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ABSTRACT

Clinical Scenario: Lateral ankle sprains are one of the most common injuries associated with athletes. Based on the current evidence, external support has been found to be one of the most effective preventative measures for ankle injuries alongside neuromuscular training. **Focused Clinical Question:** The purpose of this review was to find the difference in effects between taping and bracing for the treatment of lateral ankle sprains when focusing on functionality using the Karlsson score or its components. **Search Strategy:** Participants were included if they were between the ages of 16 and 65, and reported with a history of an isolated lateral ankle sprain within 72 hours of the injury. Studies were excluded if there was previous history of ankle or lower limb injuries within the last year, any previous surgeries to the lower limb, chronic ankle instability, and current fractures. Computerized literature searches were limited to the Journal of Athletic Training and databases within PubMed, Cochrane, ProQuest, and CINAHL. In order to limit the number of studies found within each database, keywords were used in combination for search topics. Applicable studies were generated through this set of keywords: lateral, ankle sprain, bracing, taping, semi-rigid, function, and Karlsson. A total of 161 articles were reviewed from the given criteria and terms. This review is constructed from the seven studies that did qualify based on the set criteria. **Evidence Quality Assessment:** Scores of 3/10 – 8/10 were received via the PEDro scale, whereas the Oxford 2011 Level of Evidence Scale scored each of the utilized articles as a 2. **Results and Summary of Search:** While taping may be a short-term fix, bracing could in fact be a better long-term solution. Tape can contour to the body providing reinforcement and maximal support to a previously injured joint however, movement reduces the lasting effects of the tape job by breaking down the elastic hold. Bracing provides compression and support however, it leaves the ankle weak and reliant on the brace. Overall weakness of the studies includes using a variety of rehab protocols, braces, and consistently low inter-rater reliability among tapings. Overall strengths of the studies include all studies using similar duration of treatment length and consistency between grade II or III strains. **Clinical Bottom Line:** There is not enough significant statistical evidence to be able to say that there is a difference in effectiveness between bracing and taping for the treatment of lateral ankle sprains when focusing on functionality. This review scores a “B” for the Strength of Recommendation Taxonomy. **Implications:** Upon review, both taping and bracing have proven to be beneficial for the treatment of lateral ankle sprains. Taping or bracing however; should not be the extent of treatment. Treatment should include the use of strengthening, proprioception, and functional exercises.

FOCUSED CLINICAL QUESTION

What is the difference between taping and bracing for the treatment of lateral ankle sprains when focusing on functionality using the Karlsson score or its components?

SEARCH STRATEGY

- This review is an updated approach looking at currently published studies to establish the optimal strategy to prevent lateral ankle sprains based on function.
- Computerized literature searches were limited to the databases within PubMed, Cochrane, ProQuest, and CINAHL.
- 161 applicable studies were generated through this set of keywords: lateral, ankle sprain, bracing, taping, non-elastic, semi-rigid, function, and Karlsson.
- Studies containing a similar research approach on lateral ankle sprains, peer reviewed original research, and obtaining results on functional outcomes or the Karlsson’s score were considered.
- Reference lists were also examined for potential studies.
- Terms used synonymously with taping could include: non-elastic, closed basket weave, elastic taping, and elastic bandage.
- Terms used synonymously with bracing could include: aircast, semi-rigid, soft
- Inclusion criteria consisted of aging between 16 and 65 and reporting an isolated lateral ankle sprain within 72 hours of the injury.
- Exclusion criteria consisted of previous history of ankle/lower limb injuries within the last year, chronic ankle instability, and current fractures.

