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Is Kinesio Tape effective in relieving musculoskeletal pain in the geriatric population?

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CRITICALLY APPRAISED TOPIC

Title: Is Kinesio Tape effective in relieving musculoskeletal pain in the geriatric population?

Clinical Scenario: The patient who led me to pursue this question was a 62 year old female with pain related to musculoskeletal problems. Medical treatment to date has included medication, modalities and rest (non-use). Problems identified (or PT diagnosis) include fractures, joint replacements, Cerebrovascular Accident (CVA) , and muscle damage related to falls.

Brief introduction: For the purposes of my clinical question, I want to know about the effect of Kinesio Tape on patients with musculoskeletal pain. The patients in the place I am working often have fractures, joint replacements, osteoporosis, muscle injuries related to falls, strokes, etc. Although this intervention is most commonly used in younger orthopedic populations, it is used at this Skilled Nursing Facility to treat pain and edema.

My Clinical question: Is Kinesio Tape effective in relieving musculoskeletal pain in the geriatric population?

Clinical Question PICO:

Population – Geriatric patients with pain related to musculoskeletal problems.
Intervention – Kinesio Tape (KT)
Comparison – Medication, other Modalities, Rest (non-use)
Outcome – Pain (visual analog scale), Range of Motion (goniometry), Pain Free ROM (VAS, goniometry), Mobility as measured by a physical therapist with the Functional Index of Mobility (FIM) .

Overall Clinical Bottom Line:

At this point there have been no studies that suggest that the Kinesio Tape treatment will decrease pain or increase pain free range-of-motion in my clinical population of geriatric adults with pain related to musculoskeletal problems. The most current literature related to Kinesio Tape suggests that in young people with acute injuries, KT may work a little bit better than Sham KT in restoring ROM and reducing pain. More research must be done in order to get a more complete understanding of the clinical effectiveness of Kinesio Tape with older adults.

Search Terms: Kinesio, tape, kinesiotape, edema, pain

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Rationale chosen articles:

I wanted to find articles related to kinesio tape used in the treatment of pain or edema. Therapists at my internship site use kinesio tape for these diagnoses, and are about to take some continuing education classes on Kinesio Tape techniques.

I could only find two edema related articles. One related to post-mastectomy lymph edema and one related to increasing blood flow. There were more articles related to pain available. I chose the three that most related to musculoskeletal pain.

The Thelen and Gonzalez-Iglesias articles had the best Physiotherapy Evidence Database (PEDro) scores by far. The only PEDro score that was in the database was the one for Gonzalez-Iglesias. The PICOs for each article were fairly similar, each having a population dissimilar to my clinical population. All three had decent comparison treatments and all had satisfactory outcome measures. Overall, the Thelen and Gonzalez-Iglesias articles were the best articles for my clinical question.

Articles:

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;38:389-395.

PEDro Score 9/10
Patient: Forty-two subjects clinically diagnosed with rotator cuff tendonitis/impingement
Intervention: Kinesio Tape
Comparison: Sham Kinesio Tape
Outcome measures: Pain and Disability Index (SPADI), pain-free AROM, 100-mm visual analogue scale (VAS) to assess pain intensity at the endpoint of pain-free active shoulder ROM

Gonzalez-Iglesias J, Fernandez-De-Las-Penas, Cleland J, Huijbregts P, Gutierrez-Vega MDR. 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 and Sports Therapy* 2009; 515-521.

PEDro Score 8/10
Patient: 41 patients reporting neck pain as a result of a motor vehicle accident within 40 days of the injury, referred by their primary care physician to a physical therapist
Intervention: Kinesio Tape
Comparison: Sham Kinesio Tape
Outcome measures: Cervical ROM, Pain (11 point scale)

Nosaka K. The Effect of Kinesio Taping® on Muscular Micro-Damage Following Eccentric Exercises. *15th Annual Kinesio Taping International Symposium Review* 1999; pp. 70-73 Tokyo, Japan: Kinesio Taping Association.

