlying mechanism behind their findings.

Callaghan and Selfe (2012) authored a Cochrane Review assessing the effects of patellar taping for treatment of patellofemoral pain syndrome in adults. Taping of the patella involves the application of adhesive sports medical tape (rigid, not elastic) to the front of the knee in a direction or directions that counter malalignment of the patella. Patients often respond with immediate improvement. Studies included in the review included RCTs and quasi-randomized controlled trials testing the effects of patella taping on pain and function. Five (5) studies met this criteria and the majority were at risk of bias. Two hundred (200) participants with a diagnosis of patellofemoral pain syndrome were included in these studies. All studies compared taping versus control groups. Four (4) trials included exercise as well. Given the significant heterogeneity and low quality of the studies, no conclusions could be drawn. Campolo et al. (2013) compared KT and McConnell taping and their effect on anterior knee pain during functional activities. Twenty subjects, mostly female, with unilateral anterior knee pain participated in this study. They performed a squat lift with a weighted box and stair climbing under 3 conditions: 1) no tape, 2) McConnell taping, and 3) KT. Results found that KT and McConnell taping may be effective in reducing pain during stair climbing. Lee and Cho (2013) studied the effect of McConnell taping on the vastus medialis and lateralis activity during squatting in adults with PFPS. Sixteen patients with anterior knee pain received 3 conditions during a squatting activity: 1) no tape, 2) placebo taping, and 3) McConnell taping. Results suggest that McConnell taping improved vastus medialis activity, which authors suggest resulted from a change in patellar position.

Osorio et al. (2013) studied the effects of patellofemoral KT and McConnell taping on strength, endurance and pain. Twenty patients with PFPS participated in this study. Outcome measures evaluated included isokinetic strength and endurance and perceived pain. Results indicated that both taping methods improved clinical measures in patients with PFPS with no significant differences between taping types. Leibbrandt and Louw (2015) presented the available evidence for the effect of McConnell taping on knee biomechanics in individuals with anterior knee pain. Eight heterogeneous studies with a total sample of 220 were included in this review. Pooling of data was possible for three outcomes: average knee extensor moment, average VMO/VL ratio and average VMO-VL onset timing. None of these outcomes revealed significant differences. Authors concluded that the evidence is currently insufficient to justify routine use of the McConnell taping technique in the treatment of anterior knee pain. Chang et al. (2015) conducted a systematic review comparing the effects of Kinesiotaping with McConnell taping as a method of conservative management of patients with patellofemoral pain syndrome (PFPS). Ninety-one articles were selected from the articles that were retrieved from the databases, and 11 articles were included in the analysis. Authors concluded that Kinesio taping technique used for muscles can relieve pain but cannot change patellar alignment, unlike McConnell taping. Both patellar tapings are used differently for PFPS patients and substantially improve muscle activity, motor function, and quality of life.

Araújo et al. (2016) assessed the effect of patellar taping on muscle activation of the knee and hip muscles in women with Patellofemoral Pain Syndrome during five proprioceptive exercises. Forty sedentary women with syndrome were randomly allocated in two groups: Patellar Taping (based in McConnell) and Placebo (vertical taping on patella without any stretching of lateral structures of the knee). Volunteers performed five proprioceptive exercises randomly: Swing apparatus, Mini-trampoline, Bosu balance ball, Anteroposterior sway on a rectangular board and Mediolateral sway on a rectangular board. All exercises were performed in one-leg stance position with injured knee at flexion of 30° during 15s. Muscle activation was measured by surface electromyography across Vastus Medialis, Vastus Lateralis and Gluteus medius muscles. ANOVA results reported no significant interaction ($P>0.05$) and no significant differences ($P>0.05$) between groups and intervention effects in all exercise conditions. Significant differences ($P<0.01$) were only reported between muscles, where hip presented higher activity than knee muscles. Patellar taping is not better than placebo for changes in the muscular activity of both hip and knee muscles during proprioceptive exercises. Logan et al. (2017) performed a systematic review of the effect of taping techniques on patellofemoral pain syndrome. They investigates the efficacy of knee taping in the management of PFPS and hypothesized that tension taping and exercise would be superior to placebo taping and exercise as well as to exercise or taping alone. Studies included consisted of RCTs with participants of all ages who had anterior knee or patellofemoral pain symptoms and had received nonsurgical management using any taping technique. Five RCTs with 235 total patients with multiple intervention arms were included. Taping strategies included McConnell and Kinesiotaping. This systematic review supports knee taping only as an adjunct to traditional exercise therapy for PFPS; however, it does not support taping in isolation.

Ouyang et al. (2017) sought to determine whether therapeutic taping, which includes elastic (Kinesio tape) and non-elastic (Leukotape) taping, is superior to control taping in improving pain and functions for patients with knee arthritis. In total, 11 studies were included in the review. Of which, five Leukotaping and five Kinesio taping studies involving 379 participants were used in the meta-analysis. Authors concluded that therapeutic taping seemed to be superior to control taping in pain control for knee osteoarthritis. Non-elastic taping, but not elastic taping, provides benefits in pain reduction and functional performance. An international group of scientists and clinicians meets biennially at the International Patellofemoral Research Retreat to share research findings related to patellofemoral pain conditions and develop consensus statements using best practice methods. This consensus statement, from the 5th International Patellofemoral Research Retreat held in Australia in July 2017, focuses on exercise therapy and physical interventions (e.g., orthoses, taping and manual therapy) for patellofemoral pain. Recommendations from the expert panel support the use of exercise therapy (especially the combination of hip-focused and knee-focused exercises), combined interventions and foot orthoses to improve pain and/or function in people with patellofemoral pain. The use of patellofemoral, knee or lumbar mobilisations in isolation, or electrophysical agents, is not recommended. There is uncertainty regarding the use of patellar taping/bracing, acupuncture/dry needling, manual soft tissue techniques, blood flow restriction training and gait retraining in patients with patellofemoral pain (Collins et al., 2018).

In the Patellofemoral Pain Clinical Practice Guideline from the Academy of Orthopaedic Physical Therapy of the American Physical Therapy Association authored by Willy et al. (2019), they recommend that clinicians may use tailored patellar taping in combination with exercise therapy to assist in immediate pain reduction, and to enhance outcomes of exercise therapy in the short term (4 weeks). Importantly, taping techniques may not be beneficial in the longer term or when added to more intensive physical therapy. Taping applied with the aim of enhancing muscle function is not recommended.