RESULTS AND SUMMARY OF SEARCH

Table 1. Comparison of studies

Author	Subjects	Results
Lardenoye, et al ¹	100	Karlsson score: 2 weeks post: Brace = 47, Tape = 55. 4 weeks post: Brace = 55, Tape = 56. 8 weeks post: Brace = 60, Tape = 65. 12 weeks post: Brace = 58, Tape = 59. ROM: Passive at 4 weeks: Tape = 12.5, Brace = 12.3 (P-value = .9). Active at 4 weeks: Tape = 13.7, Brace = 12.8 (P-value = .7). Passive at 12 weeks: Tape = 3.6, Brace = 5.8 (P-value = .2). Active at 12 weeks: Tape = 6.1, Brace = 6.1 (P-value = 1.0).
Kemler, et al ²	157	Swelling: Brace = 16.2%, Taping = 18.5% (P-value = .820) Function: Brace = 29.4%, Taping = 27.7% (P-value = .850). Instability (Ant drawer): Brace = 29.4%, Tape = 12.3% (P-value = .019). Pain (weight bearing w/ mvmt): Brace = 27.7%, Taping = 30.9% (P-value = .707).
Beynnon, et al ³	172	Karlsson score: Grade 2 = .19, grade 3 = .373. Function: Grade 2 = .487, Grade 3 = .154. ROM: DF: Grade 2 = .7984, Grade 3 = .3681. PF: Grade 2 = .6680, Grade 3 = .9958.
Hall, et al ⁴	42	Max inversion: P = .001 Time to max inversion: P = .009 Inversion velocity: P = .001 Perceived stability: P = .72
Bekerom, et al ⁵	193	Karlsson score: Tape = 32, Semi-rigid Brace = 33, Lace-up Brace = 40 (P-value = .47). VAS pain: Tape = -24, Semi-rigid Brace = -33, Lace-up Brace = -33 (P-value = .21) Return to sport: No return: Tape = 5%, Semi-rigid Brace = 11%, Lace-up Brace = 8% (P-value = .65)
Najafipour, et al ⁶	150	Karlsson score: Mean = 76/90 in both groups ROM: PROM: Week 0: P-value = .41. Week 4: P-value = .037. Week 12: P-value = .004. AROM: Week 0: P-value = .33. Week 4: P-value = .044. Week 12: P-value = .01. Pain (1=no pain, 5=overwhelming): Week 0: P-value = .78. Week 2: P-value = .001. Week 12: P-value = .031.

Table 2. Karlsson Scoring System

	Degree	Score
Pain	None	20
	During exercise	15
	Walking on uneven surface	10
	Walking on even surface	5
	Constant	0
Swelling	None	10
	After exercise	5
	Constant	0
	Constant (severe) using ankle support	0
Instability	None	25
	1-2 / year (during exercise)	20
	1-2 / month (during exercise)	15
	Walking on uneven ground	10
	Walking on uneven ground	5
Stiffness	None	5
	Moderate (morning, after exercise)	2
	Marked (constant, severe)	0
	Constant (severe) using ankle support	0
Stair climbing	No problems	10
	Impaired (instability)	5
	Impossible	0
Running	No problems	10
	Impaired	5
	Impossible	0
Work activities	Same as pre-injury	15
	Same work, less sports, normal leisure activities	10
	Lighter work, no sports, normal leisure activities	5
	Severe impaired work capacity, decreased leisure activities	0
	Constant (severe) using ankle support	0
Support	None	5
	Ankle support during exercise	2
	Ankle support during daily activities	0

CLINICAL SCENARIO

- Lateral ankle sprains are one of the most common injuries associated with athletes.
- The most common mechanism of injury is inversion stress with the addition of plantar flexion and adduction.
- The likelihood of inverting their ankle is high due to walking, running, and jumping on flat and uneven surfaces.
- In order to prevent this injury from reoccurring, athletic trainers utilize a plethora of taping and bracing techniques in conjunction with rehabilitation techniques.
- Based on the current evidence, taping and bracing has been found to be one of the most effective measures for reoccurrence of ankle injuries.

EVIDENCE QUALITY ASSESSMENT

- Of the six usable studies, four randomized controlled trials were used, one was a semi-randomized controlled trial, another was a non-randomized control trial, and the last one was a crossover study.
- Scores of 5-8 out of 10 were received via the PEDro scale.
- 2011 Oxford level of evidence scale scored each of the utilized articles as a 2.

CLINICAL BOTTOM LINE

- There is not enough significant statistical evidence to be able to say that there is a difference in effectiveness between bracing and taping for the treatment of lateral ankle sprains when focusing on functionality via the Karlsson score or its components.
- This review scores a “B” for the Strength of Recommendation Taxonomy.
- More research needs to be done to fully understand the effects each external support has on the ankle throughout the different stages on an injury.
- Most studies currently focus on comparing both support methods and use the same rehab protocol for all involved groups, however, looking at each type of support during each phase of healing might produce more helpful results for the athletic trainer’s clinical practice.

IMPLICATIONS

- Tape has the ability to contour to the body providing reinforcement and maximal support, however movement reduces the lasting effects of the tape job by breaking down the elastic hold.
- Bracing provides compression and support through an elastic immobilizing fabric.
- When comparing bracing and taping, bracing tends to leave the ankle weak and reliant on the brace resulting in a higher re-injury rate than taping.
- Factors to be considered when choosing between taping and bracing are the athletes sport, the stage of injury, and personal comfort.

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