PEDro Score 2/10
Patient: Twelve male students who had never been involved in any resistance training program
Intervention: Kinesio Tape
Comparison: No Kinesio Tape
Outcome measures: difference of the maximal isometric force (MIF) for the elbow in a 90 degree angle, ROM of the elbow joint, the pain scale (during extension, flexion, and pressure), circumference of the brachium (4 areas in length from the elbow joint 5, 7, 9, & 11cm were measured), plasma levels of creatin kinase (CK) from the blood, and an ultrasound diagnoses (using a B mode ultrasound device to measure muscle thickness and signal intensity of the brachium flexor group)

Table 1. Comparison of PEDro Scores

	Thelen *et al.*[·]	Gonzalez-Iglesias *et al.*[¨]	Nosaka *et al.*[¨]
Random	1	1	1
Concealed allocation	1	1	0
Baseline comparability	1	1	0
Blind Subjects	1	1	0
Blind Therapists	0	0	0
Blind Assessors	1	1	0
Adequate Follow-up	1	1	1
Intention-to-Treat	1	0	0
Between Group	1	1	0
Point Estimates & Variability	1	1	0
Total Score	9/10	8/10	2/10

Based on the above comparisons, I have chosen to write this critically appraised paper on the articles by Thelen *et al*. and Gonzalez-Iglesias *et al, etc*.

Article: Thelen *et al*., 2008.

Clinical Bottom Line:

In this study, young adult military students with rotator cuff tendonitis/impingement were randomized into two groups receiving either a KT treatment or a sham KT treatment. The only outcome measure with a significantly different improvement between groups was shoulder abduction pain free PROM immediately after the first KT treatment. Otherwise both groups significantly improved in every category by the last day of the study.

There were no significant threats to internal validity. The KT treatment is inexpensive after the continuing education to learn it. The study is minimally externally valid for my question because it does not match my clinical population.

Article PICO:

Patient: The patients were forty-two college students from the U.S. Military Academy between 18-24 years of age, clinically diagnosed with rotator cuff tendonitis/impingement

Intervention: Kinesio Tape (KT)

Comparison: Sham Kinesio Tape

Outcome measures: Pain and Disability Index (SPADI), pain-free AROM, 100-mm visual analogue scale (VAS) to assess pain intensity at the endpoint of pain-free active shoulder ROM

Blinding: In this study subjects were blinded. The tape was visually hidden from the subjects by a short sleeve shirt and each subject stated at the end of the study that they did not know which group they were in. The single therapist performing both the interventions for both groups was not blinded. The single assessing therapist was blinded as to which group each subject was in. I believe that the taping therapist not being blinded is not a threat to internal validity.

Controls: The control group received sham KT. I believe that this is a satisfactory way to test this intervention against no treatment, while factoring in the placebo effect. The differences between groups can most likely be attributed to the differences in tape application. This study did not use other treatment groups (soft tissue mobilization, therapeutic exercise, etc.) to compare KT's effectiveness against other therapeutic interventions. Also, it would have been better if there had been a no-treatment control group to factor in natural healing time into their study.

Randomization: The assignment of subjects to groups was randomized. The randomization was not stratified. The randomization was concealed from the parties that were blinded. No meaningful differences existed between groups at baseline.

Study: The study was a randomized, double blinded, clinical trial. There were 21 subjects in both the control and treatment groups.

The inclusion criteria were pain onset prior to 150° of active shoulder elevation in any plane, positive empty can test indicating possible supraspinatus involvement, positive Hawkins-Kennedy test indicating possible external impingement, subjective complaint of difficulty performing activities of daily living, and being 18 to 50 years of age.

The exclusion criteria were shoulder girdle fracture, glenohumeral dislocation/subluxation, acromioclavicular sprain, concomitant cervical spine symptoms, a history of shoulder surgery within the previous 12 weeks, or shoulder pain for longer than 6 months.