Vander Doelen and Jelley (2020) determined the most effective non-surgical treatment interventions for reducing pain and improving function for patients with patellar tendinopathy. Studies considered for this systematic review were from peer-reviewed journals published between January 2012 and September 2017. All included studies used a visual analogue scale (VAS) to evaluate the participant's pain. Nine randomized controlled trials fit the inclusion criteria and were analyzed. One study found patellar strapping and sports taping to be effective for reduction in pain during sport and immediately after. Authors concluded that based on this one study, patellar strapping and sports taping demonstrated a short-term pain relieving and functional improvement effect in subjects with patellar tendinopathy. Wallis et al. (2021) conducted a systematic review to evaluate clinical practice guidelines for the physical therapist management of patellofemoral pain. Four clinical practice guidelines were included. One guideline evaluated as higher quality provided the most clinically applicable set of recommendations for examination, interventions, and evaluation processes to assess the effectiveness of interventions. Guideline-recommended interventions were consistent for exercise therapy, foot orthoses, patellar taping, patient education, and combined interventions and did not recommend the use of electrotherapeutic modalities. Two guidelines evaluated as higher quality did not recommend using manual therapy (in isolation), dry needling, and patellar bracing. Authors concluded that recommendations from higher-quality clinical practice guidelines may conflict with routine physical therapist management of patellofemoral pain. This review provides guidance for clinicians to deliver high-value physical therapist management of patellofemoral pain.

Selkowitz et al. (2007) provided moderate evidence to support the use of scapular taping for lower trapezius facilitation and upper trapezius inhibition in subjects with SIS. It has been hypothesized that scapular taping may normalize shoulder function during scapular upward rotation by reducing upper trapezius activity and enhancing lower trapezius muscle activity. Results indicated that when muscle activity was measured during a shelf lift task, upper trapezius activity was significantly lower with taping, especially above ninety (90) degrees. Lower trapezius activity was also significantly higher with tape. No other muscles were affected by the taping application.

Smith et al. (2009) investigated whether taping could change the muscle activity of the upper and lower trapezius in subjects with subacromial impingement syndrome (SIS). Sixteen (16) subjects with SIS and thirty-two (32) controls participated in the study. Surface EMG measured the lower and upper trapezius muscle activity with and without taping during repeated humeral elevation in the scapular plane. Symptomatic subjects demonstrated significantly different muscle activity ratios than the control group, noting increased upper trapezius activity over lower trapezius activity. Taping reduced this ratio significantly by reduction of upper trapezius activity. It appears that taping can help to reduce the resultant trapezius muscle imbalances that occur with SIS.

Miller and Osmotherly (2009) completed a pilot RCT on whether scapula taping facilitates recovery for SIS symptoms. Twenty-two (22) people were recruited into this study. Ten (10) received taping and normal treatment and twelve (12) received normal treatment alone. Scapular taping included two (2) strips- one was anchored over the anterior deltoid and extending posteriorly along the spine of the scapula; and the second strip was anchored over the coracoids process and extended posteriorly in the line of pull of the lower trapezius. Normal treatment included soft tissue massage, joint mobilizations, and scapular and rotator cuff exercises. Primary outcome measures included the visual analogue scale for pain and the SPADI questionnaire. Two (2) weeks following commencement of treatment showed a trend toward greater self-reported improvement in the taped group. These results were not sustained at six (6) weeks. The authors concluded that scapular taping may have a role in treatment of SIS.

McConnell and McIntosh (2009) used rigid taping to reposition the humeral head of asymptomatic tennis players to determine if internal and external rotation ROM was altered. Eleven (11) men and ten (10) female tennis players participated in the study. Results indicated that ROM of each rotation condition increased immediately post taping to the glenohumeral joint in the dominant arm of tennis players. McConnell et al. (2012) followed up their previous study with injured athletes. The goal was to investigate the effect of taping on passive and dynamic internal and external rotation ROM on uninjured and previously injured overhead throwing athletes. Twenty-six (26) overhead throwing athletes (seventeen (17) with no history of shoulder injury and nine (9) with previous shoulder injury) participated in this study. Results demonstrated taping the shoulder significantly increased the passive ROM in both groups. A trend was also noted with increased dynamic rotational ROM in the uninjured subjects, but decreased the dynamic rotational ROM in the previously injured group. Authors concluded that shoulder taping might provide increased protection for the injured athlete by reducing dynamic shoulder rotation. They postulate that this may be due to facilitation of better shoulder and scapular muscle control. Grampurohit et al. (2015) systematically reviewed the efficacy of adhesive taping as an adjunct to physical rehabilitation on outcomes related to body function and structure, activity, and participation post-stroke. Fifteen studies met the inclusion criteria. Two used elastic tape and 13 used rigid tape. The evidence quality ranged from poor to good, and included seven shoulder, one wrist, two hip, one knee, and four ankle studies. There were four good-quality studies. Preliminary evidence suggests that use of rigid adhesive tape as an adjunct may increase the number of pain-free days at the shoulder. Evidence for the improvement of pain intensity, range of motion, muscle tone, strength, or function with taping is inconclusive. The evidence related to activity and participation is insufficient. The use of adhesive taping post-stroke needs further and more rigorous research to compare the types, methods and dosage of taping.

Apeldoom et al. (2017) assessed the effectiveness of individualized physiotherapy in combination with rigid taping compared with individualized physiotherapy alone in patients with subacromial pain syndrome. A total of 140 patients participated in the study. The intervention group received individualized physiotherapy and shoulder taping. The control group received individualized physiotherapy only. Primary outcomes were: pain intensity (numerical rating scale) and functioning (Simple Shoulder Test). Secondary outcomes were: global perceived effect and patient-specific complaints. Data were collected at baseline, and at 4, 12 and 26 weeks' follow-up. Based on results, the authors concluded that rigid shoulder taping cannot be recommended for improving physiotherapy outcomes in people with subacromial pain syndrome.

