FMT BASIC®

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PARTICIPANT NAME:_____

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INTRODUCTION

Welcome to the Functional Movement Techniques (FMT) Basic training course! RockTape is excited to bring this course to you and we're confident that it is the best training available of its kind!

This Study Guide is intended to condense the concepts introduced to you in the Basic course and serve as a companion to the information given by your instructor during your training. The study guide does not follow the lecture slide-by-slide but compiles the research studies that are the foundation of FMT and allows you space for notes, thoughts and questions. The practical portion of the guide gives instructions for the basic taping application frameworks, so for a more comprehensive print resource you should reference the latest edition of RockTape's Power Taping Manual as well as the many complimentary videos of taping applications available on RockTape's website (http://www.rocktape.com). Because Functional Movement Techniques courses are open to many types of practitioners, this guide uses terms such as "clinician," "practitioner" and "manual therapist," as well as "patient" and "client" interchangeably so as to be inclusive of our entire audience at seminars.

While kinesiology taping has been used by manual therapists for over thirty years, its more recent popularity is largely thanks to the exposure it garnered in the 2008 and 2012 Olympic Games, as well as in sports like CrossFit and many others. Millions of viewers all over the world saw Kerri Walsh, whose injured right shoulder was sporting kinesiology tape throughout the 2008 Olympic volleyball competitions, and her partner, Misty May take their second gold medal in women's beach volleyball that year. Sportscasters speculated on this "medicated tape" and wondered if she had gotten some sort of wild tattoo before they realized exactly what she had on her shoulder! Meanwhile, the Japanese men's gymnastics team was using kinesiology tape throughout the competition. Today, even TSA agents in the Sioux Falls Regional Airport in South Dakota are familiar with RockTape and its brand recognition!

Since 2012, kinesiology tape has had a massive renaissance thanks to the huge number of patterns and colors produced by RockTape, as well as their very visible sponsorship of many key athletes across a huge variety of sports. More retailers than ever are selling RockTape and FMT training courses are consistently sold out. Most recently FMT applications have been developed for tactical use in the military and with active training and shooting as well as for use with horses and riders in equestrian sports!

WHAT MAKES ROCKTAPE AND FMT UNIQUE?

Even though kinesiology tape has been around a long time, it has been a very well kept secret for most of its history. RockTape is leading a very visible new movement in kinesiology taping, but RockTape is about a lot more than a great marketing plan and visible exposure to the public.

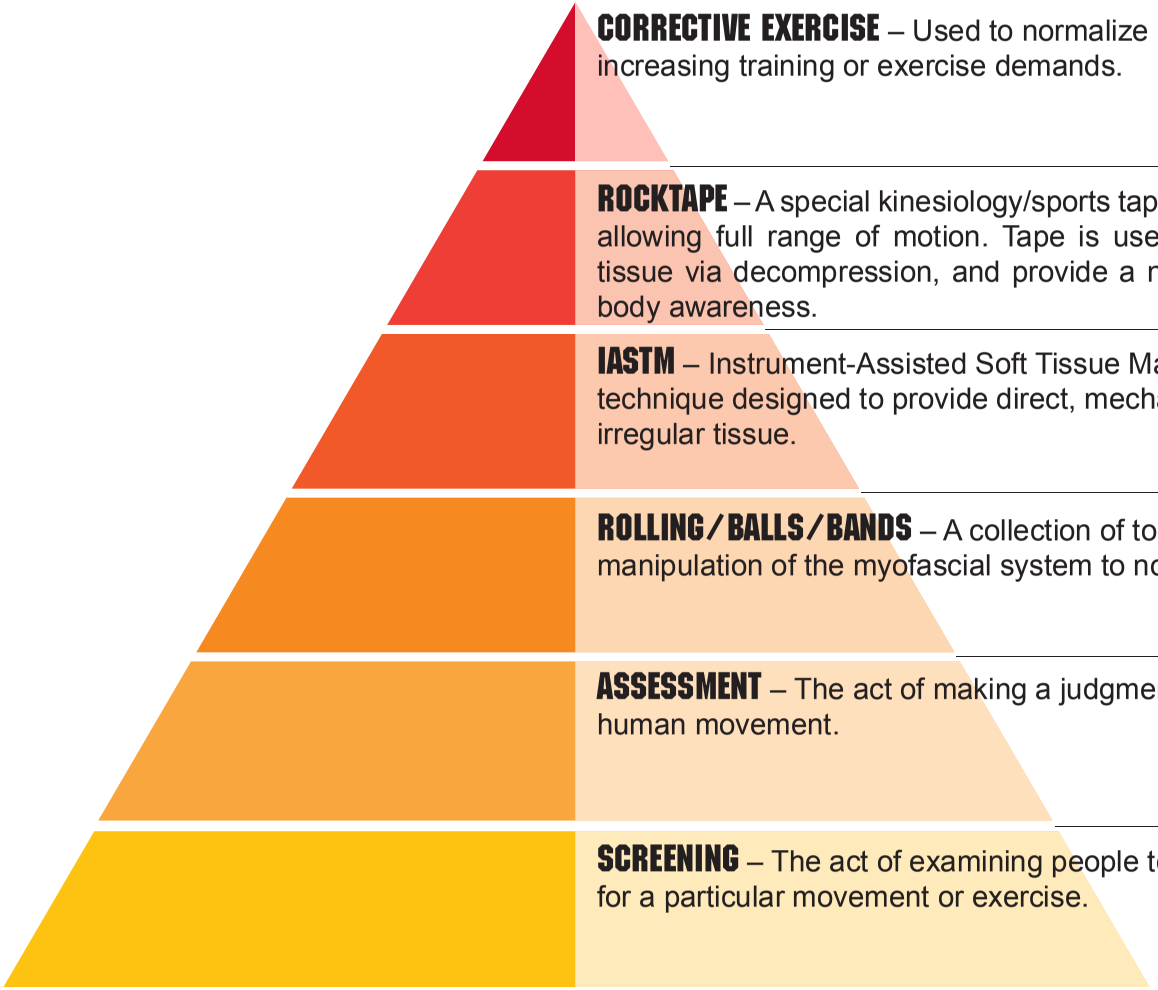
RockTape was initially developed to stick better and last longer than any other K-tape on the market. Indeed, the most common complaint from clinicians, patients and consumers alike was that the available brands of tape were expensive and did not stick for very long. Since FMT took shape from the minds of Dr. Steven Capobianco, Greg van den Dries and their collaborators, the RockTape company has become as much about movement as it is about tape. In a landmark training course at Reebok's CrossFit One facility in Boston, MA company founder, Greg van den Dries, said, "RockTape is not a tape company, we're a movement company."

It's not surprising, then, that one of the primary goals in FMT is to foster proper movement in the people using RockTape, whether that is through treatment of acute injuries, use in chronic cases or for prevention and performance improvement and training.

Functional Movement Techniques was created as a comprehensive framework of taping for each phase of need, from reducing swelling in an acute injury to helping outcomes in the rehabilitation phase of care and finally as an adjunct to training or competition to improve performance and recovery. The developers of FMT recognized the need for a simple, but effective approach that did not require the practitioner to have to memorize books full of taping protocols.

FMT begins with a simple framework that is applied consistently throughout the approach and it is open source in that it pulls from the available best practices in a variety of disciplines. This allows the practitioners using RockTape and the FMT method to make it work for their practices and patients/clients rather than forcing them to have to work around a cumbersome and difficult taping approach. According to feedback from thousands of trained FMT practitioners, we have succeeded with this goal, and then some!

ROCKTAPE MOVEMENT PYRAMID



CORRECTIVE EXERCISE – Used to normalize human movement before increasing training or exercise demands.

ROCKTAPE – A special kinesiology/sports tape that provides support while allowing full range of motion. Tape is used to decrease pain, unload tissue via decompression, and provide a novel stimulus that improves body awareness.

IASTM – Instrument-Assisted Soft Tissue Massage – A manual therapy technique designed to provide direct, mechanical manipulation of irregular tissue.

ROLLING / BALLS / BANDS – A collection of tools used by athletes for manipulation of the myofascial system to normalize muscle tone.

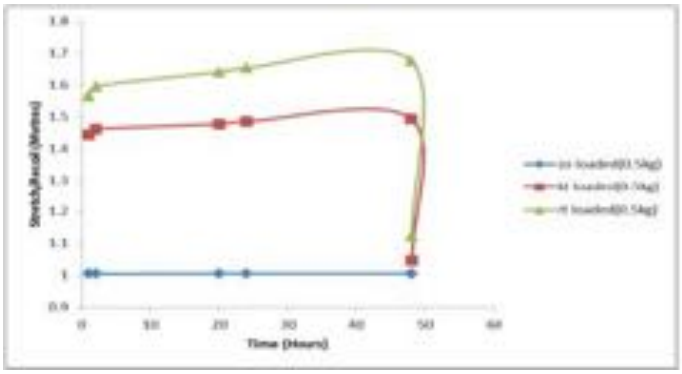
ASSESSMENT – The act of making a judgment about the quality of human movement.

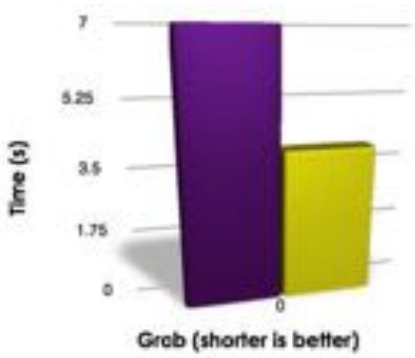
SCREENING – The act of examining people to decide if they are suitable for a particular movement or exercise.

TECHNICAL ASPECTS OF ROCKTAPE

RockTape was developed to stick better to skin and last longer after being applied. K-tape is completely different from traditional types of sports tape in the fact that it stretches along its length (but not across its width), allowing it to contour around body parts and allows joints to move through a full range of motion. Traditional tapes have been used primarily to limit movement, but the goal of using RockTape is to encourage movement.

RockTape is woven from a blend of cotton and nylon fibers in a pattern that allows it to stretch 180% along its length, but not at all across its width. It uses an acrylic, latex-free, essentially hypoallergenic medical adhesive on one side while the other side may be printed with patterns, custom logos or solid colors. The tape is applied to a paper backing that allows it to be applied by practitioners without touching the adhesive. These technical aspects of RockTape are important because tape that stretches more allows more freedom of movement, and it also creates more of a “snapback” or recoil effect, which is important when a taping application is used in the context of movement. Because it is stickier, it will also stay applied longer and with less maintenance on the client’s part. We typically recommend maintaining a tape application for 3-5 days.





Figures showing stretch and stickiness characteristics of RockTape compared to others

RockTape is sold in widths of 1”, etc. and it is the only company that manufactures tape in so many sizes. Scores of colors and patterns are available and RockTape can be made with custom logos when ordered in batches of 480 rolls or more. 1”, 2” and 4” wide rolls are available in lengths of 16.4 feet, and select 2” and 4” wide rolls are also available in bulk rolls that are 105 feel long.

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SECTION 1

EFFECTS AND RESULTS OF ROCKTAPE

EFFECTS OF ROCKTAPE

Purpose of Using RockTape
1. Pain Mitigation 2. Decompression 3. Neurosensory Input

There are two proposed effects of using kinesiology tape that lead to the clinical results enjoyed by patients and practitioners alike. The first effect is that it mechanically decompresses the skin and the underlying tissues it is applied to.

Figure showing decompression effect of RockTape

During your training you will see a video of a diagnostic ultrasound performed on a subject's VMO muscle both un-taped and taped. There is a measurable increase in space between the fascial layers in the ultrasound of the taped thigh, and further experimentation with a larger group of subjects is underway to see if this effect is reproducible on a consistent basis.

Tissue decompression has two primary effects on the body. First, it relieves pressure from the free nerve endings in the tissues that are responsible for nociception (pain), so it can immediately reduce perceived pain. Secondly, the decompression action of the tape allows better circulation to and from the area taped. This reduces swelling at the site of an injury and likely contributes to the performance and recovery effects seen in athletes who use RockTape during training and competitions.

The second major effect of kinesiology taping is the stimulation it provides to the variety of sensory nerves in the skin and underlying tissues. The skin and the connective tissue beneath it are filled with sensory receptors that are responsible for feeling light and heavy touch, fine point discrimination, pain, temperature and pressure. Additionally, some of these receptors serve a proprioception role, meaning they contribute to the brain's sense of where the body's parts are in space and throughout movement.

As RockTape lifts and creates shear patterns in the skin and underlying tissues, there is an alteration of the afferent signals going from the taped area to the brain. As a result, this changes the brain's response to the incoming information, altering the efferent signals returning to the taped area. This neurological effect of taping is responsible for many of the beneficial effects of using RockTape. A study using functional MRI showed more areas of the sensory cortex of the brain are stimulated when subjects had tape (Hypafix, in this case) applied to their knee during movement.[1]

1 Callaghan MJ et al. Effects of patellar taping on brain activity during knee joint proprioception tests using functional magnetic resonance imaging. Physical Therapy. 2012; 92(6): 821-830.