Subjects who were prescribed NSAID's prior to the study were told to keep taking them as directed. Subjects who were not taking NSAID's were told to avoid taking them during the study. All subjects were excused from performing upper extremity exercises (military school) during the study.

After the first tape application, subjects wore the tape for 48 to 72 hours. They were told to remove the tape earlier than this, only if they had any skin irritation or increased shoulder discomfort. No subjects needed to remove the tape earlier than instructed. Two subjects had a mild, nonpruritic rash at day 6, which resolved within 24 to 48 hours of tape removal. Otherwise, no adverse effects were noted.

At the day 3 follow-up, subjects were taped again with the same technique, according to their group assignment. They were told to wear the tape for an additional 48 to 72 hours. On day 6, the final outcome measures were assessed. After the final outcome measures were obtained, subjects were disenrolled from the study and continued to be treated as clinically indicated.

Outcome measures: The three outcome measures were the Pain and Disability Index (SPADI), pain-free AROM, and 100-mm visual analogue scale (VAS) that assessed pain intensity at the endpoint of pain-free active shoulder ROM. All three of these coincide with my desired clinical outcome measures.

Shoulder ROM's measured using a goniometer were forward flexion, abduction, and scapular plane elevation. Pain-free AROM was measured at the "point of first onset of pain". A 100-mm VAS was used to record the pain intensity experienced at the end point of the pain-free active ROM.

Negative change scores on VAS and SPADI indicate improvement; whereas positive change scores for ROM indicate improvement. A power analysis demonstrated the need for at least 26 subjects per group, given a SD of 25 mm on the VAS, a difference in pain intensity between groups of 20 mm on the VAS, an alpha level of .05, and a power set at 80%.

Descriptive statistics were calculated for both groups at 4 time intervals: baseline (before taping), immediately after taping, day 3, and day 6. The SPADI was only measured once at the time of the initial visit, as the score would not be expected to change immediately after taping. Each subject had ROM and VAS measures completed before and after the initial tape application.

The study addressed the reliability of some outcome measures. The SPADI was stated (with references) to be valid and reliable with a minimum clinically important difference (MCID) of a 10 point (100 point scale) decrease in score. This was the only MCID referenced in the study. The study defined meaningful change as a subject that showed a 15° increase in pain-free active ROM. A 2-point reduction on the 11-point numerical pain rating scale (NPRS) has been shown to be of clinical importance according to the study. They determined that a 20-mm decrease on the VAS by day 6 would be considered a meaningful change.

The authors did not address intra/inter rater reliability of their outcome measures. Whether or not these outcome measures were the gold standard was not addressed. However, they seemed very logical and related to the pain and ROM of the shoulder.

Study losses: Seven subjects (3 treatment group and 4 sham group) failed to return for day 6 re-evaluation. All 7 subjects improved and did not seek further care for their shoulder pain. Their reason stated for not completing the study was their busy class schedules.

The authors accounted for the missing data from day 6 by performing an intention-to-treat analysis. They used the last observation carried forward (LOCF) model and cited references for it. The technique involves using the last recorded value for each outcome measure and applying it to the remaining missing values.

Only 83% of the subjects completed the day 6 assessment. Otherwise, 100% of subjects completed every other assessment. It does not appear that the study losses are related to the interventions. Lastly, the subjects were all analyzed in the groups in which they were assigned.

Summary of internal validity: The internal validity of this study was good. There was adequate randomization and blinding. Some of the outcome measures were validated, but all seemed logical. The subjects were similar at baseline.

Because there were some subject losses towards the end of the study, an intention to treat analysis was performed. No inter-rater reliability was needed, because only one assessor was used. Intra-rater reliability would have been helpful to know. All of these threats to internal validity were minor.

Evidence: In Table 2, mean differences between groups are calculated as the KT group minus the Sham KT group. The authors used a group-by-time 2-way mixed model analysis of variance (ANOVA) for shoulder ROMs between the KT and Sham KT group with time as the repeated factor.

