



PERFORMING ARTS

SPECIAL INTEREST GROUP



ORTHOPAEDIC SECTION
AMERICAN PHYSICAL THERAPY ASSOCIATION



American Physical Therapy Association
The Science of Healing. The Art of Caring.

PASIG MONTHLY CITATION BLAST: No.34

September 2008

Dear PASIG members:

PASIG President, Leigh Roberts DPT, OCS would like to announce that an exciting performing arts' first is happening in the APTA's consumer publication, "For Your Health." The cover of the 2008 issue that is released in October features two women - popular electric violinist, Caryn Lin, and her physical therapist. Please be sure to share this magazine with your patients and referral sources!

As everyone is catching up this fall following vacations and other summer activities, I hope you will make a note to yourself to vote in the upcoming PASIG and Orthopaedic Section elections. As you do so, drop an e-mail note to one of our PASIG Board members. We'd like to know what you're up to.

By now acceptances for CSM posters and platforms have been sent out. Please don't forget, the PASIG sponsors an annual student research scholarship. This award is to recognize students, who have had an abstract accepted to CSM, for their contribution to performing arts research. For more information on the research award please check our webpage (www.orthopt.org/sig_pa.php). The deadline for application is November 15, 2006. For more information, contact Scholarship Chairperson, Leigh Roberts, at Lar@LarPT.com, phone 410-381-1574 / fax 410-381-5174.

This summer and fall, many of us have been busy conducting pre-season screening of both professional and student dancers. With more and more dance screenings occurring throughout the country, to all of you out there I continue to pose this question: How can we move forward in this area with musicians and orchestras? I got no response last year, but I'll keep trying!

September's Citation BLAST continues our special topic series: "*Kinesio Tape*". The format is an annotated bibliography of articles on the selected topic from 1996 – 2006. As always, each month's citations will be added to EndNote libraries available on the PASIG webpage for our members to access and download. (Information about EndNote referencing software can be found at <http://www.endnote.com>, including a 30-day free trial). If you'd like to suggest a topic or create one, please let me know.

Please write to me with your comments and suggestions. If you're seeking a research mentor, looking for a sounding board about a research idea, want some editorial suggestions on a manuscript, let me know and I'll try to connect you with the right researcher. Entry contributions to these Citation Blasts or other PA research ideas are always welcome.

As always, please drop me an e-mail anytime.

Regards,
Shaw

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Kinesio™ Tape

As I watched the Olympic competitions last month, I was intrigued to see Kinesio™ tape worn by several athletes, including volleyball gold medalist, Kerri Walsh. Various news casters and bloggers described the tape as increasing blood flow through the muscles, assisting lymphatic drainage, giving support like a flexible brace, facilitating weak muscles with neurological awareness or proprioception, or providing pain relief. Spurred by the coverage that the taping was given, I selected this as our September annotated bibliography.

According to one website (<http://www.scienceofsocceronline.com/2008/08/cutting-edge-research-effectiveness-of.html>), "Kinesio™ tape is designed to give support and stability to the joints and muscles without affecting circulation and range of motion. The tape is made of an elastic woven tape that allows it to stretch 30-40% from its resting length, in order to simulate the elastic properties of skin. The theory is that it lifts the skin away from the muscle fascia, facilitating blood flow and drainage of fluids by the lymph system. The advantage of the tape is that it can be worn for long periods of time, for days or even weeks."

Unfortunately, a literature search in Medline, CINAHL, and AHMED found little to substantiate these claims. While there is evidence that taping in general (McConnell taping, athletic tape, etc.) may have some effect on patella femoral pain, plantar heel pain, etc., Kinesio™ tape has not been shown to be any more effective than traditional taping or no treatment. At \$15/roll, it is a costly alternative.

Performing artists, like athletes will try anything to improve their performance or game, and hence, are very susceptible to the placebo effect. Until we have strong, blinded, peer reviewed research, there is little scientific support for the use of Kinesio™ tape. Please judge for your selves.

Fu TC, Wong AM, et al. (2008). Effect of Kinesio taping on muscle strength in athletes-a pilot study. J Sci Med Sport **11**(2): 198-201.

