Comparison of Two Taping Techniques on Navicular Drop and Center-of-Pressure Measurements During Stance

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ABSTRACT
This study examined the effectiveness of an antipronation spiral stirrup (APSS) taping technique, compared with the augmented low-Dye (ALD) technique, in controlling navicular drop (ND) and producing a lateral shift in the center-of-pressure (COP) line during the stance phase of gait. Twenty college volunteers participated in a crossover design, testing 2 taping techniques across 3 conditions. Repeated measures analysis of variance revealed that the APSS technique produced significantly less ND, compared with the ALD technique, at the pre- \((P < .05)\) and postexercise \((P < .05)\) conditions. The APSS technique produced significantly less ND than the barefoot condition at pre- and postexercise \((P < .01)\) conditions. A significant \((P < .05)\) lateral shift in COP was noted between 30% and 90% of the stance phase in the tape reexercise condition in the APSS technique. The APSS technique seems to be effective at controlling ND and preventing a medial shift of the COP during the deceleration phase of foot pronation.


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veruse lower-leg injuries, although often of uncertain etiology, are frequently affected by anatomical, mechanical, training intensity, volume, and injury type factors.1,2 The catch-all term shin splints has been used to describe a variety of conditions, including compartment syndrome, periostitis, stress fractures, nerve entrapment syndrome, and various tendinopathies.3,4 More recently, the shin splints term has been used interchangeably with an equally ambiguous, but more medically descriptive phrase, medial–tibial stress syndrome (MTSS).5 This syndrome is characterized by exercise-induced pain along the posteromedial border of the tibia, is not attributed to compartment syndrome or stress fracture,6,7 and is of idiopathic origins.

A common link of these varied pathologies with abnormalities in foot position is an increased drop in the location of the navicular bone. This drop, resulting in a “fallen arch,”8 is often referred to as pes planus. In a pes planus foot, the center of pressure (COP) is deviated more medially during gait than in those with a neutrally aligned foot.9-12 Williams et al13 found that low-arched individuals have a more medial COP than those with high arches, allowing the possibility that COP may be useful in detecting changes in foot orientation throughout the stance phase of gait (heel strike through toe-off).9-11 In addition, pes planus feet have been associated with tibialis posterior dysfunction.14,15 One of the primary functions of the tibialis posterior is to contract eccentrically throughout the deceleration phase of foot pronation.16 If the tibialis posterior is dysfunctional, it cannot effectively control the force that must be transferred from the foot to the lower leg, leading to its inability to control the “falling” of the arch. This hyperpronation during gait can result in lower-leg pain,3 which supports the theory that suggests that foot overpronation, attributable to tibialis posterior muscle dysfunction, is a possible cause of MTSS.7

Several researchers13,14 have studied the effectiveness of taping or use of custom shoe inserts as an effort to control navicular drop (ND). Orthotic inserts have proven to be
Comparison of Taping Techniques

somewhat effective, but these can become costly. Taping may provide a viable short-term alternative for overpronation (and resulting pes planus) and its associated ND. Although the most commonly used augmented low-Dye (ALD) technique has been shown to lessen ND due to its extension of tape up the limb, the current study explores a new technique—antipronation spiral stirrup (APSS)—as an effective, easy alternative to the ALD technique (Figures 1-2). The ALD technique is a combination of the low-Dye, 3 reverse sixes, and 2 calcaneal slings. The APSS taping technique starts under the lateral malleolus and crosses the front of the lower leg, intended to lift the longitudinal arch. In addition to controlling ND, the APSS and ALD techniques may also have an effect on COP.

The purpose of this study was to assess the effectiveness of the APSS taping technique, compared with the ALD technique in (1) reducing ND and (2) creating an increase of lateral shift of the COP. The authors hypothesized that the APSS technique would be as effective or more effective than the traditional ALD technique at controlling ND and cause a lateral shift in the COP during the stance phase.

METHOD

Study Design
This is a 2 (tape techniques: ALD and APSS) × 3 (condition: barefoot, tape preexercise, and tape postexercise), controlled laboratory crossover study design.

Demographic Variables. Demographic data (height; weight; health; physical activity level; use of orthotics; lower-limb surgery, therapy, or injury; gender) were collected via an initial questionnaire.