A multivariate analysis of variance (MANOVA) for the day 1 data revealed a significant main effect for group regarding the mean change scores ($F = 2.64$; $P = .049$). They conducted a Univariate ANOVA to find where a difference existed. The only difference found at day 1 was that the change score for pain-free shoulder abduction ROM in the treatment group showed a significant improvement when compared to the sham group ($F = 8.8$; $P = .005$). It demonstrated a mean difference of 19.1° (99% CI: 1.7, 36.5) between groups.

A repeated-measures MANOVA was again calculated for the day 3 and day 6 data. A main effect for change over time (F= 9.3, *P*=.001) was demonstrated as both groups significantly improved in all outcome measures by day 6 and exceeded the predetermined criteria for success. However, no main effect for group (F = 1.3, *P* = .28) or group-by time interaction effect (F = .76, *P* = .58) was observed.

TABLE 2
Mean Differences Between Groups in Painless Shoulder ROM (degrees) increase compared to Baseline

	Day 1	**Day 3**	**Day 6**
ABD	19.1	16.6	10.3
Forward Flexion	6.8	5.6	8.9
Scap. Plane elev.	8.0	10.3	5.4

The scores in Table 3 represent the KT group mean minus the Sham KT group mean. A negative score indicates a decrease in pain. All score values were based on baseline measurements. The authors used MANOVA tests to evaluate VAS data. No significant difference was found between groups. Overall, both groups improved in their VAS (decrease in pain score) by day 6.

TABLE 3
Mean Differences Between Groups in VAS Shoulder Pain compared to Baseline

	Day 1	Day 3	Day 6
VAS Pain Score	-6.1	3.8	3.3

The scores in Table 4 represent the KT group mean minus the Sham KT group mean. A negative score indicates a decrease in the Should Pain and Disability Index score. All score values were based on baseline measurements. There were no scores collected on Day 1, because it was so close to the baseline score collection. The authors used MANOVA tests to evaluate SPADI data. No significant difference was found between groups. Overall, both groups improved in their SPADI (decrease in score) by day 6.

TABLE 4
Mean Differences Between Groups in
SPADI scores compared to Baseline

	Day 3	Day 6
SPADI score	-0.9	-2.2

Applicability of study results:

Benefits vs. Costs:

The financial costs of KT treatment include continuing education classes (time and money) as well as the tape itself (around $11 per roll). Performing the intervention does not take very long, and it's effects can potentially last more than one day.

The patient has to take the time to remove the tape. Pt's can have skin reactions from KT, but it seems to be a small percentage of people. With that being said, there is limited research concerning how the geriatric population's skin reacts to KT. The two groups in the study received the same amount of intervention, due to the fact that the Sham KT treatment mimicked the KT group.

Feasibility of treatment:

The interventions in the study were described well enough for a clinician to recreate them. However, a clinician would need to take continuing education classes covering technique as well as other areas of the body to be competent with this treatment.

The equipment, clinical expertise, and time were not beyond what would likely be available in a PT setting. The number and duration of PT sessions in the study were within the range of that allowed by insurance companies. The treatment is feasible for patients.

I believe that most patients would adhere to their portion of this treatment (wearing tape for specific period of time). The only patients that would not be compliant would be those who experience skin reactions or discomfort, which does in fact happen. The treatment is not usually painful, other than possible negative skin reactions.

Summary of external validity:

The internal validity of this study does not compromise the ability to generalize it's results. Although this subject sample is similar to a population seen in an outpatient orthopedic clinic, it is not similar to my population in a SNF. The results of this study can only be applied to the greater population of young fit men with shoulder pain and no severe injury.

Article: Gonzalez-Iglesias *et al*., 2009.