A systematic review and meta-analysis (Bisset, et al., 2005) of randomized, clinical trials of physical interventions for lateral epicondylalgia (tennis elbow) was performed. Regarding taping as a treatment for this condition, it was noted that, "No firm conclusions on orthotics or tape can be confidently drawn from the outcomes of only three studies that have different timelines for measurements and different comparison groups. Further research is required before any firm conclusions can be drawn." Giray et al. (2019) compared efficacy of kinesiotaping, sham taping, or exercises only in the treatment of lateral epicondylitis. Subjects were 30 patients with lateral epicondylitis for less than 12 weeks and randomized into 3 groups: kinesiotaping plus exercises (n = 10), sham taping plus exercises (n = 10), and control (exercises only) (n = 10) groups. All recipients were provided a home exercise program including strengthening and stretching exercises. In kinesiotaping and sham taping groups, tapings were performed and changed every 3-4 d for 2 weeks. Authors concluded that kinesiotaping in addition to exercises is more effective than sham taping and exercises only in improving pain in daily activities and arm disability due to lateral epicondylitis. Balevi et al. (2021) aimed to evaluate the short term and residual effectiveness of the Kinesio taping method on pain, grip force, quality of life, and functionality. Subjects were 50 patients diagnosed with chronic unilateral lateral epicondylitis with a symptom duration of at least 12 weeks. During the first four weeks, the study group received a true inhibitor Kinesio taping while the control group received sham taping. In both groups, progressive stretching and strengthening exercises were given as a home program for six weeks. After the treatment, patients were evaluated by the first assessor who was blinded to taping types. There was a significant decrease in NRS scores overtime during the first four weeks in both groups and effect sizes were large. Authors concluded that the effects of Kinesio taping on muscle strength, quality of life, and function in chronic lateral epicondylitis are not superior to placebo. However, NRS scores showed that in the two weeks after Kinesio taping treatment, pain reduction persisted as a residual effect which may improve the exercise adherence and functionality

de Sire et al. (2021) investigated the effectiveness of KT compared to a sham taping on symptoms and hand function in patients affected by mild CTS. 42 patients affected by mild CTS with symptoms for at least 8 weeks were enrolled and randomly allocated into two groups: KT group, according to the technique proposed by Kase plus specific exercises; control group, undergoing a sham taping plus specific exercise. All patients performed 2 sessions/week for 5 weeks of exercises of mobilization of fingers and carpal joint. At the baseline, after 5 weeks (T1), and after 6 months (T2), a physician unaware of patients' allocation assessed the Boston Carpal Tunnel Questionnaire (BCTQ) symptom (BCTQ-S) and functional (BCTQ-F) subscales. At T1, in both groups, significant improvement in hand function and symptoms was noted. At T2, only in the KT group there was a significant difference in both sub-items of primary outcome. There were significantly better results in the KT group at T1 and T2. The present study showed that KT compared to a sham taping might be more effective in reducing perceived symptoms in mild CTS patients, reporting a clinically significant difference. Authors concluded that KT might be considered as an effective technique combined to rehabilitative treatment in terms of hand function and symptoms in patients affected by mild CTS.

Cupler et al. (2020) summarized and map the evidence related to taping methods used for various joints and conditions of the musculoskeletal system. Eligible studies were selected by two independent reviewers and included either systematic reviews (SRs) or randomized controlled trials (RCTs) and included a musculoskeletal complaint using a clinical outcome measure. Twenty-five musculoskeletal conditions were summarized from forty-one SRs and 127 RCTs. There were 6 SRs and 49 RCTs for spinal conditions. Kinesio tape was the most common type of tape considered. There is mixed quality evidence of effectiveness for the different types of taping methods for different body regions and conditions. Results included the following:

Lower Extremity

- There is moderate evidence that the inclusion of KT in the treatment plan of PFPS is equivocal. There is moderate evidence that the inclusion of McConnell taping (Mc-T) in the treatment plan of PFPS is equivocal.
- There is strong evidence that rigid taping is a useful adjunctive treatment in the management of pain and function in the short-term for patients with knee OA.
- There is moderate evidence that the inclusion of KT in the treatment of knee OA is favorable.
- There is moderate evidence that Mc-T is favorable in the treatment of pain and function for knee OA.
- There is promising weak evidence that rigid taping is superior to cast immobilization for recurrence of lateral patellar dislocation.
- There is promising weak evidence that KT is superior to orthotics for the management of tibial stress syndrome with respect to pain and function.

- There is moderate evidence that the inclusion of rigid taping in the treatment plan of grade II and grade III ankle sprains is equivocal.
- There is moderate evidence that the inclusion of KT in the treatment plan of grade II and grade III ankle sprains is unfavorable.
- There is moderate evidence that the inclusion of rigid taping in the treatment of plantar fasciitis or heel pain is equivocal.
- There is promising weak evidence that KT taping may provide adjunctive benefit to multimodal conservative treatment for plantar fasciitis or heel pain.
- There is promising weak evidence that Mulligan taping may provide adjunctive benefit to multimodal conservative treatment for plantar fasciitis or heel pain.

Upper Extremity

- There is moderate evidence that rigid taping provides additional improvement to exercise and manual therapy for the treatment of SIS conditions.
- There is moderate evidence that the inclusion of KT in the treatment plan of SIS is equivocal.
- There is promising weak evidence that Mulligan taping adds benefit to manual therapy in the treatment of SIS conditions.
- There is promising weak evidence that rigid taping is a useful adjunct to physical therapy for pain or disability in the treatment of lateral epicondylalgia.
- There is moderate evidence that the use of KT as adjunct to physical therapy for pain or disability in the treatment of lateral epicondylalgia is equivocal.
- There is moderate evidence that the use of KT in the treatment of pain and disability for carpal tunnel syndrome is equivocal.
- There is promising weak evidence that KT provides benefits to improve pain or swelling in the treatment of de Quervain’s syndrome.
- There is promising weak evidence that rigid tape provides benefit to improve pain and function in the treatment of dorsal wrist pain.
- There is moderate evidence that KT to improve pain or functional improvement in the treatment of OA of the proximal interphalangeal joint is equivocal.