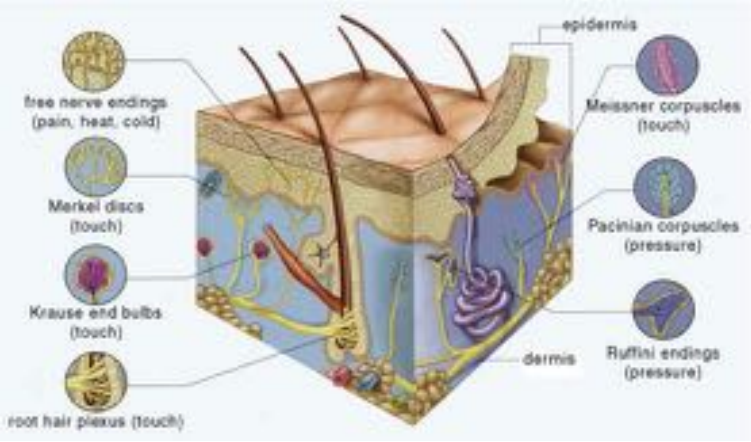

Figure showing types of sensory receptors in skin

Nociception, which is perceived as pain at the conscious level of the brain, shares pathways in the nervous system with movement and proprioception. Most nociception is relayed to the brain via relatively slow nerves. When tape stimulates proprioceptors and other sensory receptors in the skin (most of which travel to the brain on much faster nerves than pain) it has a pain-gate effect. In simple terms, nociception will bombard the brain and be perceived as pain, and the less “interference” there is to the nociception signals, the more pain is perceived. According to the pain gate theory, when larger, faster nerve fibers start to fire more, as in the case of stimulating skin or moving the body, this “closes the gate” to the nociception signals and down-regulates the perception of pain.

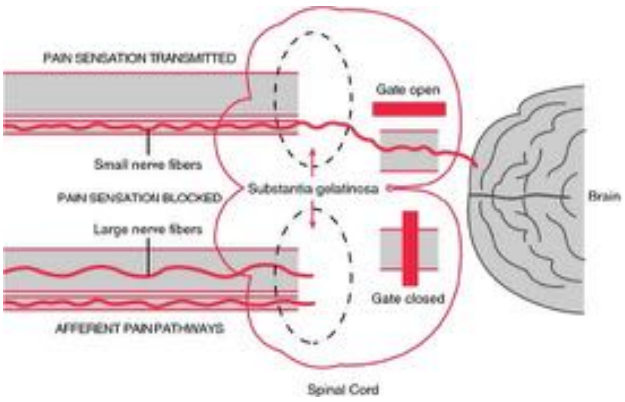

Figure showing the pain-gate theory

This is why people innately deal with pain in similar ways. For example, when you hit your body against something hard and it hurts you tend to rub the area and it feels better. Or if you cut yourself in the kitchen chopping vegetables you run cold water over the cut and the pain decreases dramatically. “Walking it off” helps reduce the pain of many sports injuries because the movement decreases the sensation of pain. This is all due to the pain-gate effect.

Research, which will be explored more in depth later, has also shown that kinesiology tape alters proprioception, muscle contraction timing and force output, as well as range of motion. These effects are all due to the afferent/ efferent response to the skin stimulation created by the tape, and these concepts are explored much more in depth in Level 2 Fascial Movement Taping courses.

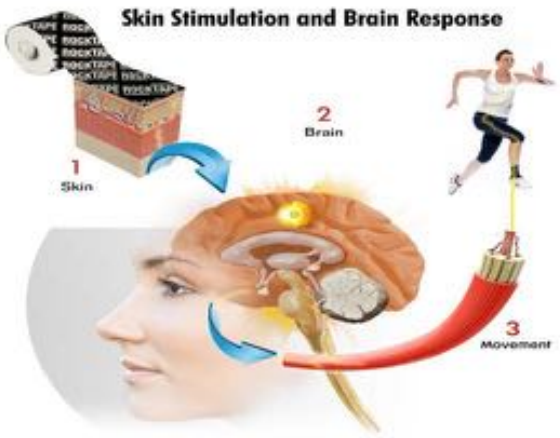

Figure showing how skin alters brain activity and results in movement changes

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SECTION 2

GENERAL TAPING INFORMATION

K-taping, particularly using the FMT framework, can be a quick and effective procedure. That being said there are details that will make the taping applications last longer and more comfortably for the client. Detailed explanations of taping the body's various regions will follow in later sections of this guide, but the guidelines in this section pertain to all FMT methods and should be followed whenever using RockTape.

Health History and Test Patches

Before taping a patient, ask them about their previous history with kinesiology tape, other types of sports tape and other adhesives like Band-Aids®, in particular whether they have had unpleasant reactions to any of these before. For patients who have never used kinesiology tape or who are concerned their skin may be sensitive to it, it is a good idea to use a test patch made from a 1-2 inch square piece of RockTape. Apply it to the inside of the forearm or somewhere similar for at least fifteen minutes, looking for any itching, redness, swelling, burning or other symptoms that would suggest poor tolerance.

Sensitive Skin and Allergies

There is no latex in RockTape so allergies are rare. The adhesive is an acrylic medical adhesive and while allergies to it are rare, still warn patients to remove tape if they experience any symptoms that are uncomfortable while wearing the tape (see Appendix for a sample home instructions form you could adapt for your clients). Most of the time when a patient has a reaction to k-tape it is from overstretching. Overstretching RockTape, especially at the ends or "anchors," is usually the culprit of irritated skin. Never stretch the ends of RockTape, always leaving the last 1-2 inches of each strip free of stretchs.

Be careful of using RockTape in sensitive skin zones, which include:

- Posterior knee
- Neck (both anterior and posterior triangles)
- Inside of arm, axilla and anterior elbow
- High-traffic areas such as hands and feet

Cautions and Contraindications

There are some cautions and contraindications in the use of k-tape. Cautions include sensitive skin and people who are prone to skin allergies, individuals with compromised skin such as infants, elderly and pregnant patients (particularly in the last trimester) and those who have limited ability to communicate discomfort that could be caused by the tape. If skin sensitivity/tolerance is compromised RockTape suggests the gentler form of tape called RockTapeRx which was formulated to be less aggressive as the standard RockTape.

Contraindications to k-tape include open wounds, skin infections, active cancer, deep vein thrombosis, kidney disease and congestive heart failure. The last two examples are particularly true when using tape to help reduce edema. While kinesiology tape is effective in this application it is contraindicated in cases of systemic edema such as kidney disease and congestive heart problems because those patients have a limited ability to handle fluid. Edema taping applications can increase the fluid load on the system and have unwanted effects for these patients.

Tape Care Tips

Once you have determined that it is safe to tape a patient, there are some guidelines to follow to maximize the comfort, longevity and effectiveness of the taping application. The patient's skin must be clean and dry. Oils, both naturally occurring in the skin as well as from cosmetics and lotions greatly reduce the adhesive's ability to bond to the skin. Use soap and water or rubbing alcohol or other skin-safe solvents to prep skin when needed.

If length of hair is impeding adherence of tape application, hair should be shaved or trimmed very short in the areas to be taped. Whenever possible, shaving should be done the day before tape is applied to minimize irritation of the skin. After applying RockTape, vigorously rub the tape to help the adhesive bond faster to the client's skin. Be careful not to catch the edges and corners of the tape when rubbing. It takes approximately one hour for RockTape to bond completely for most people, so it is always best to tape athletes at least an hour, if not the day before, a competition or training session.

The adhesive used on RockTape is water resistant so showers, swimming and other aquatic sports pose little problem for it. RockTape H2O was developed with extra adhesive for patients engaged in intense or long duration aquatic sports or when wetsuits are used, although standard RockTape works well for most clients in most cases. The cotton fibers used in RockTape will absorb water, so patients will notice that it stays wet for 15-20 minutes after being in the water. Caution patients not to use hairdryers or other means to dry the tape more quickly as they will likely burn themselves. When drying with a towel they should be advised to pat the tape rather than rubbing a towel over it as the towel will likely catch the edges of the tape and start to remove it prematurely.

Over the course of several days of wearing the tape, sleeping with it on, bathing with it and wearing clothing over it, RockTape will likely peel up to some degree at the edges. Advise patients to carefully trim any peeled- up edges to maintain the tape. Removal of the tape should be done slowly and methodically in the direction of the hair growth in the taped area. Stubbornly bonded tape can be soaked in baby oil to help emulsify and break down the adhesive for easier removal. Patients should be cautioned against trying to pull the tape off too fast as it is possible to rip the outermost layers of skin if tape is removed carelessly. It is advised to give patients a home care instruction sheet that outlines the basics for them. A sample instruction sheet that you can adapt for your practice and events can be found in the Appendix.

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SECTION 3

FASCIAL MOVEMENT TAPING FRAMEWORK

FMT is an open source approach to kinesiology taping that relies on concepts and frameworks rather than books full of protocols. FMT is useful in the acute, sub-acute and chronic stages of injury healing as well as throughout active rehabilitation. At the other end of the spectrum, FMT is being used to enhance movement and proprioception, as a prevention method in sports and activities and to improve recovery during training cycles in uninjured athletes.

The FMT Basic training includes pain reduction, fluid dynamics taping, postural applications, nerve entrapment and radicular nerve symptoms and scar tissue taping. As you gain familiarity with FMT's basic frameworks, you will quickly see how easy it is to apply RockTape any region of the body, allowing you complete freedom from complicated protocols and taping problems.

RockTape and FMT can be applied to almost any client at any time for the variety of reasons. In the acute stage of an injury the focus of FMT is on pain reduction and controlling edema. Over the course of several days as fluid dynamics are regulated, taping continues to offer pain relief as well as fostering as much normal range of motion and quality of movement as possible. As a patient transitions into the subacute phase of care, where they are likely doing more corrective exercises, FMT frameworks begin to focus more on the proprioception and movement benefits and this carries forward into the prevention, performance improvement and recovery taping taught in FMT Performance courses.

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SECTION 4

PAIN TAPING

It's no secret that RockTape works great for pain! The FMT framework for pain allows a patient to move optimally as quickly as possible following an injury. While pain is a great motivator as well as a protective mechanism, it is well understood that pain immediately begins to alter movement and that once the pain is relieved, there is often a residual suboptimal movement pattern left behind that predisposes the injured person to further injuries and problems.[2]The FMT model of pain taping, therefore, is twofold: to reduce pain itself as well as to help mitigate the lasting movement effects that are created by pain.

A fair number of studies have been devoted to pain as well as changes in range of motion associated with pain or injury. As a general summary these studies seem to backup what practitioners see anecdotally in the field: RockTape can decrease pain almost immediately and throughout the time the tape is applied, and that range of motion improvements take effect immediately.[3]

Case reports have been published on the use of k-tape for radial nerve entrapment[4] as well as brachial plexus injury[5] with positive outcomes. Several studies have investigated the use of k-tape in different types of low back pain cases[6,7] as well as neck pain and loss of range of motion from acute whiplash.[8]

2 Nijs J et al. A review on sensory-motor interaction with focus on clinical implications. Clin J Pain. 2012; 28: 175-181
3 Gonzalez-Iglesias J et al. Kinesio taping compared to physical therapy modalities for the treatment of shoulder impingement syndrome.
4 Anandkumar S. Kinesio tape management for superficial radial nerve entrapment: a case report. Physiotherapy Theory and practice. 2013 Apr;29(3): 232-241.
5 Walsh SF. Treatment of a brachial plexus injury using kinesiotape and exercise. Physiotherapy Theory and Practice. 2010 Oct;26(7): 490-496.
6 Castro-Sanchez AM, et al. Kinesio taping reduces disability and pain slightly in chronic non-specific low back pain: a randomised trial. Journal of Physiotherapy. 2012; 58: 89-95.
7 Chen SM, et al. Effects of functional fascial taping on pain and function in patients with non-specific low back pain: a pilot randomized controlled trial. Clinical Rehabilitation. 2012; 26(10): 924-933.
8 Gonzalez-Iglesias J, et al. Short-term effects of cervical kinesio taping on pain and cervical range of motion in patients with acute whiplash injury: a randomized clinical trial. Journal of Orthopaedic & Sports Therapy. 2009; 39(7): 515-521

Shoulder pain from impingement syndrome[9], myofascial pain[10], and non-specific causes has been an area of interest to researchers.[11] Finally, use of kinesiology tape for pain in the knees[12,13,14] and feet[15,16, 17] has also been studied and published.

The pain relief effects of k-tape almost certainly come from the pain gate effect mentioned previously. In summary, sensory and movement information is carried to the brain on faster, larger caliber nerves than nociception (pain). As more movement and sensory information is perceived by the brain, the "gate closes" on the slower, smaller nociception nerves and less pain is perceived.