Muscle strength is a key component of an athlete's performance and may be influenced by taping. This study examined the possible immediate and delayed effects of Kinesio taping on muscle strength in quadriceps and hamstring when taping is applied to the anterior thigh of healthy young athletes. Fourteen healthy young athletes (seven males and seven females) free of knee problems were enrolled in this study. Muscle strength of the subject was assessed by the isokinetic dynamometer under three conditions: (1) without taping; (2) immediately after taping; (3) 12h after taping with the tape remaining in situ. The result revealed no significant difference in muscle power among the three conditions. Kinesio taping on the anterior thigh neither decreased nor increased muscle strength in healthy non-injured young athletes.

Halseth T, McChesney JW, et al. (2004). The effects of Kinesio taping on proprioception at the ankle. J Sports Sci Med **3**: 1-7.

An experiment was designed to determine if KinesioTM taping the anterior and lateral portion of the ankle would enhance ankle proprioception compared to the untaped ankle. 30 subjects, 15 men, 15 women, ages 18-30 participated in this study. Exclusion criteria: Ankle injury < 6 months prior to testing, significant ligament laxity as determined through clinical evaluation by an ATC, or any severe foot abnormality. Experiment utilized a single group, pretest and posttest. Plantar flexion and inversion with 20° of plantar flexion reproduction of joint position sense (RJPS) was determined using an ankle RJPS apparatus. Subjects were barefooted, blindfolded, and equipped with headphones playing white noise to eliminate auditory cues. Subjects had five trials in both plantar flexion and inversion with 20° plantar flexion before and after application of the KinesioTM tape to the anterior/lateral portion of the ankle. Constant error and absolute error were determined from the difference between the target angle and the trial angle produced by the subject. The treatment group (KinesioTM taped subjects) showed no change in constant and absolute error for ankle RJPS in plantar flexion and 20° of plantar flexion with inversion when compared to the untaped results using the same motions. The application of KinesioTM tape does not appear to enhance proprioception (in terms of RJPS) in healthy individuals as determined by our measures of RJPS at the ankle in the motions of plantar flexion and 20° of plantar flexion with inversion.

Jaraczewska E, Long C (2006). Kinesio taping in stroke: improving functional use of the upper extremity in hemiplegia. Top Stroke Rehabil **13**(3): 31-42.

The purpose of this article is to present the Kinesio taping method used to improve the upper extremity function in the adult with hemiplegia. The article discusses various therapeutic methods used in the treatment of stroke patients to achieve a functional upper extremity. The only taping technique for various upper extremity conditions that has been described in the literature is the athletic taping technique. In this article, some interpretation is offered on proper assessment of the nonfunctional upper extremity, including the emphasis on postural alignment, trunk control, and scapula alignment. The Kinesio taping method in conjunction with other therapeutic interventions may facilitate or inhibit muscle function, support joint structure, reduce pain, and provide proprioceptive feedback to achieve and maintain preferred body alignment. Restoring trunk and scapula alignment

after the stroke is critical in an effective treatment program for the upper extremity in hemiplegia.

Liu YH, Chen SM, et al. (2007). Motion tracking on elbow tissue from ultrasonic image sequence for patients with lateral epicondylitis. Conf Proc IEEE Eng Med Biol Soc **2007**: 95-8.

In this study, Kinesio Tape(R) is used in patients with lateral epicondylitis. The ultrasonic image sequences of elbow are recorded dynamically, and then motion tracking is applied to assist in understanding the effect of the therapy. Motion tracking, based on optical flow method, is used to track certain landmark on the ultrasound image, which is very ambiguous, for estimating the motion of muscle. Hierarchical block tracking technique is proposed to perform this task. The motions with and without Kinesio Taping are compared and can be used as quantitative indicators for the treatment. The experimental results show that Kinesio Taping makes the motion of muscle on the ultrasonic images enlarge. It means that the performance of muscle motion gets improve.

Murray H, Husk L (2001). Effect of Kinesio taping on proprioception at the ankle, J Orthop Sports Phys Ther **31**: A-37.