Spine

- There is moderate quality evidence that KT provides adjunctive benefit to minimal care for pain control for the treatment of acute low back pain.
- There is moderate evidence that the inclusion of KT in the treatment plan of lumbar disc herniation is equivocal.
- There is moderate evidence that KT is beneficial for improving pain and disability for the treatment of pregnancy-related low back pain.
- There is moderate evidence that KT is beneficial for improving pain and function for the treatment of diastasis recti abdominis.
- There is strong evidence that KT improves pain and disability in patients with chronic non-specific low back pain.
- There is weak quality evidence that rigid tape is superior to no treatment for pain and function for the treatment of sacroiliac joint dysfunction.
- There is moderate evidence that KT alone or as part of multimodal rehabilitation is equivocal in the treatment of pain and kyphotic angle in cases of postmenopausal osteoporosis.
- There is strong evidence that KT for mechanical neck pain is discouraged.
- There is moderate evidence that the inclusion of KT in the treatment plan of upper trapezius pain is equivocal.
- There is moderate evidence that the inclusion of KT in the treatment plan of whiplash associated neck pain is equivocal.

Miscellaneous

- There is moderate evidence that KT is not superior in the treatment of pain and disability compared to occlusal splint, ischemic compression or exercise in people with temporomandibular joint dysfunction.
- There is weak evidence that KT is not beneficial for pain and function in patients with myofascial pain syndrome.

- There is weak evidence that rigid taping may be beneficial for pain and function in people with active osteoporotic compression fractures.

Neurologic Conditions

Hanger et al. (2000) completed an RCT of strapping to prevent post-stroke shoulder pain. Often patients who have suffered a stroke with resultant hemiplegia experience shoulder pain due to instability and tissue stress. Authors suggest that strapping, using rigid taping methods, may prevent shoulder pain, assist with reducing the severity of pain, maintain ROM, and improve functional outcomes for the upper extremity and patient. All ninety-eight (98) patients included in the study had weakness of shoulder abduction. The treatment group received strapping for six (6) weeks in addition to standard physical therapy. The control group received only standard care with no strapping. No significant differences were noted for pain, ROM, or functional outcomes after each assessment. There was trend for pain reduction at six (6) weeks and upper limb function at the final assessment.

Griffin and Bernhardt (2006) also conducted an RCT on hemiplegic shoulder pain and strapping. They wanted to determine whether therapeutic strapping of the ‘at risk’ shoulder prevented or delayed pain in the shoulder of hemiplegic patients. Thirty-three (33) ‘at risk’ patients were identified based on whether muscle function was low or non-existent around the shoulder. They were then randomized into two (2) groups- therapeutic or placebo strapping for four (4) weeks. The third or “control” group received standard care without taping. Results demonstrated a significant higher number of pain-free days between the therapeutic strapping group and the control group (26.2 vs. 15.9 days). ROM and function improved but no significant differences were noted between groups. Placebo strapping also had an effect but a larger sample size is needed to confirm whether there are differences between the therapeutic and placebo strapping.

Kilbreath et al. (2006) completed a study on gluteal taping and its impact on hip extension in walking following stroke. McConnell has described gluteal taping as a strategy to improve hip and pelvis mechanics in patients with chronic low back pain. She hypothesized that taping may reduce the effective muscle length, placing it at a mechanical advantage. It may also restrict flexion of the hip or improve proprioception at the hip joint as well. This study attempted to relate these theories to gait following stroke. Fifteen (15) volunteers with a history of stroke participated in this study. Three (3) conditions were completed- control with no tape, gluteal taping, and sham taping. Gluteal taping used three (3) strips; one going medial to lateral and superior to greater trochanter, another from medial aspect to top of buttock, and third from the superior end of the second piece of tape to the greater trochanter. Sham taping included two (2) pieces, both placed horizontally across the buttock. Findings demonstrated that gluteal taping resulted in an immediate improvement in hip extension at the end of single support, with a small increase in step length on the unaffected side. As soon as the tape was removed the change was lost. The mechanism of effect of gluteal taping was not confirmed; however authors postulate that proprioceptive alterations are not likely given that sham taping did not result in any change.

Cupler et al. (2020) summarized and map the evidence related to taping methods used for various joints and conditions of the musculoskeletal system. Eligible studies were selected by two independent reviewers and included either systematic reviews (SRs) or randomized controlled trials (RCTs) and included a musculoskeletal complaint using a clinical outcome measure. Twenty-five musculoskeletal conditions were summarized from forty-one SRs and 127 RCTs. There were 6 SRs and 49 RCTs for spinal conditions. Kinesio tape was the most common type of tape considered. There is mixed quality evidence of effectiveness for the different types of taping methods for different body regions and conditions. Results included the following:

Lower Extremity

- There is moderate evidence that the inclusion of KT in the treatment plan of PFPS is equivocal. There is moderate evidence that the inclusion of McConnell taping (Mc-T) in the treatment plan of PFPS is equivocal.
- There is strong evidence that rigid taping is a useful adjunctive treatment in the management of pain and function in the short-term for patients with knee OA.
- There is moderate evidence that the inclusion of KT in the treatment of knee OA is favorable.
- There is moderate evidence that Mc-T is favorable in the treatment of pain and function for knee OA.
- There is promising weak evidence that rigid taping is superior to cast immobilization for recurrence of lateral patellar dislocation.

- There is promising weak evidence that KT is superior to orthotics for the management of tibial stress syndrome with respect to pain and function.
- There is moderate evidence that the inclusion of rigid taping in the treatment plan of grade II and grade III ankle sprains is equivocal.
- There is moderate evidence that the inclusion of KT in the treatment plan of grade II and grade III ankle sprains is unfavorable.
- There is moderate evidence that the inclusion of rigid taping in the treatment of plantar fasciitis or heel pain is equivocal.
- There is promising weak evidence that KT taping may provide adjunctive benefit to multimodal conservative treatment for plantar fasciitis or heel pain.
- There is promising weak evidence that Mulligan taping may provide adjunctive benefit to multimodal conservative treatment for plantar fasciitis or heel pain.