9 Kaya E, et al. Kinesio taping compared to physical therapy modalities for the treatment of shoulder impingement syndrome. Clinical Rheumatology. 2011; 30: 201-207.
10 Garcia-Muro F, et al. Treatment of myofascial pain in the shoulder with kinesio taping: a case report. Manual Therapy. 2010 Jun; 15(3): 292-295.
11 Thelen MD, et al. The clinical efficacy of kinesio tape for shoulder pain: a randomized, double-blinded, clinical trial. Journal of Orthopaedic & Sports Physical Therapy. 2008 Jul; 38(7): 389-395.
12 Aytar A, et al. Initial effects of kinesio taping in patients with patellofemoral pain syndrome: a randomized, double-blind study. Isokinetics and Exercise Science. 2011; 19: 135-142.
13 Aytar A, et al. Initial effects of kinesio taping in patients with patellofemoral pain syndrome: a randomized, double-blind study. Isokinetics and Exercise Science. 2011; 19: 135-142.
14 Osterhues DJ. The use of kinesio taping in the management of traumatic patella dislocation: a case study. Physiotherapy Theory and Practice. 2004; 20:267-270.
15 Tsai CT, et al. Effects of short-term treatment with kinesiotaping for plantar fasciitis. Journal of Musculoskeletal Pain. 2010 Mar; 18(1): 71-80.
16 Lee JH and Yoo WG. Treatment of Achilles tendon pain by kinesio taping in an amateur badminton player. Physical Therapy in Sport. 2012 May; 13(2): 115-119.
17 Spina R, et al. The effect of functional fascial taping on Morton's neuroma. Australasian Chiropractic & Osteopathy. 2002 Jul; 10(1): 45-50.

PAIN TAPING METHOD

Pain is reduced by the tape stimulating the myriad of sensory receptors in the skin and adjacent tissues thus ALL FMT taping applications can have a pain reducing effect. While there is a basic framework in FMT for pain taping, you will immediately recognize how easy it is to modify any other tape application to give it some additional pain relief effects.

The FMT framework for pain taping requires between 1-3 pieces of RockTape. These are known as the stabilization strip(s) and the decompression strip. Stabilization strips typically run along the length of the area being taped. For example, a stabilization strip in the low back would be applied from the sacroiliac joint to the thoracolumbar junction bilaterally. A decompression strip is applied perpendicular (90°) to the stabilization strip. Stabilization strips are generally applied with little to no additional stretch (paper-off tension) on the tape while decompression strips are stretched 0-50% in the middle and are applied over the area of greatest pain. It is suggested to begin all taping applications with less stretch until skin tolerance and clinical outcomes are assessed. The anchors of the decompression strip are always applied with paper-off tension. As you can imagine, more than one decompression strip may be used in a taping application to target multiple areas of focal pain.

Photos showing the method used to create and apply a decompression strip

In an effort to maintain the client's full range of motion without the tape restricting movement, it is preferable whenever possible to position the patient to lengthen the area being taped, rather than stretching the tape over an area that is in a neutral position. For example, when taping the low back for pain, have the patient flex forward, stretching the posterior fascial chain and skin before the tape is applied. As a result, the tape can be applied with paper-off tension and still produce significant decompression and lifting, as well as sensory stimulation, but it will not restrict the patient's ability to move. This same principle is applied to all areas and is a key part of the FMT method.

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LOW BACK PAIN TAPING STEP-BY-STEP INSTRUCTIONS

With the above framework in mind, taping for pain can be done easily and quickly in any area of the body as long as the practitioner remembers the stabilization/decompression principle. The example below describes a pain taping application for a patient with generalized low back pain:

- Because this is a spinal taping application, it is best to tape both sides of the spine to retain balance. As such, cut two stabilization strips that go from the sacroiliac joints to the lower ribcage running approximately 1-2” lateral of the spinous processes. Round the edges of the two tape strips.
- Measure a decompression strip that will go across the spine at the most painful area of the low back. Make it long enough so that the anchors will end on skin and not on top of the stabilization strips. Round the edges of the decompression strip.
- Lengthen the region where the tape is being applied by having the patient flex forward. This can be done variety of ways based on the patient’s presentation and level of discomfort, but minimally, have the patient sitting with their elbows on their knees if possible

Stretching/pre-loading the low back

- Apply the first stabilization strip by anchoring the end of one of the strips at the sacroiliac joint. Using paper tension extend the piece of tape up the back about 1-2” lateral of the spinous processes. Repeat for the second stabilization strip on the other side of the spine. Rub both stabilization strips to activate the adhesive.

Photos showing the measuring and application of stabilization strips to the lumbar spine for pain reduction

- To apply the decompression strip, the patient should remain in the forward flexed position. Break the paper backing of the decompression strip in the middle and fold the paper back as if it is an adhesive bandage, exposing several inches of the adhesive. Using even pull on both sides of the tape, stretch this exposed middle section up to 50% and apply evenly over the center of the low back in the area of the greatest pain. Apply the remaining portion of the decompression strip on both sides with just paper- off tension for the last couple inches to minimize pulling and discomfort. Rub the tape strip to activate the adhesive.

Photos showing the stretching and application of the decompression strip in the lumbar spine

VARIATIONS OF LOW BACK PAIN TAPING

As with any part of the body, there are many approaches to using RockTape based on the needs of the client and the experiences of the practitioner. Different sizes of tape can be used, more than one decompression strip can be applied, the length of the stabilization strips can be altered as needed, etc. There is no shortage of ways to tape any part of the body, the spine included, so FMT encourages practitioners to experiment and always look for the best way that suits the situation at hand.

The lumbar spine is perfectly suited, especially on larger clients, for the use of the 4-inch wide Big Daddy RockTape. It is particularly well suited for use as a decompression strip, as shown at the right. Big Daddy tape can also be used for the stabilization strips. Whether it is used for stabilization or decompression, simply use the 4-inch tape the same way you would apply 2-inch tape. It is more challenging to put even stretch across the center area of the 4-inch wide tape than it is with the standard width, however, so be sure to carefully stretch the decompression strips evenly across the entire width of the tape when using Big Daddy in your applications.

Another use of the 4-inch wide tape in the low back is to cut stabilization strips from it, then split those strips down the middle for 80-90% of the length of the strip, making a “V-cut” as shown below. This method fans the tape out in a way that covers more of the thoracolumbar fascia area, giving a different type of support/ sensory impact to this area than a single strip of 4” tape. This method can also be used with a 2-inch (shown) or 4-inch wide decompression strip focused over the area of greatest pain.

Photos showing Big Daddy cut into “V’s” for an alternate approach to taping the low back

NOTES

NECK PAIN TAPING APPLICATION

Simply by moving the strips of tape to the appropriate area of pain, the same framework shown for low back pain taping can be applied anywhere in the spine. If the patient complained of mid-thoracic pain, for example, simply apply two stabilization strips to the mid-thoracic area and a decompression strip, whether 2-inches or 4-inches wide, across the area of greatest discomfort.

The same approach applies to general neck pain, too. Be aware, however, that the skin in the cervical spine is sometimes more sensitive to taping. Neck hair as well as the patient's hairline is very sensitive to the stretch of tape (not to mention the adhesive!), so pay particular attention to avoid both as much as possible. The baroreceptors in the carotid arteries in the anterolateral neck could potentially be stimulated by RockTape's decompression effect, so also avoid taping over that area.

It is best to apply the decompression strip across the base of the neck, which avoids all of these problem areas. The photos below show the basic pain taping framework applied to the neck. As with the low back, flex the patient's chin toward their chest to stretch the posterior skin and fascia of the neck during the taping application.

Photos showing the basic framework for taping general neck pain

KNEE PAIN TAPING FRAMEWORK

Knee pain of all types can respond well to FMT taping applications. RockTape is ideal for using in areas like the knee because it can be contoured to fit each patient's individual anatomy, and its stretchiness makes it comfortable to wear and longer lasting than other types of tape. As with the spine, there are many ways to use RockTape around the knee. Experiment with 2-inch and 4-inch width tape as well as mixes of both, one or two decompression strips, as well as extending the tape into the musculature of the thigh to aid in muscle sequencing and force production, both of which are often part of many knee pain presentations. The basic knee pain taping framework, as with the spine, requires three strips of RockTape and is described below.

KNEE PAIN TAPING STEP-BY-STEP INSTRUCTIONS

- Measure two stabilization strips of 2" wide RockTape that will curve around the inside and outside of the knee, essentially surrounding the kneecap. Generally the first strip should be measured from the tibial tuberosity to the quadratus tendon area. Make one strip several inches longer than the other so that its anchors will end on skin and not over the other stabilization strip. Round the corners on both stabilization strips.

- Measure a decompression strip that will go across the knee, usually below the kneecap, again being sure that the strip is long enough to end on skin and not over the decompression strips, but also short enough that it avoids the sensitive skin behind the knee. Round the corners of the decompression strip.
- Stretch the tissues being taped by simply flexing the patient's knee to 90° during the taping application. This is the best position for most knee taping applications, although in some cases it may be beneficial to flex the knee further if they doing activities that require a larger range of motion (i.e. weightlifters working on deep squats).
- To apply the first strip remove the paper from one end of the tape and anchor the strip at the top or bottom ofthe knee area. Peel back most of the paper backing and, using paper-off-tension, use both hands to guide and curve the tape around the knee. Apply the second anchor with no stretch and then rub the tape to activate the adhesive.
- Repeat with the second, longer stabilization strip, curving it around the other side of the knee, and be careful to start and finish the anchors of the second strip on skin rather than on top of the first strip.
- For most knee pain complaints the patellar tendon is more tender than the quad tendon, but center the decompression strip over the area of greatest pain as much as possible. Break the paper backing of the decompression strip in the middle and peel the paper back to expose the middle section. Stretch it approximately 50% and apply the decompression strip over the patellar tendon just below the kneecap. Finish the anchors with paper-off tension and rub the strip to activate the adhesive.

Photos showing the basic application of the FMT knee pain framework with decompression of patellar tendon

NOTES

VARIATIONS OF KNEE PAIN TAPING APPLICATIONS

As stated, it may be beneficial to alter the position of the decompression strip when taping the knee. Other times using longer strips and extending them into the lateral, medial and/or anterior thigh can benefit the patient, particularly if muscle timing/sequencing or and/or force production problems are suspected. This latter application can be done with one very long strip of RockTape or split between two strips as with the standard application. Big Daddy tape can be split into a “V” with the closed end being applied over the tibial tuberosity (or in the thigh musculature, as shown below) with the arms of the V wrapping around the knee. The advantage of doing this is having less tape overlap at the anchors and in many cases it seems to stay applied longer than a standard three-piece application. There are many possibilities when taping the knee and, again, the results of each taping application should be gauged by the patient’s response, durability of the tape, range of motion and comfort of the patient.

LOWER EXTREMITY TAPING APPLICATIONS

In addition to the knee taping applications previously mentioned, RockTape can be used effectively for all manner of ankle and foot pain applications. Whether taping the Achilles tendon, iliotibial band, shin splint pain, using RockTape to help with the pain from a sprained ankle, or in the case of plantar fasciitis, the goal of care is to lend some stability to the area without robbing the taped region of its range of motion. In cases where swelling is present, as in the example of a sprained ankle, focus your efforts on controlling the edema first, then transition to more pain and stability-oriented frameworks after the swelling is under control. The mere fact that the tape is on the patient's skin means that there will be a pain-gate effect via the stimulation of sensory receptors in the skin, so all RockTape applications should have some degree of pain control even if that isn't the point of the tape application at that stage of the injury.

Like the hands, the skin of the feet presents challenges to taping applications because of the heat generated by footwear as well as the general tendency toward moisture and the mechanical wear of the tape during weight bearing. Unless the person has previous experience taping their feet during sporting events, it is advisable not to tape a client's feet before a competition or timed training session as the tape can roll up or peel back easier due to the heat, moisture and mechanical wear. Having to stop in the middle of a running race, CrossFit workout, or any other sporting event would not endear the client to your efforts, so it is best to experiment with foot taping procedures on competitive patients when there is less on the line.

As with the upper extremity, the two-piece taping framework for pain (one stabilization strip and one decompression strip) is easily applicable to most problems outside of the knee.

NOTES

PLANTAR FASCIITIS PAIN TAPING STEP-BY-STEP

Our example for the lower extremity pain taping framework involves a taping application for the common foot problem of plantar fasciitis. This example utilizes the two-piece basic pain taping framework used throughout this section of the Study Guide:

- Measure a stabilization strip of 2-inch wide RockTape from the heel to the base of the toes on the affected foot and round the corners off.
- Measure a decompression strip of 2-inch wide RockTape around the circumference of the patient's midfoot, accounting for 2 to 3 inches of overlap for the second anchor. Round the corners.
- To stretch the plantar fascia and bottom of the foot, have the patient dorsiflex their ankle as much as possible as well as extend the toes back as much as they can.
- Apply the stabilization strip with paper-off tension to the bottom of the foot from the base of the toes to the heel. The direction of application does not matter. Rub the strip to activate the adhesive.

