

*Effects of Kinesio Taping on Posture and Presence
of Upper Extremity Pain*

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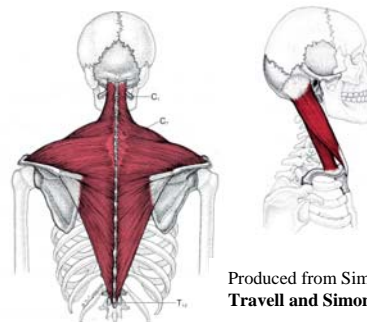
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Cumulative trauma disorder is a not-uncommon diagnosis associated with pain, paresthesias and reports of weak muscles in the upper extremity of workers of both genders. Other terms describing the constellation of signs and symptoms associated with CTD include overuse, repetitive strain, repetitive use, overuse disorder, overuse syndrome and so forth. The majority of the complaints associated with CTD involve structures located in the distal distribution of the median nerve, although frequently there are also descriptions of weakness of the entire upper extremity, or pain involving the neck, shoulder or entire extremity. Often there are complaints of moderate to severe headache, dizziness or even limited motion in the neck and shoulder as well. Although less common, pain at the medial wrist or hand presents in another region of the distal extremity, but in this case the disturbance involves the distribution of the ulnar nerve.

Mackinnon and Novak (1994) proposed that the pathogenesis of many of the symptoms associated with CTD actually could be the assumption of abnormal postures, positions or movements of the head, neck and upper extremity during work-related activities. Maintenance of these postures for hours / days at a time may then cause shortening in anteriorly located neck muscles such as the scalene and sternocleidomastoid muscles. Additionally, there is also concomitant shortening of the posteriorly positioned neck muscles, ie., upper trapezius and levator scapulae, with lengthening of the middle and lower trapezius muscles. A further postural adjustment that is often unwittingly made

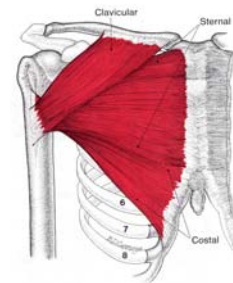


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protraction in which the most common finding is anteriorly rounded shoulders. Often, individuals with upper extremity paresthesias seek medical treatment and are referred for physical or occupational therapy treatment. Frequently, these individuals are given a series of strengthening exercises for the shoulder, although occasionally they also receive instruction in more upright posture during sitting activities. Commonly however, they are given a home exercise program and are rarely seen for follow-up. The exercise program for shoulder muscle strengthening usually includes flexion and extension as well as internal and external rotation activities. In general, strengthening exercises for rhomboids and middle trapezius muscles are given short shrift and little emphasis is placed on these muscles versus those of the shoulder. The purpose of this study is to determine the effects of Kinesio Tex[®] taping of the rhomboid muscles on retraction of the scapula in normal sitting and standing postures. In a further study, the results will be compared to those obtained in subjects given a standard exercise program for the shoulder and scapula.

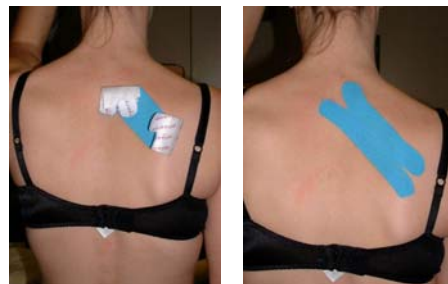
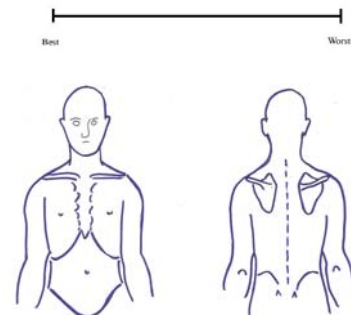


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Methods: Ten otherwise healthy, adult volunteers of either gender were enrolled in the study. Ages of the subjects were between 20 and 45 years. The study was a single group repeated measures design. All subjects read and signed an informed consent form prior to onset of experimentation. Each subject filled out a Visual Analogue Scale (VAS) indicating presence of and amount of shoulder or upper extremity discomfort, and also indicated if there were brachial paresthesias present at any time during the previous 30 days. The subject then was placed in a comfortable seated position in a standard office chair. Reflective markers were placed at the sternal notch, superior and inferior angles of the scapula, spinous process of the C7 vertebra, the



posterolateral angle of the acromion, lateral humeral epicondyle, radial tuberosity, tip of the 3rd metacarpophalangeal (MCP) joint and the greater tuberosity of the femur. The position of the scapula relative to the trunk was analyzed using a Vicon Motion Analysis System (Vicon™, Tustin, CA). The subject was asked to perform shoulder flexion to assist in analysis of shoulder function as indicated by shoulder active range of motion.



Following this procedure, each subject was taped over the rhomboid muscles of the upper back and to the pectoralis major muscles anteriorly on the side on the involved upper extremity. Kinesio Tex® tape for each muscle was applied following the method of Kase (1997). For the rhomboid muscle, an “X” cut strip was made from 2” width tape. The tape anchor was applied to the approximate middle of the muscle belly while the subject maintained their shoulder in adduction and internal rotation as in reaching toward opposite hip. This position resulted in scapular protraction which stretched the rhomboid muscle and associated fascial tissues. The ends of the tape were applied with the subject’s



scapula in its normal resting state. For the pectoralis major muscle, a “Y” tape was cut from 2” width tape. The tape anchor was applied at the intertubercular groove of the humerus, and the tape tails were applied as the subject maintained the shoulder in horizontal abduction and extension to stretch the muscle and associated fascia. The position of the subject’s scapula was then relocated as indicated by the Vicon System, and the shoulder range of motion in flexion was again measured to determine if there were changes in either posture or active range of motion due to the presence of Kinesio Tex® tape.



Qualitative data were derived from these measurements.



Results: Subjects had a significantly retracted scapula while wearing Kinesio Tex® tape over the rhomboid muscles of one side compared to the no tape condition ($p < .05$). In addition, there was a significant decrease in subject's discomfort, as indicated on the VAS, while wearing the tape compared to the no tape condition.



Discussion and Conclusions: The results of this study indicate that, at least in a small sample of subjects, Kinesio Tex® tape can be used to enhance scapular retraction. The study also indicated that application of Kinesio Tex® tape over the rhomboid and pectoralis muscles can significantly alter subject's upper extremity and shoulder discomfort probably due to changes in position of the scapula. These results indicate that taping for posterior and anterior musculature may alleviate upper extremity discomfort caused by downward shift of the humeral head with internal rotation of the shoulder, especially when the scapula is in a protracted position. The results of the study strongly suggest that further investigation of the effects of Kinesio Tex® tape on scapular position and postural re-education is warranted in a larger group of subjects.