Upper Extremity
- There is moderate evidence that rigid taping provides additional improvement to exercise and manual therapy for the treatment of SIS conditions.
- There is moderate evidence that the inclusion of KT in the treatment plan of SIS is equivocal.
- There is promising weak evidence that Mulligan taping adds benefit to manual therapy in the treatment of SIS conditions.
- There is promising weak evidence that rigid taping is a useful adjunct to physical therapy for pain or disability in the treatment of lateral epicondylalgia.
- There is moderate evidence that the use of KT as adjunct to physical therapy for pain or disability in the treatment of lateral epicondylalgia is equivocal.
- There is moderate evidence that the use of KT in the treatment of pain and disability for carpal tunnel syndrome is equivocal.
- There is promising weak evidence that KT provides benefits to improve pain or swelling in the treatment of de Quervain’s syndrome.
- There is promising weak evidence that rigid tape provides benefit to improve pain and function in the treatment of dorsal wrist pain.
- There is moderate evidence that KT to improve pain or functional improvement in the treatment of OA of the proximal interphalangeal joint is equivocal.

Spine
- There is moderate quality evidence that KT provides adjunctive benefit to minimal care for pain control for the treatment of acute low back pain.
- There is moderate evidence that the inclusion of KT in the treatment plan of lumbar disc herniation is equivocal.
- There is moderate evidence that KT is beneficial for improving pain and disability for the treatment of pregnancy-related low back pain.
- There is moderate evidence that KT is beneficial for improving pain and function for the treatment of diastasis recti abdominis.
- There is strong evidence that KT improves pain and disability in patients with chronic non-specific low back pain.
- There is weak quality evidence that rigid tape is superior to no treatment for pain and function for the treatment of sacroiliac joint dysfunction.
- There is moderate evidence that KT alone or as part of multimodal rehabilitation is equivocal in the treatment of pain and kyphotic angle in cases of postmenopausal osteoporosis.
- There is strong evidence that KT for mechanical neck pain is discouraged.
- There is moderate evidence that the inclusion of KT in the treatment plan of upper trapezius pain is equivocal.
- There is moderate evidence that the inclusion of KT in the treatment plan of whiplash associated neck pain is equivocal.

Miscellaneous
- There is moderate evidence that KT is not superior in the treatment of pain and disability compared to occlusal splint, ischemic compression or exercise in people with temporomandibular joint dysfunction.

- There is weak evidence that KT is not beneficial for pain and function in patients with myofascial pain syndrome.
- There is weak evidence that rigid taping may be beneficial for pain and function in people with active osteoporotic compression fractures.

Coding Information

Note: 1) This list of codes may not be all-inclusive.
2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

Strapping of Hand or Finger

CPT®* Codes	Description
29280	Strapping; hand or finger

Coverage is limited to encounters only as identified by the 7th character of "A" or "B" in the codes below.

ICD-10-CM Diagnosis Codes	Description
M24.441	Recurrent dislocation, right hand
M24.442	Recurrent dislocation, left hand
M24.443	Recurrent dislocation, unspecified hand
M24.444	Recurrent dislocation, right finger
M24.445	Recurrent dislocation, left finger
M24.446	Recurrent dislocation, unspecified finger
S61.009A	Unspecified open wound of unspecified thumb without damage to nail, initial encounter
S61.209A	Unspecified open wound of unspecified finger without damage to nail, initial encounter
S61.409A	Unspecified open wound of unspecified hand, initial encounter
S62.501A-S62.509B	Fracture of unspecified phalanx of thumb, initial encounter for closed or open fracture
S62.511A-S62.516B	Fracture of proximal phalanx of thumb, initial encounter for closed or open fracture
S62.521A-S62.526B	Fracture of distal phalanx of thumb, initial encounter for closed or open fracture
S62.600A-S62.609B	Fracture of other and unspecified finger(s), initial encounter for closed or open fracture
S62.610A-S62.619B	Displaced fracture of proximal phalanx of finger, initial encounter for closed or open fracture
S62.620A-S62.629B	Displaced fracture of middle phalanx of finger, initial encounter for closed or open fracture
S62.630A-S62.639B	Displaced fracture of distal phalanx of finger, initial encounter for closed or open fracture
S62.640A-S62.649B	Nondisplaced fracture of proximal phalanx of finger, initial encounter for closed or open fracture
S62.650A-S62.659B	Nondisplaced fracture of middle phalanx of finger, initial encounter for closed or open fracture
S62.660A-S62.669B	Nondisplaced fracture of distal phalanx of finger, initial encounter for closed or open fracture

S62.90XA-S62.92XB	Unspecified fracture of wrist and hand, initial encounter for closed or open fracture
S63.101A-S63.106A	Unspecified subluxation and dislocation of thumb, initial encounter
S63.111A-S63.116A	Subluxation and dislocation of metacarpophalangeal joint of thumb, initial encounter
S63.121A-S63.126A	Subluxation and dislocation of interphalangeal joint of thumb, initial encounter
S63.200A-S63.209A	Unspecified subluxation of other finger(s), initial encounter
S63.210A-S63.219A	Subluxation of metacarpophalangeal joint of finger, initial encounter
S63.220A-S63.229A	Subluxation of unspecified interphalangeal joint of finger, initial encounter
S63.230A-S63.239A	Subluxation of proximal interphalangeal joint of finger, initial encounter
S63.240A-S63.249A	Subluxation of distal interphalangeal joint of finger, initial encounter
S63.250A-S63.259A	Unspecified dislocation of other finger, initial encounter
S63.260A-S63.269A	Dislocation of metacarpophalangeal joint of finger, initial encounter
S63.270A-S63.279A	Dislocation of unspecified interphalangeal joint of finger, initial encounter
S63.280A-S63.289A	Dislocation of proximal interphalangeal joint of finger, initial encounter
S63.290A-S63.299A	Dislocation of distal interphalangeal joint of finger, initial encounter

Not Covered or Reimbursable:

ICD-10-CM Diagnosis Codes	Description
	All other codes

Strapping of Ankle or Foot

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

CPT®* Codes	Description
29540	Strapping; ankle and/or foot

Coverage is limited to encounters only as identified by the 7th character of "A" or "B" or "D" in the codes below.