- The decompression strip for the foot is applied slightly differently than for most other pain applications since the tape will wrap around the circumference of the foot and you do not want to create a sense of constriction for the client. In this case, expose one end of the decompression strip and apply it to the dorsal aspect of the midfoot. Using paper-off tension, wrap the tape laterally to the outside of the foot, then continue under the foot still using paper-off tension on the tape. Once the tape has reached the navicular ridge of the navicular bone, apply 50% stretch for approximately 2 inches until the tape has again wrapped to the top of the foot, then finish the rest of the strip with paper-off tension. Rub the tape to activate the adhesive.
- If needed, you can cut another strip of tape and repeat the last step to create a second decompression strip to over

Photos showing the FMT pain taping framework applied to a patient with plantar fasciitis

ADDITIONAL LOWER EXTREMITY PAIN TAPING APPLICATIONS

Below are examples of the FMT pain taping framework applied to other areas of the lower extremity.

Photos showing FMT framework applied to Achilles tendonosis

FMT pain taping applied to calf pain

Photos showing FMT pain taping and stabilization for an ankle sprain

NOTES

UPPER EXTREMITY PAIN TAPING

Taping for pain in the upper extremity is very popular for shoulder problems, but can also be used for elbow conditions and into the wrist and hand. The studies referenced previously for kinesiology taping of the upper extremity primarily involve the shoulder, probably because of how common shoulder pain and dysfunction is. These studies show changes in pain levels, range of motion, strength and sequencing/timing are all possible with the use of kinesiology tape like RockTape. Pain has an immediate effect on the quality of movement in the body and since many shoulder problems are rooted in dysfunctional scapulothoracic and glenohumeral joint motion patterns, RockTape can be particularly effective for use in the acute, as well as rehabilitation portions of care for the shoulder.

As with the knee, RockTape is wonderfully suited for use in the shoulder because the tape needs to flow over each patient's unique contours as well as stretch enough to allow full range of motion. Also like the knee, the basic taping framework for shoulder pain uses three strips of 2-inch wide tape, although 4-inch tape can be used in much the same way (split down the middle most of the way to make a "V") as it was around the knee. 2-inch RockTape is generally used in the elbow, forearm and wrist areas, as well as for some hand applications (i.e. using RockTape to protect the hand during barbell or pull-up bar movements during a CrossFit competition). When taping the fingers themselves 1-inch tape is best to use, and keep in mind that if you don't have 1-inch tape at your disposal you can simply cut strips to that width from wider rolls of tape.

Outside of the shoulder, the basic two-strip FMT pain framework works well for most applications. One strip would run the length of the area being taped (while that area is being lengthened, of course) while the other would serve as a decompression strip over the area of greatest pain. The axilla, inside of the arm and crease of the front of the elbow are all sensitive zones, so make sure you make every effort to keep tape out of these areas. Because of the quality of the skin itself as well as the available range of motion, taping the palm of the hand and the palmar surfaces of the fingers can present a challenge for tape to stick, even when using RockTape.

BASIC UPPER EXTREMITY PAIN TAPING STEP-BY-STEP

The following example shows the step-by-step process for taping a basic upper extremity pain complaint, in this case lateral epicondylitis, or "Tennis Elbow:"

- Measure a stabilization strip that extends from the lower triceps area to mid-forearm that will cross over the lateral epicondyle. Use Big Daddy tape on very large patients, although 2-inch width tape is generally acceptable to be used on most people. Round the corners of the stabilization strip.
- Measure a decompression strip that will be centered over the lateral epicondylitis, being sure to plan for placement of this strip so that it doesn't irritate the sensitive skin inside the "hinge" of the elbow joint. Round the corners of the decompression strip.
- Stretch the lateral/posterior skin and fascia of the affected forearm by having the patient flex their wrist.
- Anchor one end of the stabilization strip in the lower triceps area, then use paper-off tension and place the rest of the strip extending into the forearm, being sure to cover the lateral epicondyle area at the elbow. Rub the tape to activate the adhesive.
- Break the paper of the decompression strip and expose the middle portion of RockTape. Stretch the strip evenly approximately 50% and apply the stretched center portion over the lateral epicondyle/ epicenter of pain. Finish the ends of the tape with paper-off-tension being sure not to stretch the anchors of the decompression strip. Rub the strip to activate the adhesive.

Photos showing the basic FMT pain framework as applied to lateral epicondylitis

This framework can easily be applied to patients with medial epicondylitis, carpal tunnel syndrome, general elbow or wrist pain, etc, and even into the fingers as shown below. Simply stretch/lengthen the area being taped and apply the stabilization and decompression strips as previously discussed.

Photos showing the basic FMT pain framework as applied to lateral epicondylitis

NOTES

SHOULDER PAIN TAPING STEP-BY-STEP

The basic framework for taping the shoulder is similar to the knee, with two stabilization strips surrounding the shoulder area and a decompression strip focused over the area of greatest pain, usually the top of the glenohumeral joint area or across the acromioclavicular joint. As with the knee, there are many variations that can be used when taping the shoulder using a variety of sizes of tape as well as targeting various muscle groups, like the upper trapezius, rhomboids, latissimus dorsi, or over the scapula itself. The basic framework for taping the shoulder for pain is as follows:

- Measure two stabilization strips that will start on the upper shoulder/trapezius area and end around the bottom of the deltoid muscle. As with the knee, measure one strip longer than the other so that the anchors can end on skin. Round the corners of these stabilization strips.
- Measure a strip for decompression at the area of greatest pain. Be sure to avoid the sensitive skin in the axilla and medial upper arm and also try to plan the decompression strip placement so that its anchors avoid ending on the stabilization strips. Round the corners of the decompression strip.
- Taping of the shoulder requires stretching both the front and back of the shoulder while the respective stabilization strips are applied. To stretch the posterior shoulder structures, have the patient reach across the front of the body and hold that position while applying the stabilization strip. As with the knee it doesn't matter which direction this strip is applied in. Anchor the strip at the top of the shoulder and use the paper and both hands to apply it to the posterior shoulder area with paper-off tension, contouring around the back of the shoulder. Finish the anchor with no tension on the tape. Rub the strip to activate the adhesive.

- To apply the second stabilization strip, stretch the front of the shoulder by having the patient place the arm in their lower back area. Start the second strip on skin in the upper shoulder area and contour it around the front of the shoulder, avoiding the axillary area, finishing the second anchor with no tension on the tape. Rub the RockTape strip to activate the adhesive.

- The decompression strip for general shoulder pain is usually applied across the top of the shoulder in the AC joint area. Break the paper on the decompression strip at the middle and expose the center of the tape. Stretch the decompression strip approximately 50% and apply it over the top of the shoulder. Finish the anchors with no stretch and rub the strip to activate the adhesive.

VARIATIONS OF FMT SHOULDER PAIN TAPING APPLICATIONS

A simple 2-strip shoulder application

AC joint stabilization with three decompression strips

Shoulder support with scapular stability taping

NOTES

The mechanism of the Symptomatic Glide Test includes several hypotheses. Gliding the skin may create a strain pattern in the skin or underlying connective tissues that has a greater effect on the sensory stimulation and therefore, the afferent/efferent balance that both downregulates pain and alters muscle function and control of range of motion around a joint. This strain may create a beneficial mechanical effect that the tape can support, as well. Other possible mechanisms include the stimulation of Golgi tendon organs and/or mechanoreceptors in the muscles as well as other complicated reflexive nerve activity as proposed by Pollard in his paper about the mechanism of motor changes from directional pressure in the abdomen.[18]

Symptomatic Glide Test applied to the low back

Regardless of the mechanism, the Symptomatic Glide Test can be a useful adjunct to the FMT frameworks for pain taping. It is simple to perform and there is immediate feedback from the patient in a change in symptoms as the test is performed. To perform the SGT, simply use a light tugging motion on the skin over the symptomatic area to pull the skin in a particular direction. With the skin lightly pulled and held in a direction, ask the patient if their pain improves, or have the patient perform a range of motion and look for changes in the quality or range of movement as well as reduction of pain. Repeat the test several times using different directions of light pull on the skin. If you determine that the patient had a positive improvement with the skin being pulled in a particular direction, try putting 25-50% of stretch on the stabilization strip in that same direction as it is applied or change the direction of the decompression strip to run in that direction, whichever fits that area of the body better.

SGT applied to the shoulder

18 Pollard HP, et al. The ileocecal valve point and muscle testing: a possible mechanism of action. Chiropractic Journal of Australia. 2006; 36(4): 122-126.

NOTES

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SECTION 5

FLUID DYNAMICS TAPING

Decompression of skin and its underlying tissues is one of the primary effects of kinesiology tape. One of the results of this decompression effect is an improvement in fluid handling by the lymphatic system, which travels through the skin, fascia and other connective tissue layers.[19, 20] Improving fluid dynamics is beneficial both during acute injuries as well as during the recovery of strenuous exercise and training.

During the earliest phases of an injury, the lymphatic system can be overwhelmed by the inflammation that occurs in the damaged tissues. This results in swelling and while this inflammatory response is normal, and to a certain extent beneficial in healing from an injury there is a limit before it becomes a problem in its own right.

A secondary effect of FMT's approach to fluid dynamics taping is that the tape has a neurological effect that supports normal movement. The lymphatic drainage system of the body relies on an external pumping action to work optimally. This pumping effect comes from movement, and kinesiology tape promotes normal movement even in the acute phase of an injury. Having a patient able to move more effectively during the acute phase of an injury further enhances the body's ability to rid the injured site of inflammation via this pumping mechanism.

As you might expect, the effect of taping on lymphatic flow is dependent on the activity of the subject who is taped. For example, a study using kinesiology tape with rabbits showed no difference in lymphatic flow in taped vs. untaped subjects when they were not exercising. During exercise, however, there was a significant increase in lymph flow rates. In fact, the rate increased by 24-37% in the group who was exercising.[21]

Another exciting use of kinesiology tape is in post-mastectomy breast cancer patients. Because most mastectomies also involve the removal of significant lymphatic vessels that manage fluid in the upper extremity, it is common for patients to suffer from large amounts of swelling in the arm that is painful, affects muscle strength and coordination and is discouraging to patients. Traditional methods of treatment for this post-surgical problem include lymphatic drainage massage and wearing tight, uncomfortable and bulky compression bandages or sleeves.

19 Miller MG et al. A preliminary investigation onto the effect of kinesio and athletic tape on skin blood flow changes. Journal of Strength & Conditioning Research. 2011 doi: 10.1097/01.JSC.0000395668.82529.61

20 Bialoszewski D et al. Clinical efficacy of kinesiology taping in reducing edema of the lower limbs in patients treated with the ilizarov method - a preliminary report. Orthop Traumatol Rehabil. 2009; 11(1): 46-54.

21 Shim JY et al. The use of elastic adhesive tape to promote lymphatic flow in the rabbit hind leg. Yonsei Medical Journal. 2003; 44(6): 1045-1052.

In a study that compared the use of kinesiology taping to traditional compression wraps, the results were very positive and encouraging. The tape was found to be as effective as the compression wraps in decreasing the circumference of the affected limbs as well as the sense of fullness, hardness and other symptoms. In fact, the kinesiology tape group reported that six out of eleven symptoms improved (tightness, pain, hardness, discomfort, fullness, tingling) while the compression group only reported four symptoms as improving. Furthermore, the acceptance and compliance with using kinesiology tape was better than for the bandages and subjects reported that it was easier to use, more comfortable and allowed for more convenience in daily activities. The only negative effect noted was that the tape group had more wound occurrence than the compression bandage group and the authors thought that it could be due to the difficulty of properly removing kinesiology tape with one hand.[22]

METHOD

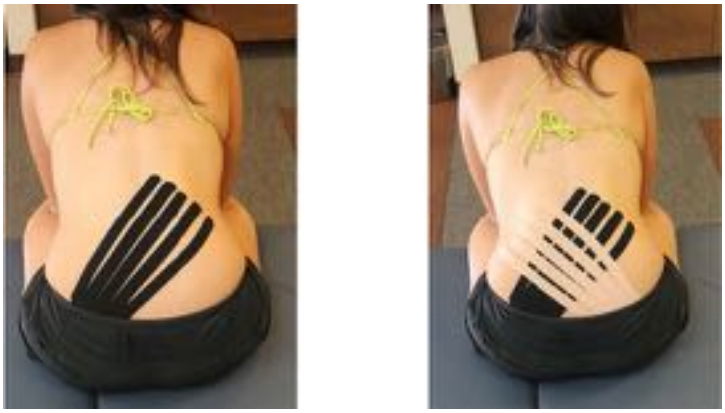
The general framework used in FMT for fluid dynamics taping is to create a crisscrossing network or "basket weave" of strips of RockTape. In the past it was thought that the direction of the strips, their length, and the direction they ran in as well as their placement over lymph vessels was critically important. This made the taping procedure cumbersome and difficult.