Clinical Bottom Line:

The subjects in this study were 41 patients reporting neck pain as a result of a motor vehicle accident within 40 days of the injury. They were referred by their primary care physician to a physical therapist and met criteria for a Whiplash Associated Disorder (WAD). The comparison group received KT, while the control group received sham KT. Both outcome measures of the numerical pain rating scale (NPRS) and cervical ROM measurements showed statistically significant changes in their mean differences from baseline between groups at both assessment points. However, the improvements in cervical ROM didn't surpassed the "minimal detectable change" and the mean difference for NPRS did not even meet the MCID of 2 points.

There were no significant threats to internal validity. The KT treatment is inexpensive after the continuing education to learn it. The study is minimally externally valid for my question, because it does not match my clinical population.

Article PICO:

Patient: 41 patients reporting neck pain as a result of a motor vehicle accident within 40 days of the injury, referred by their primary care physician to a physical therapist
Intervention: Kinesio Tape
Comparison: Sham Kinesio Tape
Outcome measures: Cervical ROM, Pain (11 point scale)

Blinding: Group allocation by randomization was performed by a researcher that was not involved in the assessment or treatment of patients. A second therapist, blinded to baseline examination findings proceeded with treatment according to the group assignment. The subjects received the Kinesio Tape application the day after the initial examination by the primary author, a certified Kinesio Tape practitioner, who was blinded to patient information.

Pain and cervical range-of-motion data were collected at all assessment periods by an assessor blinded to the treatment allocation of the patients. Patients were blinded to the treatment allocation and reported that they had had no previous treatment with Kinesio Tape. All patients reported at the end of the study that they were unaware of their group assignment.

Controls: The control group received sham KT. I believe that this is a satisfactory way to test this intervention against no treatment, while factoring in the placebo effect. The differences between groups can most likely be attributed to the differences in tape application. However, it obviously doesn't compare KT's effectiveness to other therapeutic interventions. Also, it would have been better if there had been a no-treatment control group to control for natural healing time.

Randomization: After baseline examination, patients were randomly assigned to receive KT to the cervical spine or Sham KT. Concealed allocation was performed using a computer-generated randomized table of numbers. This was created prior to the start of data collection by a researcher not involved in the assessment or treatment of patients.

Sequentially numbered index cards with the random assignment on them were made. The index cards were folded and placed in sealed opaque envelopes. A second therapist, blinded to baseline assessment findings, opened the envelope and proceeded with treatment according to the group assignment. The randomization was not stratified.

Baseline characteristics between the groups were similar for all variables. This included demographic data including age, gender, medical history, and location and nature of the symptoms. Subjects also completed the Neck Disability Index (NDI) to measure self-perceived disability, which was similar at baseline. The two primary outcome measures of cervical ROM and pain, were also similar at baseline.

Study: This study was a randomized controlled trial. Fifty-two consecutive patients (convenience sample) were screened for possible eligibility criteria. Forty-one patients (mean age of 33 +/- 7 years, 52% female) satisfied the eligibility criteria. They were randomized into the KT (n = 21) or the sham KT (n = 20) groups.

All patients recruited for the study were reporting neck pain as a result of a Motor Vehicle Accident (MVA) within 40 days of the injury, and referred by their primary care physician to a physical therapist. The eligibility guidelines used for the study were the Quebec Task Force Classification of Whiplash Associated Disorder (WAD) II. This includes neck pain symptoms and musculoskeletal signs without evidence of conduction loss on clinical neurological examination.

Patients were excluded if they experienced a concussion, loss of consciousness, or head or upper quadrant injury during the motor vehicle accident. They were also excluded if they had sought treatment prior to their accident for neck pain; or reported a previous history of whiplash, neck pain, headaches, psychiatric or psychologic condition. Other reasons for exclusion included being affected by any neurologic or circulatory disorders, having other somatic conditions (eg, fibromyalgia syndrome), or having a current claim for litigation or compensation.

The amount of subjects excluded from the study was 11 out of the 52. The reasons were: 3 for previous diagnoses of migraine, 3 for previous whiplash, 2 for fibromyalgia, 3 for litigation.