ICD-10-CM Diagnosis Codes	Description
G57.51	Tarsal tunnel syndrome, right lower limb
G57.52	Tarsal tunnel syndrome, left lower limb
G57.53	Tarsal tunnel syndrome, bilateral lower limbs
G57.61	Lesion of plantar nerve, right lower limb
G57.62	Lesion of plantar nerve, left lower limb
G57.63	Lesion of plantar nerve, bilateral lower limbs

M65.261	Calcific tendinitis, right lower leg
M65.262	Calcific tendinitis, left lower leg
M65.271	Calcific tendinitis, right ankle and foot
M65.272	Calcific tendinitis, left ankle and foot
M65.29	Calcific tendinitis, multiple sites
M65.861	Other synovitis and tenosynovitis, right lower leg
M65.862	Other synovitis and tenosynovitis, left lower leg
M65.871	Other synovitis and tenosynovitis, right ankle and foot
M65.872	Other synovitis and tenosynovitis, left ankle and foot
M65.879	Other synovitis and tenosynovitis, unspecified ankle and foot
M66.271	Spontaneous rupture of extensor tendons, right ankle and foot
M66.272	Spontaneous rupture of extensor tendons, left ankle and foot
M66.361	Spontaneous rupture of flexor tendons, right lower leg
M66.362	Spontaneous rupture of flexor tendons, left lower leg
M67.01	Short Achilles tendon (acquired), right ankle
M67.02	Short Achilles tendon (acquired), left ankle
M67.371	Transient synovitis, right ankle and foot
M67.372	Transient synovitis, left ankle and foot
M67.379	Transient synovitis, unspecified ankle and foot
M67.871	Other specified disorders of synovium, right ankle and foot
M67.872	Other specified disorders of synovium, left ankle and foot
M67.873	Other specified disorders of tendon, right ankle and foot
M67.874	Other specified disorders of tendon, left ankle and foot
M67.88	Other specified disorders of synovium and tendon, other site
M72.2	Plantar fascial fibromatosis
M76.60	Achilles tendinitis, unspecified leg
M76.61	Achilles tendinitis, right leg
M76.62	Achilles tendinitis, left leg
M76.71	Peroneal tendinitis, right leg
M76.72	Peroneal tendinitis, left leg
M76.811	Anterior tibial syndrome, right leg
M76.812	Anterior tibial syndrome, left leg
M76.819	Anterior tibial syndrome, unspecified leg
M76.821	Posterior tibial tendinitis, right leg
M76.822	Posterior tibial tendinitis, left leg
M76.829	Posterior tibial tendinitis, unspecified leg
S82.51XA	Displaced fracture of medial malleolus of right tibia, initial encounter for closed fracture
S82.51XD	Displaced fracture of medial malleolus of right tibia, subsequent encounter for closed fracture with routine healing
S82.52XA	Displaced fracture of medial malleolus of left tibia, initial encounter for closed fracture
S82.52XD	Displaced fracture of medial malleolus of left tibia, subsequent encounter for closed fracture with routine healing
S82.54XA	Nondisplaced fracture of medial malleolus of right tibia, initial encounter for closed fracture
S82.54XD	Nondisplaced fracture of medial malleolus of right tibia, subsequent encounter for closed fracture with routine healing
S82.55XA	Nondisplaced fracture of medial malleolus of left tibia, initial encounter for closed fracture
S82.55XD	Nondisplaced fracture of medial malleolus of left tibia, subsequent encounter for closed fracture with routine healing
S82.61XA-S82.66XD†	Fracture of lateral malleolus
S86.011A-S86.019D†	Strain of Achilles tendon
S86.311A	Strain of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, right leg, initial encounter
S86.311D	Strain of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, right leg, subsequent encounter

S86.312A	Strain of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, left leg, initial encounter
S86.312D	Strain of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, left leg, subsequent encounter
S86.391A	Other injury of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, right leg, initial encounter
S86.391D	Other injury of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, right leg, subsequent encounter
S86.392A	Other injury of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, left leg, initial encounter
S86.392D	Other injury of muscle(s) and tendon(s) of peroneal muscle group at lower leg level, left leg, subsequent encounter
S92.011A-S92.016D†	Fracture of body of calcaneus
S92.021A-S92.026D†	Fracture of anterior process of calcaneus
S92.031A-S92.036D†	Avulsion fracture of tuberosity of calcaneus
S92.041A-S92.046D†	Other fracture of tuberosity of calcaneus
S92.051A-S92.056D†	Other extraarticular fracture of calcaneus
S92.061A	Displaced intraarticular fracture of right calcaneus, initial encounter for closed fracture
S92.061D	Displaced intraarticular fracture of right calcaneus, subsequent encounter for fracture with routine healing
S92.062A	Displaced intraarticular fracture of left calcaneus, initial encounter for closed fracture
S92.062D	Displaced intraarticular fracture of left calcaneus, subsequent encounter for fracture with routine healing
S92.063A	Displaced intraarticular fracture of unspecified calcaneus, initial encounter for closed fracture
S92.063D	Displaced intraarticular fracture of unspecified calcaneus, subsequent encounter for fracture with routine healing
S92.064A	Nondisplaced intraarticular fracture of right calcaneus, initial encounter for closed fracture
S92.064D	Nondisplaced intraarticular fracture of right calcaneus, subsequent encounter for fracture with routine healing
S92.065A	Nondisplaced intraarticular fracture of left calcaneus, initial encounter for closed fracture
S92.065D	Nondisplaced intraarticular fracture of left calcaneus, subsequent encounter for fracture with routine healing
S92.111A-S92.116D†	Fracture of neck of talus
S92.121A-S92.126D†	Fracture of body of talus
S92.131A-S92.136D†	Fracture of posterior process of talus
S92.141A-S92.146D†	Dome fracture of talus
S92.151A-S92.156D†	Avulsion fracture (chip fracture) of talus
S92.191A	Other fracture of right talus, initial encounter for closed fracture
S92.191D	Other fracture of right talus, subsequent encounter for fracture with routine healing
S92.192A	Other fracture of left talus, initial encounter for closed fracture
S92.192D	Other fracture of left talus, subsequent encounter for fracture with routine healing
S92.211A	Displaced fracture of cuboid bone of right foot, initial encounter for closed fracture
S92.211B	Displaced fracture of cuboid bone of right foot, initial encounter for open fracture
S92.211D	Displaced fracture of cuboid bone of right foot, subsequent encounter for fracture with routine healing
S92.212A	Displaced fracture of cuboid bone of left foot, initial encounter for closed fracture