Experimentation in the field among FMT practitioners has led to a much easier approach as the key point in fluid dynamics taping is simply to create a decompression "basket" over the swollen area, promoting enhanced fluid handling. Contrary to past models of taping the tape itself does not seem to "shuttle" the fluid in any particular direction, so the direction of taping or placing anchors over lymph channels and other concepts does not seem to be important in the actual clinical use of kinesiology tape for this purpose. Fluid dynamics taping applications should be changed every 24 hours until the swelling is greatly improved.

22 Tsai HJ et al. Could kinesio tape replace the bandage in decongestive lymphatic therapy for breast-cancer-related lymph-edema? A pilot study. Support Care Cancer. 2009; 17:1353-1360.

- Cut two strips of RockTape (2” or 4” width tape can be used) that will cover the affected area of swelling. RockTape Pre-Cut Edema Strips can also be used to save a lot of time when doing fluid dynamics taping.
- If you are not using the Pre-Cut Edema Strips, cut “fingers” lengthwise into the strips of tape, leaving approx. 2” of one end of the tape uncut. These fingers should be approximately 1/2” in width (four fingers in a 2” width piece of tape)
- Place the anchor (uncut end) of one of the strips toward the periphery of the swollen area and then “fan out” the fingers of the tape so that they cover a good portion of the swollen area. Use paper-off tension for this taping application. Carefully rub the tape to activate the adhesive.
- Repeat this with the second strip of tape, placing it such that the fingers fan out in an alternating direction from the first strip and create a “basket” or decompression network over the swollen area. Also apply this “fan” with paper-off tension and rub the tape to activate the adhesive.

Pre-Cut Edema Strips



Photos showing fluid dynamics taping of the low back area

- If you are concerned about the fanned ends of tape rolling up or catching on clothing you can cover the fingers of tape with a 2” strip of RockTape to protect them.

ADDITIONAL EXAMPLES OF FLUID DYNAMICS TAPING

Photos showing post-mastectomy taping and upper extremity swelling taping (left to right)

Photos showing various approaches to fluid dynamics taping in the lower extremity

NOTES

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SECTION 6

POSTURE TAPING

Much of FMT Level 1 is about managing pain, swelling and range of motion loss in acute and chronic cases. The frameworks used in FMT are simple to understand and apply and they allow a high amount of customization for both the practitioner as well as the patient. In this section of the Study Guide we move into using RockTape for static posture.

Improving posture is a central theme in the practices of most manual therapists because loss of ideal posture represents a structural problem that affects stability, movement, joint mechanics and efficient muscle function. Posture is at the core of many pain syndromes, headaches, joint and muscle pain and can lead to acute and chronic injuries. Ultimately most manual therapists understand the need to deal with the underlying causes of a client's symptoms, dysfunctions, lack of performance, etc. and Fascial Movement Taping is an excellent adjunct in the rehabilitation phase of making postural improvements.

While it is easy to only think of posture in the context of static positions such as standing and sitting, it is important to expand your idea about how posture, or position, relates to movement and function. All movements have a beginning and ending position, and many have transitional positions interwoven throughout. Therefore, movement and posture are two sides of the same coin. Starting or ending a movement with suboptimal positioning will result in lack of optimal performance as well as possibly even injury. Consider the sport of weightlifting, for example, in which a shift in barbell path by even an inch can be the difference between success and failure in a lift. This same concept applies to most other sports and, to a less obvious but no less important extent, all activities of life. Seeing the result of poor positioning during movement is certainly more obvious when there is a fatigue, load or intensity (or all three!) as part of the equation, but tens of thousands of cycles of poor foot positioning during walking, for example, will be no less damaging to the patient.

While his work dealt with how people communicate through posture, gesture, stance and movement, anthropologist Ray Birdwhistell found that kinesthetic guidance (teaching someone through touching and movement) can translate to changes in behavior thirty times faster than visual guidance and thousands of times faster than auditory instruction.[23] This is why clients often have dificulty learning cor ective exercises, for example, from verbal instructions, but when pictures, videos or simply guiding the person's body through the movement are employed the person learns the exercise much faster.

RockTape can be used in much the same way to help with the correction of posture because it gives kinesthetic guidance to the body and can also be used to give feedback using tension, whether it is consciously noticed or not, to promote better positioning. Thedon's study on the degradation of posture due to muscle fatigue showed that simply using a small piece of tape on the Achilles' tendon was enough stimulation to improve quiet standing posture in fatigued individuals. The study concluded that "when the muscular sensory input flow normally relevant for the postural system is impaired due to fatigue, the weight of cutaneous information increases for the successful representation of movements in space to adjust postural control."[24] In other words, as the subjects became fatigued, their postural stability depended to a greater degree on the information coming to the brain from the skin.

23 Birdwhistell R. 1970. Kinesics and Context. University of Pennsylvania Press. Philadelphia.
24 Thedon T, et al. Degraded postural performance after muscle fatigue can be compensated by skin stimulation. Gait & Posture. 2011; 33:686-689.

Another study on children with cerebral palsy showed positive changes in sitting posture (head, neck and foot positions as well as arm and hand function), concluding “in clinical settings [kinesiology tape] may be a beneficial assistive treatment approach when combined with physical therapy.”[25]

Static Posture and position also relate to movement because they represent stability, or lack thereof, which is critical to the body’s movements. In the concept of regional interdependence, each region of the body has a predominantly stability or mobility function. Any alteration in this pattern creates not only problems for the local affected area, but also in remote areas that have to compensate for the pattern’s disruption. Gray Cook defines the following areas of stability and mobility in his book, Movement[26]:

- Foot - stability
- Ankle - mobility
- Knee - stability
- Hip - mobility
- Lumbopelvic region - stability
- Thoracic/cervical spine - mobility
- Scapula - stability
- Glenohumeral joint - mobility

When stable regions become overly mobile, or vice versa, they create compensations in other areas of the body. How often do patients present with hypomobile thoracic spines, forcing the scapulothoracic joint to be unstable and exhibit improper mechanics while the glenhohumeral joint compensates with a loss of mobility? Another common manifestation of the concept of regional interdependence is the patient with low back pain coming from hypermobility in the sacroiliac joints and hyperextension in the lumbar spine as they compensate for hips that do not fully extend. It’s no wonder manual therapists spend so much time trying to stabilize the core and lumbopelvic region, mobilize the hips and thoracic spine, etc. We, at Rock Tape, postulate that the application of tape on areas lacking in stability (motor control) we can help facilitate better control via the added kinesthetic guidance. Therefore, one of the key concepts in static postural taping, we typically apply tape in areas of motor control loss in order to regulate poor postural patterns. The movement side of this problem is explored in depth in FMT Level 2 training.

25 Simsek TT, et al. The effects of kinesio taping on sitting posture, functional independence and gross motor function in chil- dren with cerebral palsy. Disability and Rehabilitation. 2011; 33(21-22):2058-2063.
26 Cook G. 2010. Movement. On Target Publications. Aptos, California.

MULTIPLANAR POSTURAL ASSESSMENT

Most natural movements of the body are multiplanar, meaning they occur in multiple planes simultaneously. As such, it is crucial to assess posture, as well as movement, from all three body planes.

- Frontal/coronal plane: a vertical plane running from one side of the body to the other. Divides the body or its parts into an anterior (front) and posterior (back) portion.
- Sagittal plane: a vertical plane that runs from the back of the body to the front, dividing it or its parts into right and left sides.
- Transverse plane: a horizontal plane that divides the body or its parts into upper and lower parts.

Using a multiplanar assessment approach, the body's segments can be described in all three planes relative to other segments. These segments may translate and/or rotate upon the three axes (X, Y and Z) that these planes represent. Each segment can be described as having tilted, bent, rotated or shifted relative to another segment. Additionally, the curvatures o f the spine connecting the head, thorax and ribcage, and pelvis can be assessed using radiographic means for proper curvatures and load bearing.

While this all sounds complicated, it's simply a matter of careful observation of the client and how they carry themselves in space. In many cases postural distortions are obvious, but in other cases they can be difficult to see on first glance. Technology can be very helpful for this, as well as to keep an accurate record of the patient's presenting posture and changes that occur with your treatment.

Static postural assessment should be done from the front, back and sides and digital images can be captured for records as well as to show patients what their own structure is doing. Use the checkpoints of feet, ankles, knees, lumbopelvic hip complex, scapula/thoracic, cervical and upper extremity and assess each in all three planes, being sure not to neglect postural deviations in the transverse plane, which is often the hardest to see.

FMT POSTURAL TAPING FRAMEWORK

At first the postural taping concept can seem counterintuitive to some practitioners, but we will use a series of analogies to help you understand the concepts and apply them to a variety of postural presentations. To begin with, it is important to understand the using RockTape for postural correction is an aid to your entire corrective protocol. Making sure that mobile areas are mobile, stable areas are stable and that the patient has corrective exercises targeting their postural faults is critical to success in correcting posture. RockTape will not correct posture, it is simply an important aid to an overall corrective strategy and it needs to be used as such.

The best way to understand how to apply the postural taping framework is to imagine that the patient is completely covered in a suit made from wires that can pull the various parts of the body in any direction. These wires extend from the pelvis up into the shoulders and neck, as well as from the pelvis down into the legs, and they are found on the back, sides and front of the suit. Using this analogy, visualize which wires, as well as where they start and end, you would need to pull on in order to make the desired postural corrections. Essentially, tape will be placed in such a way that would mimic the actions of the fictitious wires. When you visualize postural taping this way, you will begin to notice that the strips of tape being used generally follow the fascial planes of the body. As the client falls into the unwanted posture they will receive a conscious or subconscious cue from the tape as it increases in tension, reminding them to return to a more desirable posture that places less tension on the tape.

Until now, with all of the FMT taping frameworks we have positioned the body area being taped in a lengthened position. For postural taping, the client is placed in the desired posture and the tape is applied while they maintain this posture. In addition, we are now taping a specific movement pattern, not a muscle (key FMT concept) in order to effect a dysfunctional position. The basic framework for FMT postural taping is as follows:

- Place the body into the position that is the opposite of the unwanted posture (but not overly exaggerated).
- Apply the stabilization tape along the fascial line(s) that will facilitate the intended posture (remember the wire suit example above).
- Apply the strip(s) of tape with paper-off tension or light to moderate stretch (it is usually best to use less stretch on the tape initially and then apply more with subsequent taping applications if needed).

Of course, postural taping can be coupled with pain and edema frameworks. Postural taping usually uses long, low-stretch strips of RockTape, so they are essentially long stabilization strips. If you are trying to decrease pain as well as affect posture, simply use decompression strips over the postural tape in the areas of pain.

CERVICOTHORACIC FMT POSTURAL CONTROL TAPING APPLICATIONS

The basic postural faults that practitioners will notice in this region are forward head posture, slumped and rounded shoulders, internal rotation and/or unleveling of the shoulders. Of course, many variations and combinations can present themselves when observing posture, so use these descriptions as guidelines and be ready to modify the framework as needed for each individual client.

Begin with positioning the patient in the opposite (neutral posture), but not exaggerated, of their unwanted posture. For the majority of the cervical and thoracic presentations, the easiest posture to utilize is Bruegger's position: spine neutral, scapulas retracted toward the spine and toward the floor, palms forward and chin retracted so the ear is in line with the AC joint. Most of the time when asked to adopt a specific postural position clients will exaggerate the desired posture, so a good strategy is to have them overemphasize both the desired as well as the unwanted postures and ask them to "meet in the middle" and this is often the ideal posture for taping. If needed, simply position the patient where you want them and then apply the tape.

Photos showing a typical cervicothoracic postural taping application with a decompression strip (red) for pain

In the above series of photos the client has rolled shoulders and forward head posture. The patient is placed in Bruegger's position, but because of his musculature in the upper back it creates a deep furrow in between the shoulder blades. In such a case, have the patient relax their posture, adhere the tape to the skin between the shoulder blades, then finish the ends of the tape while they maintain Bruegger's position. Otherwise the tape would pull too much and wouldn't likely stick once the client relaxed his posture.

In this case an "X-pattern" is used from the inferior scapula to opposite lower neck on both sides with a decompression strip for pain across the lower neck. This pattern creates some pull across the shoulders when the client slumps the shoulders forward and he will also experience some tension in the neck as his head drops forward. This taping application could be worn for 3-5 days and the patient would have a prescription for performing upper body postural exercises such as banded Bruegger's exercises and pectoralis stretches as one example.