All subjects were informed to not take any analgesic or anti-inflammatory drugs for 72 hours prior to the study. They also completed self-report measures and received a standardized history and physical examination by an experienced therapist. The tape (Kinesio Tex Tape; Kinesio Holding Corporation, Albuquerque, NM) used in this study was waterproof, porous, and adhesive. The tape, with a width of 5 cm and a thickness of 0.5 mm, was used in both groups.

The experimental group received a standardized therapeutic Kinesio Tape application, further detailed in the article. The sham group received a placebo KT application, also detailed in the article. Both tape applications looked very similar, but the placebo group had no tension applied to the cervical structures.

Outcome measures:

The outcome measures for this study consisted of a numerical pain rating scale (NPRS) and cervical range-of-motion measurements. The NPRS (0, no pain; 10, maximum pain) was used to record the patient's current level of neck pain. A 2-point reduction on the 11-point NPRS has been shown to be the minimal clinically important difference in patients with low back pain. An article was cited to confirm this MCID.

Cervical range of motion was assessed with the patient sitting comfortably on a chair, with both feet flat on the floor, hips and knees at 90° of flexion, and buttocks positioned against the back of the chair. A cervical range-of-motion (CROM) device was used to measure flexion, extension, right lateral flexion, left lateral flexion, right rotation, and left rotation. Three trials were conducted for each direction and the mean values of the 3 trials were recorded. Reliability testing of the CROM device in previous studies indicates intraclass correlation coefficients ranging from 0.66 to 0.94.

Both pain and cervical range-of-motion data were collected at baseline, immediately after the Kinesio Tape application, and at a 24-hour follow-up. The authors did not cite intra- or inter-rater reliability for these outcome measures and did not report their own. The authors discussed previous kinesio tape research and outcomes pertaining to physical therapy to validate these outcome measures. Although CROM is a popular way to measure active cervical range-of-motion, the gold standard is x-ray. Also, there is no gold standard for measuring pain, due to it's subjective nature.

Study losses: There were no study losses reported. There does not appear to be any missing data. No intention to treat analysis was performed. All of the subjects were analyzed in the groups in which they were randomized.

Summary of internal validity: In my opinion, the internal validity of this study was good. The randomization, blinding, and validity of outcome measures were all adequate. The subjects were similar at baseline and no subjects were lost. There were no major threats to internal validity.

Evidence: The outcome measures for this study consisted of a NPRS and cervical ROM measurements and both are explained above. Data were analyzed with SPSS, Version 14.0. Key baseline demographic variables and scores on the self-report measures were compared between groups using independent *t* tests for continuous data and chi-square tests of independence for categorical data.

Separate 2-by-3 mixed-model ANOVAs were used to examine the effects of treatment with pain and cervical range of motion being the dependent variables, with group as the between-subject variable and time as the within-

subject variable. The hypothesis of interest was the group-by-time interaction at an a priori alpha level equal to .05. The values for within- and between-group differences with associated 95% confidences intervals were given. The time intervals were immediate posttreatment and 24- hour follow-up for both pain and cervical range-of-motion measurements.

If in this study a significant interaction was identified on a variable, planned pairwise comparisons were performed to examine differences from baseline to each follow-up point between groups. This was to investigate if any between-group differences in change scores were statistically significant.

The scores in Table 5 represent the KT group mean minus the Sham KT group mean. A negative score indicates a decrease in pain. All score values were based on baseline measurements. This table is based on the author's statistical data.

The group-by-time interaction for the 2-by-3 mixed-model ANOVAs was statistically significant for neck pain as the dependent variable (F = 64.8; *P*<.001). Planned pairwise comparisons indicated that patients receiving the KT intervention experienced greater reduction in neck pain both immediately post-application and at 24-hour follow-up (both, *P*<.001). Although there was a significant difference, the mean difference did not meet the MCID of 2 points.