S92.212B	Displaced fracture of cuboid bone of left foot, initial encounter for open fracture
S92.212D	Displaced fracture of cuboid bone of left foot, subsequent encounter for fracture with routine healing
S92.213A	Displaced fracture of cuboid bone of unspecified foot, initial encounter for closed fracture
S92.213B	Displaced fracture of cuboid bone of unspecified foot, initial encounter for open fracture
S92.213D	Displaced fracture of cuboid bone of unspecified foot, subsequent encounter for fracture with routine healing
S92.214A	Nondisplaced fracture of cuboid bone of right foot, initial encounter for closed fracture
S92.214B	Nondisplaced fracture of cuboid bone of right foot, initial encounter for open fracture
S92.214D	Nondisplaced fracture of cuboid bone of right foot, subsequent encounter for fracture with routine healing
S92.215A	Nondisplaced fracture of cuboid bone of left foot, initial encounter for closed fracture
S92.215B	Nondisplaced fracture of cuboid bone of left foot, initial encounter for open fracture
S92.215D	Nondisplaced fracture of cuboid bone of left foot, subsequent encounter for fracture with routine healing
S92.221A-S92.226D††	Fracture of lateral cuneiform
S92.231A-S92.236D††	Fracture of intermediate cuneiform
S92.241A-S92.246D††	Fracture of medial cuneiform
S92.251A-S92.256D†	Fracture of navicular (scaphoid) of foot
S92.811A-S92.819D††	Other fracture of foot
S93.01XA	Subluxation of right ankle joint, initial encounter
S93.01XD	Subluxation of right ankle joint, subsequent encounter
S93.02XA	Subluxation of left ankle joint, initial encounter
S93.02XD	Subluxation of left ankle joint, subsequent encounter
S93.401A-S93.409D†	Sprain of unspecified ligament of ankle
S93.411A-S93.419D†	Sprain of calcaneofibular ligament
S93.421A-S93.429D†	Sprain of deltoid ligament
S93.431A-S93.439D†	Sprain of tibiofibular ligament
S93.491A-S93.499D†	Sprain of other ligament of ankle
S93.501A-S93.509D†	Sprain of toe
S93.511A-S93.519D†	Sprain of interphalangeal joint of toe
S93.521A-S93.529D†	Sprain of metatarsophalangeal joint of toe
S93.601A-S93.609D†	Sprain of foot
S93.611A-S93.619D†	Sprain of tarsal ligament of foot
S93.621A-S93.629D†	Sprain of tarsometatarsal ligament of foot
S93.691A-S93.699D†	Other sprain of foot
S96.011A	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, right foot, initial encounter

S96.011D	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, right foot, subsequent encounter
S96.012A	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, left foot, initial encounter
S96.012D	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, left foot, subsequent encounter
S96.019A	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, unspecified foot, initial encounter
S96.019D	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, unspecified foot, subsequent encounter
S96.111A-S96.119D†	Strain of muscle and tendon of long extensor muscle of toe at ankle and foot level
S96.211A-S96.219D†	Strain of intrinsic muscle and tendon at ankle and foot level
S96.811A-S96.819D†	Strain of other specified muscles and tendons at ankle and foot level
S96.911A-S96.919D†	Strain of unspecified muscle and tendon at ankle and foot level
S99.001A-S99.009D††	Unspecified physeal fracture of calcaneus
S99.011A-S99.019D††	Salter-Harris Type I physeal fracture of calcaneus
S99.021A-S99.029D††	Salter-Harris Type II physeal fracture of calcaneus
S99.031A-S99.039D††	Salter-Harris Type III physeal fracture of calcaneus
S99.041A-S99.049D††	Salter-Harris Type IV physeal fracture of calcaneus
S99.091A-S99.099D††	Other physeal fracture of calcaneus

†Note: Coverage is limited to encounters only as identified by the 7th character of "A" or "D".

††Note: Coverage is limited to encounters only as identified by the 7th character of "A", "B" and "D".

Not Covered or Reimbursable:

ICD-10-CM Diagnosis Codes	Description
	All other codes

Strapping of Toes

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

CPT®* Codes	Description
29550	Strapping; toes

Coverage is limited to encounters only as identified by the 7th character of "A" or "B" or "D" in the codes below.

ICD-10-CM Diagnosis Codes	

G57.81	Other specified mononeuropathies of right lower limb
G57.82	Other specified mononeuropathies of left lower limb
M20.10	Hallux valgus (acquired), unspecified foot
M20.11	Hallux valgus (acquired), right foot
M20.12	Hallux valgus (acquired), left foot
M20.40	Other hammer toe(s) (acquired), unspecified foot
M20.41	Other hammer toe(s) (acquired), right foot
M20.42	Other hammer toe(s) (acquired), left foot
M20.5X1	Other deformities of toe(s) (acquired), right foot
M20.5X2	Other deformities of toe(s) (acquired), left foot
M20.5X9	Other deformities of toe(s) (acquired), unspecified foot
M21.611	Bunion of right foot
M21.612	Bunion of left foot
M21.619	Bunion of unspecified foot
M21.621	Bunionette of right foot
M21.622	Bunionette of left foot
M21.629	Bunionette of unspecified foot
M84.374A	Stress fracture, right foot, initial encounter for fracture
M84.374D	Stress fracture, right foot, subsequent encounter for fracture with routine healing
M84.375A	Stress fracture, left foot, initial encounter for fracture
M84.375D	Stress fracture, left foot, subsequent encounter for fracture with routine healing
M84.376A	Stress fracture, unspecified foot, initial encounter for fracture
M84.376D	Stress fracture, unspecified foot, subsequent encounter for fracture with routine healing
M84.377A	Stress fracture, right toe(s), initial encounter for fracture
M84.377D	Stress fracture, right toe(s), subsequent encounter for fracture with routine healing
M84.378A	Stress fracture, left toe(s), initial encounter for fracture
M84.378D	Stress fracture, left toe(s), subsequent encounter for fracture with routine healing
M84.379A	Stress fracture, unspecified toe(s), initial encounter for fracture
M84.379D	Stress fracture, unspecified toe(s), subsequent encounter for fracture with routine healing
Q66.89	Other specified congenital deformities of feet
S91.109A	Unspecified open wound of unspecified toe(s) without damage to nail, initial encounter
S91.109D	Unspecified open wound of unspecified toe(s) without damage to nail, subsequent encounter
S91.309A	Unspecified open wound, unspecified foot, initial encounter
S91.309D	Unspecified open wound, unspecified foot, subsequent encounter
S92.201A-S92.209D[††]	Fracture of unspecified tarsal bone(s)
S92.301A-S92.309D[††]	Fracture of unspecified metatarsal bone(s)
S92.311A-S92.316D[††]	Fracture of first metatarsal bone
S92.321A-S92.326D[††]	Fracture of second metatarsal bone
S92.331A-S92.336D[††]	Fracture of third metatarsal bone
S92.341A-S92.346D[††]	Fracture of fourth metatarsal bone
S92.351A-S92.356D[††]	Fracture of fifth metatarsal bone
S92.401A-S92.406D[††]	Unspecified fracture of great toe
S92.411A-S92.416D[††]	Fracture of proximal phalanx of great toe
S92.421A-S92.426D[††]	Fracture of distal phalanx of great toe
S92.491A-S92.499D[††]	Other fracture of great toe