Photos showing an FMT application for rolled shoulders and scapular instability using Big Daddy RockTape

The next example, above, shows an alternate method for more severely rolled shoulders. In this case the tape strips anchor on the front of the shoulder and cross to the lower angle of the scapula. This creates more pull across the back as the shoulders roll forward into the unwanted posture, cueing the patient to stand with his shoulders in a more retracted and neutral position. It will also help him to stabilize his shoulder blades during arm movements. A variation of this application is shown below using 4-inch wide Big Daddy tape.

Photos showing an FMT postural application for more severely rolled shoulders and scapular instability

NOTES

Another simple approach is to use a strip of Big Daddy tape across the midscapular region. As the patient's shoulders roll forward, there will be increased tension between the shoulder blades, cueing the patient to maintain a more neutral upper thoracic posture.

A concept emphasizing the fascial planes can also be applied to posture, as shown below. In this case, long strips of tape have been applied from the base of the neck to the sacroiliac area. This affects the entire posterior chain of the torso, which is beneficial for more upright posture as well as for helping with thoracic extension in sport movements such as front squats. This approach is less focused on the region of poor posture and more on the underlying fascial anatomy.

Pelvic tilt is another common postural problem seen in many patients. It can affect muscle balance and activity in the legs and trunk as well as the ability to maintain a stable core in exercise as well as standing posture. Force closure of the sacroiliac joints can also be compromised by pelvic tilts and torsions. Pelvic tilt mechanically shifts weight bearing in the lumbar spine and sacroiliac joints and contributes to both hyperlordotic and hypolordotic lumbar curvatures.

Photos showing a fascial concept applied to postural control using longer strips of RockTape

Using the “wire suit” visualization is helpful to understand the pelvic tilt taping framework. As with the postural taping framework already described, when taping for pelvic tilts position the patient in the desired neutral pelvic position and then tape with light to moderate tension. For anterior pelvic tilt, anchor a strip of RockTape to the anterior superior iliac spine and extend it back to the opposite lower ribcage. This can be done unilaterally or bilaterally depending on the patient’s presentation. As the patient’s pelvis rotates into its familiar position of anterior pelvic tilt, the tape will have increased tension and will cue the patient to maintain a more neutral pelvic position.

Photos showing FMT taping for anterior pelvic tilt correction

The taping method for increased posterior pelvic tilt is to tape from the posterior superior iliac spine and extend the tape into the front of the lower ribcage as pictured below. This will create tension on the tape as the patient goes into posterior tilt and will cue them to stand with a more neutral pelvic position. As with the anterior tilt taping, this can be done bilaterally or unilaterally as indicated.

Photos showing FMT taping for posterior pelvic tilt correction

The FMT framework for scoliosis patients again adopts a more fascial approach. In the photos below the patient has an elevated shoulder with significant anterior rolling of the left side. Using the “wire suit” analogy, pulling down on the shoulder would improve the elevation while pulling a wire from the right iliac crest to the left shoulder would help bring the shoulder back and into alignment with the pelvis in the transverse plane. As the photos show, tape is applied in exactly those configurations.

There are many other ways to use RockTape and FMT frameworks to help patients with scoliosis. As with other postural taping approaches already shown, taping is only part of an overall corrective strategy. Even for patients with curvatures that are past being correctable there is value in using RockTape because the tape can help normalize muscle tone and can give the patient relief from some of the muscle fatigue and pain associated with this condition.

In pitching and other throwing applications, both chains may be taped as shown above to support acceleration in the throw and aid the deceleration phase with the intrinsic stretch and snapback properties of RockTape. An alternate method of supporting both chains that is particularly effective in cases where the upper extremity has excessive internal rotation is to use a spiral pattern. To apply an upper extremity spiral taping method, first position the client in a palm forward arm position. Begin with anchoring the tape at the front of the wrist then begin applying it in a lateral and superior direction, spiraling around the arm (ideally “catching” the medial elbow and avoiding the sensitive skin in the crease of the elbow), up into the posterior shoulder and upper trapezius area as shown to the right .





NOTES

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SECTION 7

DIAPHRAGM TAPING APPLICATION

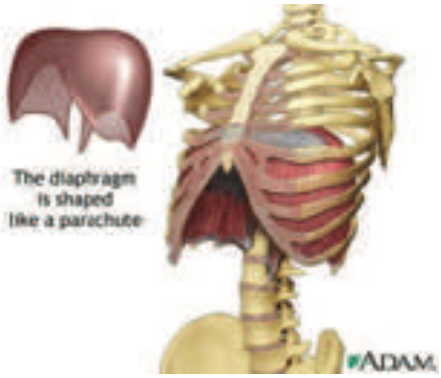
The Performance Core Chain includes deep muscles of the lower extremities, abdomen, spine, neck and jaw and is primarily involved with stabilizing the body in all positions and movements as well as respiration. Respiratory conditions, dysfunctional postural patterns, low back pain, knee pain, headaches and foot and ankle disorders (particularly overpronation of the feet) can all be attributed to a dysfunctional Performance Core Chain. The muscles and structures included in this myofascial chain are:

- Temporalis and masseter
- Scalenes and hyoid muscles
- Longus colli and capitus
- Diaphragm
- Transverse abdominis
- Iliacus and psoas
- Quadratus lumborum
- Pelvic floor muscles
- Adductors of the thighs
- Posterior tibialis
- Flexor hallicus longus and flexor digitorum longus

The Performance Core Chain functions to stabilize the pelvis and spine for all movements in all positions in addition to breathing. Coordinating breathing with strength movements such as Olympic weightlifting and powerlifting serves an important secondary purpose for the diaphragm as it helps create abdominal pressure that stabilizes the spine during these lifts. Virtually every movement and position that the human body is capable of requires coordination and stability of the Performance Core Chain.

Proper alignment of the ribcage and pelvis helps to normalize length and tension relationships between the pelvic floor and diaphragm. This is critical for optimal breathing as well as creating centration to allow for optimal core activation during movement. As such, posture, breathing and sequencing of core muscles are all integrated functions of the Performance Core Chain and need to be addressed by taping strategies.

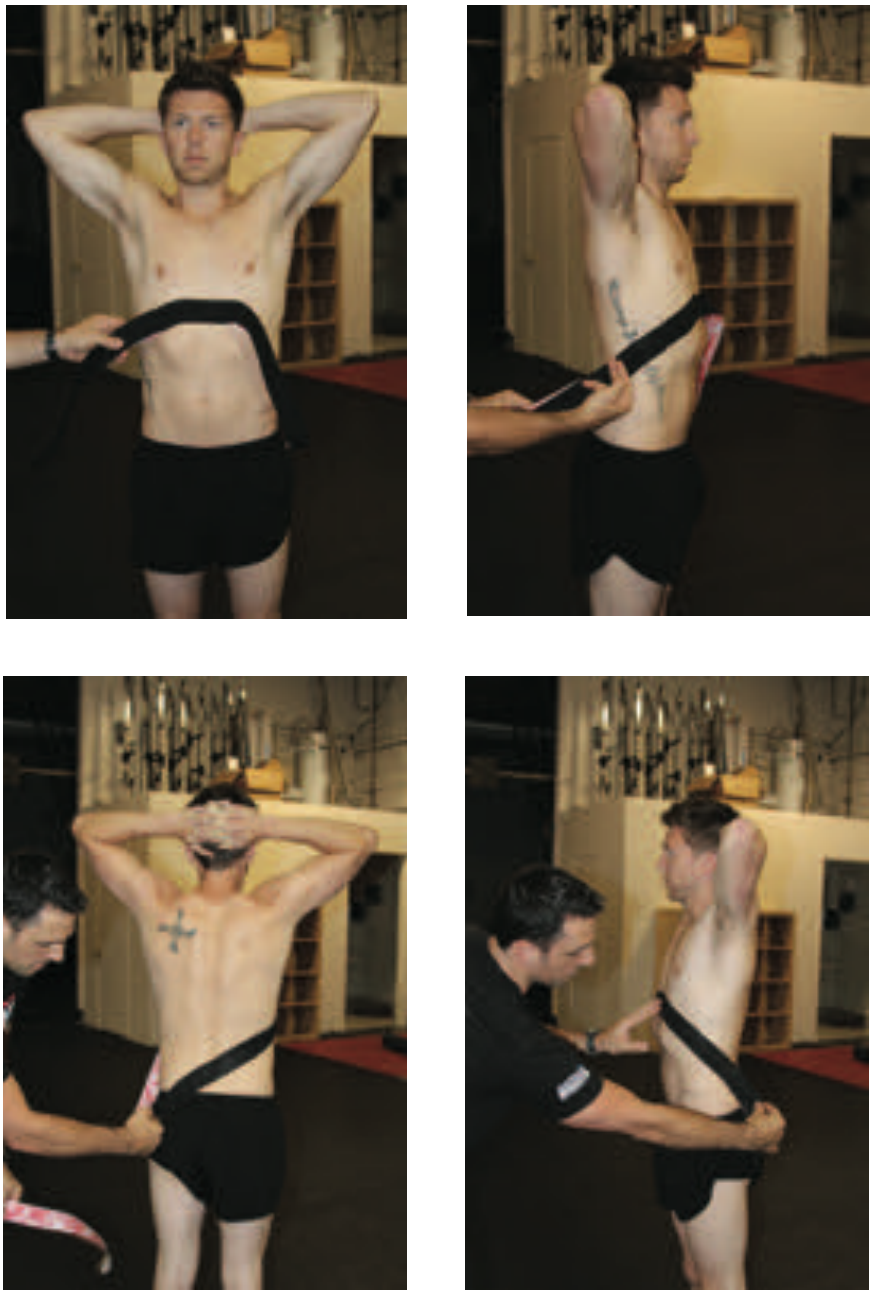
Abdominal expansion occurring before chest movement



Diaphragm and ribcage anatomy

Taping of the entire Performance Core Chain

The entire Performance Core Chain may be taped with one long piece of RockTape, however a more common approach is to tape the diaphragm and transverse abdominal area in a spiral-like fashion to help give feedback to chest wall and abdominal expansion during breathing exercises. There are many strategies to “resetting” the diaphragm from traditional yoga breathing patterns and abdominal control movements to biofeedback methods or novel approaches like having patients inflate balloons while lying supine in a flexed hip position to activate the diaphragm.



To tape the diaphragm, measure a strip of RockTape from the xiphoid process of the sternum following the lower edge of the ribs and costal cartilage, around the lateral abdomen and across the lumbodorsal fascia to the opposite hip area, then double the length. Find the center of the strip of tape and apply it to the xiphoid process area, with the patient's arms upraised, and as they rotate their body apply the tape with no additional stretch following the pattern described above. Repeat on the other side.

NOTES

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SECTION 8

NERVE ENTRAPMENT

Nerve tract irritation is an unfortunately common condition in a manual therapy practice. These irritations and the resulting pain can come from central spinal causes such as disc lesions or other space occupying lesions and intervertebral foraminal encroachment as well as from peripheral entrapments. In either case, there is direct or indirect compression of the nerve and mechanical irritation, which results in ischemia, inflammation, alteration in nerve transmission and sensitization of the nerve.

FMT attempts to mitigate these symptoms by decompressing the myofascial system through which the nerve tract travels. The desired outcomes include normalized axonal transportation and nerve conduction, reduction of pain and nerve-related symptoms, and ultimately regeneration and repair. Walsh published a case report of using exercise and kinesiology tape with significant benefit in a child's brachial plexus injury[27] while another case study of a patient with radial nerve entrapment syndrome described benefits from kinesiology tape noticed in the first session that were maintained six months later.[28] While many more larger studies need to be conducted, there is certainly some support in the literature for the use of RockTape in nerve pain cases.

The basic FMT approach to neuro taping utilizes a single long strip of tape that begins at the spine or most proximal entrapment site and follows the affected nerve distally through as much of its length as possible. When performing neuro taping, the nerve that is affected should be lengthened through stretching and the tape should be applied with paper-off tension. Neuro taping should be coupled with treatments that will reduce the nerve entrapment, including manual methods as well as neuromobilization or "nerve flossing" techniques.

The photos below show the position for taping a brachial plexus radiculitis. The arm is extended back, the wrist is extended and the neck is rotated away from the affected side, then the tape is applied to follow the nerve.

27 Walsh SF. Treatment of a brachial plexus injury using kinesiotape and exercise. Physiotherapy Theory and Practice. 2010; 26(7): 490-496.

28 Anadkumar S. Kinesio tape management for superficial radial nerve entrapment: a case report. Physiotherapy Theory and Practice. 2013 Apr; 29(3): 232-241.

Likewise, a similar strategy would be employed for a sciatica patient. The patient dorsiflexes the foot, keeps the knee straight and flexes at the hip to lengthen the sciatic nerve/posterior leg. Tape is applied with paper-off tension from the spine to the toes.