TABLE 5
Mean Differences Between Groups in
NPRS Neck Pain compared to Baseline

	Immediate Posttreatment	**24-Hour Follow Up**
Neck Pain NPRS	-.09	-1.1

In Table 6, mean differences between groups are calculated as the KT group minus the Sham KT group. This table is based on the author's statistical data. The group-by-time interaction for the 2-by-3 mixed-model ANOVA was also statistically significant for all directions of the cervical range of motion: flexion (F = 50.8; *P*<.001), extension (F = 50.7; *P*<.001), right (F = 39.5; *P*<.001) and left (F = 3.8, *P*<.05) lateral flexion, and right (F = 33.9, *P*<.001) and left (F = 39.5, *P*<.001) rotation.

Planned pair-wise comparisons showed that patients in the experimental group obtained a greater improvement in cervical range of motion than those in the control group (all, *P*<.001). However, none of the differences between groups for improvements in cervical range of motion surpassed the "minimal detectable change" (the minimal change needed to occur to exceed the measurement error) for the respective measurements. The minimal detectible changes for each cervical ROM are presented in Table 6.

TABLE 6
Mean Differences Between Groups in Cervical ROM (degrees) increase compared to Baseline

	Immediate Posttreatment	24-Hour Follow Up	Minimal Detectable Change
Flexion	6.6	7.4	18.8
Extension	8.2	8.5	13
Right Lateral Flexion	5.4	5.8	10
Left Lateral Flexion	3.1	2.3	19
Right Rotation	5.5	6.1	13.9
Left Rotation	5.2	4.1	13.9

Applicability of study results:

Benefits vs. Costs: The financial costs of KT treatment include continuing education classes (time and money) as well as the tape itself (around $11 per roll). The cost of the tape itself is affordable compared to the amount that a therapist can bill for the KT treatment. Pt's can have skin reactions from KT, but it seems to be a small percentage of people. With that being said, there is limited research concerning how the geriatric population's skin reacts to KT.

There are a few benefits to using the KT treatment. Performing the intervention does not take very long, and it's effects can potentially last more than one day. However, the evidence suggests that there is only a small chance that KT could make small improvements in pain and pain free ROM. In this case, the largest cost is the therapist's treatment time. This is time they could be utilizing a more effective treatments. Due to the lack of evidence that this treatment is effective, the costs outweigh what little benefit this treatment could have.

Feasibility of treatment: The interventions in the study were described well enough for a clinician to recreate them. However, a clinician would need to take continuing education classes covering technique as well as other areas of the body to be competent with this treatment.

The equipment, clinical expertise, and time were not beyond what would likely be available in a PT setting. The number and duration of PT sessions in the study were within the range of that allowed by insurance companies. The treatment is feasible for patients.

I believe that most patients would adhere to their portion of this treatment (wearing tape for specific period of time). The only patients that would not be compliant would be those who experience skin reactions or discomfort, which

does in fact happen. The treatment is not usually painful, besides possible negative skin reactions.

Summary of external validity: The internal validity of this study does not compromise the ability to generalize it's results. Although this subject sample is similar to a population seen in an outpatient orthopedic clinic, it is not similar to my population in a SNF. This population that this study can be extrapolated to is younger people who have suffered an acute WAD injury. Also, this study used a convenience sample, which is not necessarily an accurate representation of the general population.

Synthesis/Discussion

Although these studies focused on different areas of the body, they both agreed that Kinesio Tape is clinically ineffective in the treatment Musculoskeletal problems. In both studies, subjects showed only modest improvements in some outcome measures with the kinesio tape treatment. None of these improvements met the MCID's and were therefore relatively insignificant. These studies may not have been able to show significant differences either due to small sample size or ineffectiveness of the treatment itself.

Although these were studies were high quality, they didn't match my clinical population. In fact, there is very little literature in general pertaining to my clinical question. Therefore, I can be confident in my clinical conclusion. There is very little evidence suggesting that Kinesio Tape is effective in decreasing pain and increasing pain free range-of-motion in geriatric patients with musculoskeletal conditions.