S92.501A-S92.506D††	Unspecified fracture of lesser toe(s)
S92.511A-S92.516D††	Fracture of proximal phalanx of lesser toes(s)
S92.521A-S92.526D††	Fracture of middle phalanx of lesser toe(s)
S92.531A-S92.536D††	Fracture of distal phalanx of lesser toes(s)
S92.591A-S92.599D††	Other fracture of lesser toes(s)
S92.911A-S92.919D††	Unspecified fracture of toe
S93.101A-S93.106D†	Unspecified subluxation and dislocation of toe
S93.111A-S93.119D†	Dislocation of interphalangeal joint
S93.121A-S93.129D†	Dislocation of metatarsophalangeal joint
S93.131A-S93.139D†	Subluxation of interphalangeal joint
S93.141A-S93.149D†	Subluxation of metatarsophalangeal joint
S93.301A-S93.306D†	Unspecified subluxation and dislocation of foot
S93.311A-S93.316D†	Subluxation and dislocation of tarsal joint
S93.321A-S93.326D†	Subluxation and dislocation of tarsometatarsal joint
S93.331A-S93.336D†	Other subluxation and dislocation of foot
S93.501A	Unspecified sprain of right great toe, initial encounter
S93.501D	Unspecified sprain of right great toe, subsequent encounter
S93.502A	Unspecified sprain of left great toe, initial encounter
S93.502D	Unspecified sprain of left great toe, subsequent encounter
S93.504A	Unspecified sprain of right lesser toe(s), initial encounter
S93.504D	Unspecified sprain of right lesser toe(s), subsequent encounter
S93.505A	Unspecified sprain of left lesser toe(s), initial encounter
S93.505D	Unspecified sprain of left lesser toe(s), subsequent encounter
S93.506A	Unspecified sprain of unspecified lesser toe(s), initial encounter
S93.506D	Unspecified sprain of unspecified lesser toe(s), subsequent encounter
S93.509A	Unspecified sprain of unspecified toe(s), initial encounter
S93.509D	Unspecified sprain of unspecified toe(s), subsequent encounter
S93.511A S93.519D†	Sprain of interphalangeal joint of toe
S93.521A-S93.529D†	Sprain of metatarsophalangeal joint of toe
S93.601A-S93.609D†	Unspecified sprain of foot
S93.611A-S93.619D†	Sprain of tarsal ligament of foot
S93.621A-S93.629D†	Sprain of tarsometatarsal ligament of foot
S93.691A-S93.699D†	Other sprain of foot
S96.011A	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, right foot, initial encounter

S96.011D	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, right foot, subsequent encounter
S96.012A	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, left foot, initial encounter
S96.012D	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, left foot, subsequent encounter
S96.019A	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, unspecified foot, initial encounter
S96.019D	Strain of muscle and tendon of long flexor muscle of toe at ankle and foot level, unspecified foot, subsequent encounter
S96.111A-S96.119D†	Strain of muscle and tendon of long extensor muscle of toe at ankle and foot level
S96.211A-S96.219D†	Strain of intrinsic muscle and tendon at ankle and foot level
S96.811A-S96.819D†	Strain of other specified muscles and tendons at ankle and foot level
S96.911A-S96.919D†	Strain of unspecified muscle and tendon at ankle and foot level
S99.101A-S99.109D††	Unspecified physeal fracture of metatarsal
S99.111A-S99.119D††	Salter-Harris Type I physeal fracture of metatarsal
S99.121A-S99.129D††	Salter-Harris Type II physeal fracture of metatarsal
S99.131A-S99.139D††	Salter-Harris Type III physeal fracture of metatarsal
S99.141A-S99.149D††	Salter-Harris Type IV physeal fracture of metatarsal
S99.191A-S99.199D††	Other physeal fracture of metatarsal
S99.201A-S99.209D††	Unspecified physeal fracture of phalanx of toe
S99.211A-S99.219D††	Salter-Harris Type I physeal fracture of phalanx of toe
S99.221A-S99.229D††	Salter-Harris Type II physeal fracture of phalanx of toe
S99.231A-S99.239D††	Salter-Harris Type III physeal fracture of phalanx of toe
S99.241A-S99.249D††	Salter-Harris Type IV physeal fracture of phalanx of toe
S99.291A-S99.299D††	Other physeal fracture of phalanx of toe

†Note: Coverage is limited to encounters only as identified by the 7th character of "A" or "D".

††Note: Coverage is limited to encounters only as identified by the 7th character of "A", "B" and "D".

Not Covered or Reimbursable:

ICD-10-CM Diagnosis Codes	**Description**
	All other codes

Not Covered or Reimbursable:

CPT®* Codes	Description
29200	Strapping; thorax
29240	Strapping; shoulder (eg, Velpeau)
29260	Strapping; elbow or wrist
29520	Strapping; hip
29530	Strapping; knee
29799†	Unlisted procedure, casting or strapping

†Note: Experimental/Investigational/Unproven when used to report strapping of the back.

ICD-10-CM Diagnosis Codes	Description
	All codes

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