Photos showing FMT neuro taping for a client with sciatica

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SECTION 9

SCAR TAPING

Scars present an interestingly unique source of myofascial pain and the use of RockTape is an effective tool in the management of the associated symptoms, as well as the source of the problem. As early as the 1930's physicians were routinely injecting Novocain and other substances into and around scar tissue, reporting unexpected and often amazing results. According to Karel Lewit, MD active scars present an interruption in the strain patterns in the soft tissues that accompany all movements, resulting in impaired motor function. Lewit also explains that a scar is not always a superficial entity and that it may extend down many layers of tissue, adhering to organs and even bone. He further explains that some layers of a scar may be active while others are normal and not causing problems, so it is important to use treatment methods that identify and target different layers of scar tissue. Lewit reports success in the manual treatment of scars in dozens of cases over the more recent years of his career. [29]Lewit goes into detail about a particular case in another pape[30] and scar treatment should be an important part of practice for manual therapists.

Steve Middleton, MS, ATC, CSCS, CES, CKTP, FMT explains the use of RockTape in the treatment of scars as follows:

> "Scar tissue" tends to be a general term for any type of soft tissue restriction or shortening. This term is often inappropriately applied to any type of myofascial adhesion. Authentic scar tissue demonstrates changes in the histological presentation, typically having more densely organized collagen fibers. This occurs when there is tearing, either partial or complete. This may occur due to an accident or surgery.
>
> Normal tissue is typically arranged in lines along a given line of movement (figure 1). After an injury, the body lays down large amounts of collagen to both heal and re-enforce the damaged tissue (figure 2). The body tries to strengthen the area to prevent this type of injury from re-occurring. However, the large amount of collagen is rapidly placed and may not be placed in an orderly or viable arrangement.
>
> Manual therapy techniques such as instrument assisted soft tissue mobilization and myofascial release are designed to prevent the formation of cross-linkages between the scar tissue and the surrounding normal tissue. If cross-linkages have already been made, these same manual therapy techniques can often reverse this process. Passive, static stretching after these treatments can also be beneficial in both lengthening the tissue and encouraging it to align into a beneficial movement pattern.
>
> Another adjunctive therapy is kinesiology taping with RockTape. The application of this adhesive, cotton elastic tape can greatly alter scar tissue formation. The tape is typically applied with the base either medial or lateral to the incision with the application applied towards the midline with 100% tension through the end of the tape (figure 3). This applies shearing forces through the scar to pull and soften the tissues. The strips are alternated down the length of the incision. This is especially beneficial after the manual therapy techniques to encourage alignment with the least restrictions of motion (figure 4).

29 Lewit K and Olsanska S. Clinical importance of active scars as a cause of myofascial pain. Journal of Manipulative and Physiological Therapeutics. 2004; 27:399-402.

30 Kobesova A and Lewit K. A case of a pathogenic active scar. Australiasian Chiropractic and Osteopathy. 2000 Mar; 9(1);17-19

Typical treatment guidelines state that treatment of the scar must not begin before 6 weeks post-injury. This ensures proper integrity of the scar. However, peri-scar treatments can be utilized immediately after surgery to limit the area of keloid formation.

Figure 1

Figure 2

Figure 3

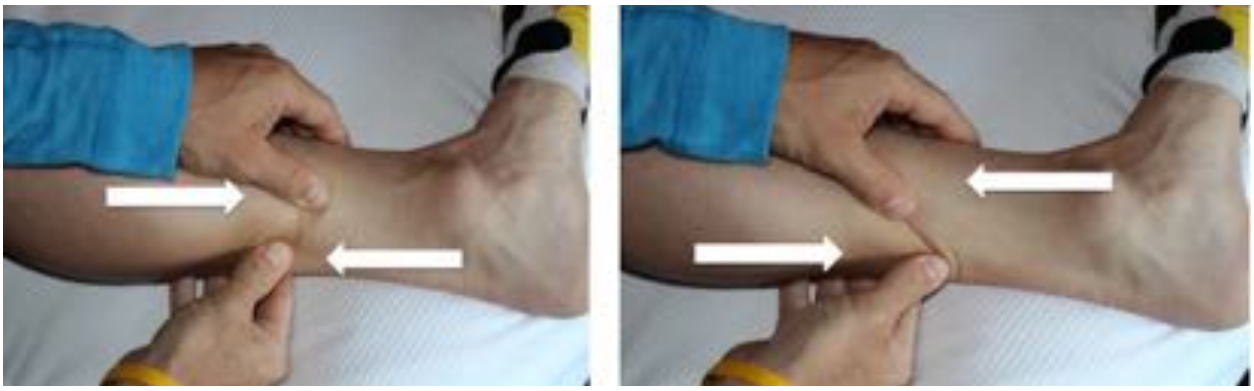
Figure 4

The basic goal of scar tissue taping using RockTape is to introduce micro-shearing and a “massage” effect into all layers of the scar to encourage alignment of the tissues. It is important to not tape over a scar for six weeks post-injury, but the tissue adjacent to a scar can be taped immediately. In the earliest phase of care for scars RockTape can be used for edema control, but again, the scar itself needs to be avoided until it is healed.

SCAR TISSUE ASSESSMENT

Once the scar has healed, assessment should be performed to test the quality of the tissue of the scar itself as well as the skin surrounding it. Observe for redness and swelling, palpate for the presence of pain, edema and the overall quality of the scar tissue and surrounding skin and finally use a tissue glide assessment in many directions around the scar to assess the quality of movement and the presence of “barriers” to soft tissue motion in the area.

The scar should be supple and move in all directions with equal quality, but it is common to find restrictions or barriers to the movement quality in certain directions. These barriers are the direction the RockTape strips will be applied in order to encourage movement and the realignment of the scar tissue with the rest of the skin in the area.



Photos showing scar motility assessment and the presence of a motion barrier in certain vectors

FMT SCAR TISSUE TAPING FRAMEWORK

Each scar is different and as it is treated with manual methods the best application of RockTape will change over the course of the treatment plan. Assessment is very important as the taping method you use can change on a visit-to-visit basis. It is important to note that RockTape should never be used over open wounds/incisions and that they should be fully closed for at least two weeks before tape should be applied over scars. General guidelines recommend not beginning treatment of a scar until six weeks after the injury, as well, so make sure enough time has gone by before commencing treatment on the closed, fully healed scar. Also exercise caution when using RockTape on scars with patients who are diabetic or have venous insufficiency or peripheral neuropathy. The basic scar tissue framework is as follows:

- Assess the scar tissue for pain, swelling, redness, heat and motility.

- Cut a series of RockTape strips that will extend into the normal skin on both sides of the scar while also crossing over it. Depending on the size of the scar these strips will most likely need to be thinner than the standard 2-inch tape. 1-inch or even narrower strips may be appropriate to use on a scar, so use appropriate sized tape and round the edges of all the pieces as with any other taping application.
- The idea behind this tape application is to create varying amounts of pull in different directions over the course of the scar so as to have a micro-massage/shear effect through the full depth of the scar tissue. You will want to place the pieces of tape so that they pull the tissue in the direction of the soft tissue motion barriers you encountered in the assessment. Anchor one end of a tape strip and pull with moderate tension (up to 50%) in the direction of the barrier, laying down the second anchor with paper- off tension.
- Repeat this step in various directions and with varying amounts of stretch on the remaining pieces of tape. The patient should keep the tape application for 3-5 days and then it should be reassessed upon each visit with new tape applied, often in different directions if the assessment dictates it.

Photos showing edema control taping around new wounds. Note that the tape avoids all open wound tissue

Photo showing alternating strips of RockTape on healed scar

NOTES

APPENDIX 1: RECOMMENDED READING

1. Capobianco S and van den Dries G. Fascial Movement Taping Manual. 2012
2. Myers TW. Anatomy Trains: Myofascial Meridians for the Manual and Movement Therapists (2nd Edition). Churchill Livingstone. 2009.
3. Schultz R and Feitis R. The Endless Web. North Atlantic Books. 1996.
4. Sahrmann SA. Diagnosis and treatment of movement impairment syndromes. St. Louis: Mosby, Inc.; 2002
5. Stecco L and Stecco C. Fascial Manipulation – Theory and Practical Parts. PiccinNuovaLibraria. 2009
6. Schleip R et al. Fascia - The Tensional Network of the Human Body. Churchill Livingstone. 2012.

APPENDIX 2: HOME CARE INSTRUCTIONS FOR PATIENTS/CLIENTS

Below is a sample document you may want to adapt for use in your practice. It is recommended to use at events where you may be taping, as well, and you should develop a waiver form to be used in addition when you are taping people at events to limit your liability in the rare likelihood of problems. It is best to contact your own malpractice/ liability insurance carriers for further instruction in waiver forms and taping at events where a full examination cannot be performed.

The application of RockTape will support the goals for your care that we've established at [INSERT NAME OF PRACTICE HERE]. Unless you have been instructed otherwise by _____, you should try to keep the tape applied for five days. There is no advantage to leaving it applied longer than five days, so please remove the tape after the 5th day of wearing it.

- If at any time the skin around the tape becomes inflamed, itchy, red or the tape causes discomfort, carefully remove it and please contact _____ for further instruction.
- The adhesive is waterproof and the tape is cotton and nylon and "breathes" well. Showering/ bathing, as well as swimming, with the tape on is no problem, but be careful to pat the tape dry with your towel and not rub over the edges of the tape, causing the tape to peel.
- Likewise, be careful pulling clothing on/off over the tape because catching the edges of the tape with clothing will also cause the edges to start to lift up. If you have tape on your feet or ankles/lower legs, for example, roll your socks on so you don't lift the edges.
- If the edges of the tape start to lift carefully use scissors to trim the excess off.
- When you remove the tape, work slowly and pull the tape in the direction that any body hair beneath it runs. If any adhesive is left behind a shower and soap will usually remove it. If the tape is firmly adhered or the adhesive residue is resistant to removal in the shower, soak the tape or adhesive residue with baby oil for a few minutes to break down the adhesive, then try to remove it.

APPENDIX 3: USING ROCKTAPE AT SPORTING EVENTS

Many practitioners will use RockTape as a sideline treatment during sporting events or in conjunction with promotional events at races, CrossFit competitions and other events. These events do present some challenges to the practitioner because they are not ideal conditions under which to assess and tape clients, but good preparation before the event can mitigate many of the problems that can occur.

- Bring copies of your waiver forms as well as home care instructions for the athletes you tape. Keep the signed waiver form for your own records and it is recommended you collect each athlete's name, address and phone number as well as date of birth.
- It takes about 60 minutes for RockTape adhesive to really adhere to clean, dry skin, so whenever possible arrive early and tape athletes as long before their event as possible. When this isn't possible tell the athletes that the tape won't stick as well as it normally would because of the lack of time.
- Taping sweaty athletes or warmed-up athletes is very challenging because moisture on the skin will prevent the RockTape from adhering well. Once it is adhered, moisture isn't as big of a problem, but getting tape to stick to already wet skin is a different story. Bring rubbing alcohol and towels to dry and clean the athlete's skin as much as possible before taping. The RockSauce topical ointment can help clean and prep athlete's skin, too, but also creates a significant warming effect, so use it judiciously, sparingly and always avoid sensitive skin areas.
- Avoid taping feet in most cases as the skin of the feet present challenges under ideal circumstances. You do not want an athlete to be uncomfortable during an event or have to stop to take their shoes and socks off to remove tape that is rolling up and irritating them.
- Hand taping to protect the palms and fingers from barbells, kettlebell handles, pull-up bars and ropes is popular at CrossFit events. Again, the hands are challenging to tape, but RockTape works very well to help protect the hands in these circumstances. Advise athletes to use liberal amounts of chalk rubbed into the tape and hands, otherwise the tape will shift, slide and pull during the event.

The popularity and use of kinesiology tape (k-tape) has increased dramatically over the last seven years. Despite the fact that it was invented in the 1970's by Dr. Kenzo Kase, k-tape rose to prominence following the Beijing Olympics in 2008. K-tape is increasingly being used by athletes at all levels, ranging from Olympians to weekend warriors. While k-tape's popularity continues to grow, there is still significant debate about k-tape's clinical efficacy. This is due in part to the historical beliefs of many practitioners who cling to out-dated and unsupported theories about the purported benefits of k-tape. At Rocktape, we are committed to furthering the body of scientific knowledge on the effects of k-tape and to demonstrating the positive benefits that we see clinically every day. We are actively supporting research that is currently being conducted around the world, and we promote "evidence –informed" education in all of our courses. As emphasized by Sackett et al[31], we understand that evidence-based practice relies not only on the scientific literature, but also on the clinical experience of the provider and patient expectations (Figure 1).

Figure 1. Evidence based approach to rehabilitation[31]

The Centre for Evidence Based Medicine (CEBM) encourages clinicians to make decisions based on the best evidence available.[32] High levels of evidence on the effects of k-tape as specified by the CEBM are lacking… While systematic reviews and meta-analyses, among the highest levels of evidence, do exist, they are divided in their conclusions… Additionally, a lack of high quality reviews stems from a lack of high quality individual studies on the effects of k-tape. As such, the literature remains divided on its efficacy.