PURPOSE: Determine if strips of elastic tape across the ankle enhance proprioception compared to no tape or white athletic tape. **INTRODUCTION:** A decrease in ankle proprioception as been linked to injury such as ankle sprain. Previous research has produced mixed results with regards to effects of tape/braces on proprioception. White athletic tape is used primarily for mechanical support/stability, but may enhance proprioception via mechanoreceptors (Simoneau et al.. 1997). **SUBJECTS:** 26 subject, 11 female and 8 male, ages 20-49 participated. Normal ligamentous stability of dominant ankle. **Exclusion criteria:** Current ankle injury, significant foot deformity. **METHODS:** Single group, repeated measures design; random presentation of conditions and target angles. Tape application according to the Kase method of Kinesio Taping for ankle sprain; 2" wide strip of Kinesio Tex tape applied to skin over anterior and lateral leg compartments. **Testing apparatus:** Lido Active isokinetic machine with electrogoniometer as part of equipment, dynamometer set at W/sec, axis of rotation just inferior to lateral malleolus. **Target joint angle replication:** 26" and 10" of plantar flexion, and 8' of dorsiflexion. 3 minute rest interval between each test condition to reduce possibility of carry-over and practice effect. **Condition:** No tape, Athletic tape. Kinesio Tex tape. **Data Analysis:** Absolute differences between target/reference angle and each replication for each condition. Values added to form deviation scores for each condition at each of the test angles. Scores compared using repeated measures ANOVA for each of the 3 angles. **RESULTS:** No significant differences in ankle joint replication at 26" plantar flexion or 8" dorsiflexion. Kinesio Tex tape condition significantly different at 10' plantar flexion, $p < 0.05$. No significant differences between tape conditions, previous dominant lower extremity injury or current activity level for any joint position tested. $p > 0.05$. **CONCLUSIONS:** Kinesio Tex taping improved proprioceptive abilities in normal subjects in a nonweight-bearing position. Region of facilitation appears to be in mid-range where ligament mechanoreceptors are normally quiescent. **CLINICAL RELEVANCE:** Return of normal proprioception after ankle sprain is a major goal of rehabilitation. Enhanced proprioception imparted by an elastic tape such as Kinesio Tex tape may facilitate this return, especially in view of the results of this study in which there was an apparent enhancement of proprioceptive ability in the mid-range or loose-pack position of the ankle joint.

Slupik A, Dwornik M, et al. (2007). Effect of Kinesio Taping on bioelectrical activity of vastus medialis muscle. Preliminary report. Ortop Traumatol Rehabil **9**(6): 644-51.

BACKGROUND: Kinesio Taping is currently regarded by physiotherapists as a method supporting rehabilitation and modulating some physiological processes. It is employed e.g. in orthopaedics and sport medicine. This sensory method supports joint function by exerting an effect on muscle function, enhancing activity of the lymphatic system and endogenous analgesic mechanisms as well as improving microcirculation. The aim of the study was to determine the effect of Kinesio Taping on changes in the tone of the vastus medialis muscle during isometric contractions. **MATERIAL AND METHOD:** The study group included 27 healthy persons. A Kinesio Tape was placed to support the function of the medial head of the quadriceps muscle of thigh. Transdermal EMG was used to assess bioelectrical activity of the muscle. A standardised protocol was employed for measurement of muscle tone, recorded as the peak torque of the muscle. **RESULTS:** An examination performed 24 hours after the placement of the Kinesio Tape revealed significantly increased recruitment of the muscle's motor units, as expressed by peak torque. An examination performed after 72 hours of kinesio taping showed a statistically significant increase in bioelectrical activity of the muscle. However, this was lower than the effect at 24 hours. In the group where the tapes were removed after 24 hours, high torque was still maintained. **CONCLUSIONS:** 1. Clinically significant effects of Kinesio Taping in this study included an increase in the bioelectrical activity of the muscle after 24 hours of kinesio taping and the maintenance of this effect for another 48 hours following removal of the tape. 2. The decrease in muscle tone to the baseline value, which was observed during the fourth day of Kinesio Taping use, may have resulted from the time of effective use of the KT tape being shorter than previously believed and may restrict Kinesio Taping use. 3. Kinesio Taping used shortly before the motor activity it is supposed to support may fail to fulfil its function.

Thelen MD, Dauber JA, et al. (2008). The clinical efficacy of kinesio tape for shoulder pain: a randomized, double-blinded, clinical trial. J Orthop Sports Phys Ther **38**(7): 389-95.

STUDY DESIGN: Prospective, randomized, double-blinded, clinical trial using a repeated-measures design. **OBJECTIVES:** To determine the short-term clinical efficacy of Kinesio Tape (KT) when applied to college students with shoulder pain, as compared to a sham tape application. **BACKGROUND:** Tape is commonly used as an adjunct for treatment and prevention of musculoskeletal injuries. A majority of tape applications that are reported in the literature involve nonstretch tape. The KT method has gained significant popularity in recent years, but there is a paucity of evidence on its use. **METHODS AND MEASURES:** Forty-two subjects clinically diagnosed with rotator cuff tendonitis/impingement were randomly assigned to 1 of 2 groups: therapeutic KT group or sham KT group. Subjects wore the tape for 2 consecutive 3-day intervals. Self-reported pain and disability and pain-free active ranges of motion (ROM) were measured at multiple intervals to assess for differences between groups. **RESULTS:** The therapeutic KT group showed immediate improvement in pain-free shoulder abduction (mean +/- SD increase, 16.9 degrees +/- 23.2 degrees ; P = .005) after tape application. No other differences between groups regarding ROM, pain, or disability scores at any time interval were found. **CONCLUSION:** KT may be of some assistance to clinicians in improving pain-free active ROM immediately after tape application for patients with shoulder pain. Utilization of KT for decreasing pain intensity or disability for young patients with suspected shoulder tendonitis/impingement is not supported. **LEVEL OF EVIDENCE:** Therapy, level 1b-.

Yasukawa A, Patel P, et al. (2006). Pilot study: investigating the effects of Kinesio Taping in an acute pediatric rehabilitation setting. Am J Occup Ther **60**(1): 104-10.

OBJECTIVES: The purpose of this pilot study is to describe the use of the Kinesio Taping method for the upper extremity in enhancing functional motor skills in children admitted into an acute rehabilitation program. **METHOD:** Fifteen children (10 females and 5 males; 4 to 16 years of age), who were receiving rehabilitation services at the Rehabilitation Institute of Chicago participated in this study. For 13 of the inpatients, this was the initial rehabilitation following an acquired disability, which included encephalitis, brain tumor, cerebral vascular accident, traumatic brain injury, and spinal cord injury. The Melbourne Assessment of Unilateral Upper Limb Function (Melbourne Assessment) was used to measure upper-limb functional change prior to use of Kinesio Tape, immediately after application of the tape, and 3 days after wearing tape. Children's upper-limb function was compared over the three assessments using analysis of variance. **RESULTS:** The improvement from pre- to posttaping was statistically significant, $F(1, 14) = 18.9$; $p < .02$. **CONCLUSION:** These results suggest that Kinesio Tape may be associated with improvement in upper-extremity control and function in the acute pediatric rehabilitation setting. The use of Kinesio Tape as an adjunct to treatment may assist with the goal-focused occupational therapy treatment during the child's inpatient stay. Further study is recommended to test the effectiveness of this method and to determine the lasting effects on motor skills and functional performance once the tape is removed.

Yoshida A, Kahanov L (2007). The effect of kinesio taping on lower trunk range of motions. Res Sports Med **15**(2): 103-12.

The purpose of the study was to determine the effects of kinesio taping (KT) on trunk flexion, extension, and lateral flexion. Thirty healthy subjects with no history of lower trunk or back issues participated in the study. Subjects performed two experimental measurements of range of motion (with and without the application of KT) in trunk flexion, extension, and right lateral flexion. A dependent t test was used to compare the range of motion measurements before and after the application of KT. Through evaluation of the sum of all scores, KT in flexion produced a gain of 17.8 cm compared with the non-kinesiotape group ($t(29)=2.51$, $p<0.05$). No significant difference was identified for extension (-2.9 cm; $t(29)=-0.55$, $p>0.05$) or lateral flexion (3 cm; $t(29)=-1.25$, $p>0.05$). Based on the findings, we determined that KT applied over the lower trunk may increase active lower trunk flexion range of motion. Further investigation on the effects of KT is warranted.