Regardless of literature available, it has become clear that some of the original beliefs about k-tapes are simply not grounded in science… Most notably is the idea that the direction in which the tape is applied results in facilitatory or inhibitory effects on the targeted muscle… Vercelli et al[33] compared the effects of no tape, origin to insertion tape, and insertion to origin tape on quadriceps strength and limb performance in healthy individuals… They found that there were no differences between groups with regard to strength or performance.[33] This finding support the common sense view that direction of application does not play as great a role in performance improvement as simply have tape on the skin does.

31. Sackett DL, Staruss SE, Richardson SW, Rosenberg WM, Haynes R. Evidence-based medicine: How to practice and teach EBM. 2nd ed. Wiley Online Library; 2000.
32. Centre for evidence-based medicine. What We Do Web site. http://www.cebm.net/what-we-do/. Updated 2014. Accessed December 22, 2014.
33 Vercelli S, Sartorio F, Foti C, et al. Immediate effects of kinesiotaping on quadriceps muscle strength: A single-blind, placebo-controlled crossover trial. Clin J Sport Med. 2012;22(4):319-326.

Another commonly held belief about the application of k-tape is that a large amount of tension is needed to elicit a response. However, studies that utilized sham, or placebo, k-tape application, indicate that this is not the case… It is important to note that, with regard to the k-tape literature, "sham" refers to the application technique and not to the tape itself. Gonzalez-Iglesias et al[34] compared the effects of traditional k-tape application to a sham application on neck pain and range of motion in individuals with whiplash. They found that these measures improved significantly regardless of the amount of stretch applied to the tape.[34] Additionally, Thelen et al[35] compared the effects of k-tape application and sham tape on shoulder pain, disability, and pain free range of motion in individuals with shoulder impingement. They found that both k-tape and sham improved pain and pain free range of motion.[35] These findings suggest that, once again, tension does not appear to be as important as cutaneous stimulation in improving outcomes.

Currently, it is unclear if the effect of k-tape application on the muscle are excitatory or inhibitory, as studies show conflicting results. It is possible that k-tape may have different effects on different muscle groups.
For example, Lumbroso et al6 compared the effects of k-tape on the gastrocnemius and on the hamstring on force production. They found that KT showed an immediate, significant, and sustained (two days post-application) increase in force production in the gastrocnemius group.[36] While there was no immediate effect of k-tape on force production in the hamstring, following two days of application force increased significantly as well.[36] And while Wong et al[37] showed no change in peak torque production of the quadriceps with the application of k-tape, they did show that quadriceps with k-tape were able to achieve peak torque more quickly compared to a no tape condition. Chen et al[38] investigated the effects of k-tape application on vastus medialis oblique and vastus lateralis activation during stair descent in individuals with knee pain. They found that both muscles had had earlier onset activation, which suggests that k-tape improves functional control during stair descent when compared to controls without tape.[38] It is important to note the, despite these findings, results among studies still conflict.

It is theorized that injured individuals and individuals in pain have distorted sensory awareness of the affected body part and, in some cases, in the contralateral limb. It is theorized that by stimulating the mechanoreceptors in the skin and subcutaneous tissue, k-tape may provide the brain with additional input regarding the body's position in space, thereby making the wearer more cognizant of the taped area. In individuals with chronic low back pain, Bae et al[39] found that k-tape in conjunction with usual care resulted in a better pattern of abdominal muscle recruitment compared with pre-treatment measures. Additionally, Parreira et al[40] found that regardless of the technique of application, k-tape was helpful in reducing pain and disability in individuals with chronic low back pain. This effect was even somewhat maintained eight weeks

34. González-Iglesias J, Fernández-de-Las-Peñas C, Cleland JA, Huijbregts P, Del Rosario Gutiérrez-Vega M. Short-term effects of cervical kinesio taping on pain and cervical range of motion in patients with acute whiplash injury: A randomized clinical trial. J Orthop Sports Phys Ther. 2009;39(7):515-521.
35. Thelen MD, Dauber JA, Stoneman PD. The clinical efficacy of kinesio tape for shoulder pain: A randomized, double-blinded, clinical trial. J Orthop Sports Phys Ther. 2008;38(7):389-395.
36. Lumbroso D, Ziv E, Vered E, Kalichman L. The effect of kinesio tape application on hamstring and gastrocnemius muscles in healthy young adults. J Bodyw Mov Ther. 2014;18(1):130-138.
37. Wong O, Cheung R, Li R. Isokinetic knee function in healthy subjects with and without kinesio taping. Phys Ther Sport. 2012;13(4):255-258.
38. Chen P, Hong W, Lin C, Chen W. Biomechanics effects of kinesio taping for persons with patellofemoral pain syndrome during stair climbing. 4th Kuala Lumpur International Conference on Biomedical Engineering. 2008;21:395-397.
39. Bae S, Lee J, Oh K, Kim K. The effects of kinesio taping on potential in chronic low back pain patients anticipatory postural control and cerebral cortex. J Phys Ther Sci. 2013;25(11):1367-1371.
40. Parreira PdCS, Costa LdCM, Takahashi R, et al. Kinesio taping to generate skin convolutions is not better than sham taping for people with chronic non-specific low back pain: A randomised trial. J Physiother. 2014;60(2):90-96.

after the treatment ceased.[40] Griebert et al[41] showed that k-tape can have a positive effect on biomechanics in individuals either with or prone to medial tibial stress syndrome, or shin splints. K-tape application in this group improved their foot loading patterns as they walked across a force plate, yet the same application made no difference to a control group with normal biomechanics.[41] These findings highlight one of the most exciting developments with regard to k-tape: the powerful effect that the tape may have on correcting abnormal movement patterns and postures.

It may also be the case that healthy, asymptomatic individuals, who are often subjects in k-tape research, are less likely to show an effect from taping. This may be because any additional input to the brain the tape provides could be quickly dismissed as unimportant since the system is not compromised. In states of pain or fatigue when the system is compromised, it is possible that additional afferent input may be considered more meaningful. This may result in a positive effect on efferent output. For example, Thedon et al[42] compared the effects of two conditions (control and k-tape) applied to the Achilles tendon on standing balance before and after exercise to fatigue. While subjects demonstrated similar sway patterns before fatigue, they swayed significantly less in the k-tape condition following fatigue.[42] The authors surmised that individuals preferred to use their muscle spindle input when this input was reliable.[42] However, when muscle spindle input was degraded through fatigue, the brain utilized information provided by the k-tape on the skin, which results in better standing balance compared to the control condition. Similarly, Konishi[43]compared quadriceps strength before and after the application of k-tape following fatigue. He found that subjects had greater quadriceps strength with the k-tape condition compared to baseline.[43] There were no differences in strength before fatigue for no tape and k-tape conditions. [43] Cortesi et al[44] found that standing balance improved in subjects with multiple sclerosis who had their Achilles' tendons taped. These findings support the notion that tape can provide substantial improvements in balance in individuals with compromised sensory input. Supplementary information applied to the cutaneous mechanoreceptors k-tape may help improve outcomes.

The exact physiological mechanism of action for k-tape remains unknown. While many studies have investigated the effect of k-tape on various parameters, such as pain, inflammation, muscle function, and joint position sense, there is very little research on how it may alter these parameters. In a recent, unpublished study from the US, researchers used ultrasound imaging to show that k- tape does have a lifting effect on the subcutaneous tissue layers. By imaging and comparing pre- and post-tape applications, researchers demonstrated a visible change in the interstitial space. This early finding is in line with the long- held belief that k-tape's mechanism of action is partially achieved through decompression of local tissues. Clinically, this may be the reason we often see dramatic changes in the reduction of swelling and in the reduction of hematomas with k-tape application. This lifting effect creates convolutions on the skin that may potentially decompress the lymphatic vessels and allow exudates to be removed from the area more easily. The same lifting effect is also thought to improve circulation to the area, allowing ecchymosis to be cleared more efficiently. Finally, the lifting effect may simultaneously decrease the pressure on the superficial nociceptors and stimulate the mechanoreceptors, leading to less perception of pain in the

41. Griebert MC, Needle AR, McConnell J, Kaminski TW. Lower-leg kinesio tape reduces rate of loading in participants with medial tibial stress syndrome. Phys Ther Sport. 2014:epub ahead of print.
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underlying tissue. All of these factors combined may allow injured individuals to return to proper form and function more quickly. Research seems to support this idea as it relates to inflammation. Tsai et al[45] demonstrated k-tape application in conjunction with usual therapy was equally effective with regard to control of breast cancer related lymphedema when compared with traditional short stretch bandaging and usual therapy. Additionally, subjects with k-tape displayed greater compliance, decreased difficulty in use, and greater self-reported comfort compared with subjects with the short stretch bandages.[45] These findings suggest that k-tape may be a valuable tool in the management of lymphedema. In this study, it provided similar benefits to short stretch bandaging over a one month period and was associated with greater patient comfort.

Improvements in circulation may also result in improvements in Delayed Onset Muscle Soreness (DOMS) demonstrated in a study by Bae et al.[46] They found that DOMS symptoms resolved faster in individuals with k-tape application compared to a sham tape control group. Tsai et al[47] investigated the effect of k-tape application on pain and plantar fascia thickness in individuals with plantar fasciitis. The k-tape group showed a significantly greater reduction in pain scores compared to controls. More interestingly, the k-tape group demonstrated a significantly greater reduction in the thickness of the plantar fascia at the insertion site as measured by a blinded ultrasonographer compared to controls. Additionally, Karwacinska et al[47] showed a positive effect of k-tape application in children with hypertrophic and keloid scarring over a twelve week period. The reduction in scarring may also be suggestive of changes in circulation to the taped area and also to the benefits of low threshold skin shear on a scar over long periods of time. These findings suggest that k-tape allows for an increase in circulation that facilitated tissue remodeling.

FUTURE DIRECTIONS FOR KINESIOLOGY TAPING RESEARCH

There is much to do regarding further research into the effects of kinesiology taping.

- To begin, we need small, well designed efficacy trials to further define what needs investigating in future larger, randomized controlled studies.
- We need large, randomized controlled studies to validate the findings of recent, smaller pilot studies. These smaller studies include those that have demonstrated decreases in subjects' pain, improvements in performance, and reductions in the negative performance effects of fatigue.
- We need to determine the optimal length of time of application of the tape. There have been some interesting findings, such as by Lumbroso et al[36] previously described. They found an immediate increase in excitability of the gastrocnemius in healthy individuals following k-tape application and a delay in a similar excitability in hamstrings. Many studies have not found significant benefits from immediate k-tape application, but have not re-tested 24-48 hours late. It is possible that the tape has a delayed effect resulting from slow adapting mechanoreceptors. Kaya et al[48] compared physical therapy with either the use of modalities or k-tape in individuals with shoulder impingement with regard to pain and disability. They found that pain in the k-tape group decreased significantly more than pain in the modality group after the first week of treatment.[48] Following two weeks of treatment, the k-tape group had significantly lower disability than the modality group.[48] These findings indicate that pain decreased first and that functional scores improved later. A delayed effect may have

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implications for methods of future studies.

- The effect of k-tape in certain populations needs further study. There have been some interesting case studies published on the effects of k-tape in individuals with cerebral palsy investigating the effect of various taping techniques on function; however, larger, randomized studies could follow.
- Further research should be done to build upon early positive findings of the effects of k-tape on inflammation and lymphedema management. This area of study should be expanded to investigate the application of k-tape on inflammation resulting from orthopedic injury, surgery, and high intensity exercise.
- Can k-tape play a role in the prevention of injuries through improved neuromuscular control? Many studies have identified risk factors for certain injuries that could be addressed with taping. For example, Cameron et al[49] studied the hamstring muscle group in Australian Rules football. They postulated that hamstring injuries could occur through errors in position sense during foot contact with the ground while running.[49] Some studies into k-tape have demonstrated improved position sense or force sensse in taped subjects, including those by Chang et al[50]. It would be interesting to know if k-tape has benefits in athletes prone to hamstring injuries. Greg Myer's group out of Cincinnati Children's hospital has produced numerous papers looking at the risk factors for ACL injuries and patellofemoral pain in adolescent girls. The main risk factor identified by these studies is the valgus collapse that often occurs in landing and cutting actions.[51]This is the result of decreased hamstring recruitment and poor trunk control leading to increased hip adduction and internal rotation.[51] The effect of spiral taping of the lower limb would be interesting in this group of female athletes identified as having high risk for ACL rupture or patellofemoral pain.

There is much work to be done before k-tape can be considered as having a rigorous basis in evidence. However, it is often said that the lack of evidence does not constitute evidence of lack. Anecdotally, practitioners around the world continue to see benefits in their patients following k-tape application. It may be that we as clinicians need to avoid being blinded by old theories about k-tape's mechanism of action and embrace the role of the central nervous system in pain and movement disorders before we can truly understand the role of this family of tapes.

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