Dependent Variables. Raw dependent variable data points for each of 20 participants were generated by averaging 3 navicular height measurements per condition and 5 COP lines generated from the entire stance phase via a high-resolution mat system (HRM; TekScan, Boston, Massachusetts).

Independent Variables. Independent variables used in comparison were tape techniques (ALD and APSS) and condition (barefoot, tape preexercise, and tape postexercise).

Participants
Twenty (10 men and 10 women) college-aged (21.9 ± 2.27 years) volunteers with an ND ≥10 mm participated in this study. All participants were ambulatory (able to walk for 15 minutes) and free from lower-leg injury or pain within the previous month. Participants were separated into 2 groups via a coin toss. Group 1 received the ALD tape technique first. Group 2 received the APSS tape technique first. This was a repeated measures design. All participants signed a university institutional review board–approved letter of informed consent, and the institutional review board approved all study procedures.

Instrumentation
Navicular Drop. Navicular drop was measured using a ruler, an index card, and a pen according to procedures outlined by Delacerda. This technique previously has demonstrated adequate intratester validity and reliability (intraclass correlation coefficient [2,1] = 0.78 to 0.83).18

Center of Pressure. A valid and reliable (intraclass correlation coefficient = 0.75 to 0.76) HRM pressure mapping system (VersaTek Cuff, VersaTek 2-Port Hub, HRM Software CD, HRM Sensor #7101E, and Datalogger Unit; TekScan), was used to measure COP throughout the stance phase. Recordings were performed at 100 Hz. The mat system contains
8448 sensels, with a resolution of 25 sensels per inch, and the sensing area was 19.2 inches × 17.6 inches.

Measurements
All measurements were conducted by the lead researcher (K.M.P.). The ND was tested according to procedures reported by Delacerda,17 by marking the navicular prominence in a subtalar, neutral, seated, nonweight-bearing position and using an index card to mark both nonweight-bearing (seated) and weight-bearing heights (standing), with ND being the difference of these 2 points. Each foot was measured 3 times, and scores were averaged for each foot. The foot with the greatest ND was used for all subsequent testing. Qualified participants exhibiting a difference ≥10 mm were considered pes planus, according to the standard used by Delacerda17 and Sell et al.20

The COP measurements, collected using a pressure mat, yielded a 2-dimensional movie image (ie, a foot print; Figure 3) of the stance phase from heel-to-toe and medial-to-lateral boarders. Participants practiced to determine the appropriate distance that required 5 walking steps, with the fifth step striking the mat and continuing through until they were completely clear of the mat, finishing the task with 1 additional step off the mat. With the predetermined starting place, the participants were told to walk at a comfortable walking speed and focus on a picture on the adjacent wall to ensure that gait was as normal as possible. Five stance phase images per condition were recorded.

Session Protocol. The order of taping techniques was randomly assigned. Data were collected over 2 similar 1-hour sessions by the lead researcher as follows:
1. Upon arrival at the testing facility, participants filled out a survey designed to collect demographic and other pertinent data (eg, gender, height, weight, history, activity patterns).
2. Demographic data specific to the participant needed for the TekScan software was entered into the computer (ie, height, weight, gender).
3. Barefoot participants were measured with respect to ND (average of 3 measurements) and COP (average of 5 stance images collected from the stance phase).
4. Next, participants were taped by the same person, according to the procedures indicated in the taping procedures section below, and both measurements (ND and COP) were repeated. The researcher (K.M.P.) who performed the taping had 2 years of experience with the ALD technique and 4 years of experience with the APSS technique.
5. To determine the effectiveness of the taping technique following a bout of exercise, participants walked barefoot on a single-belt treadmill for 15 minutes at 3 mph at 0% grade on a Quinton Q65 Series 90 Treadmill (Quinton Instrument Co, Bothell, Washington).
6. After the bout of exercise, both measures (ND and COP) were repeated.
7. Within 3 weeks, session 2 used the same procedures described previously but with the other tape technique being tested.

Taping Procedures. As in previous studies,13,14,21,22 Leukotape 9 Sports Tape (BSN Medical Inc, Charlotte, North Carolina), a rayon-backed tape with an aggressive zinc oxide adhesive, was used in the current study, having consistently yielded the greatest reduction in ND during pilot testing.

Pretape spray (Mueller Sports Medicine Inc, Prairie du Sac, Wisconsin) was used with both tape techniques. Leukotape P Sports Tape was also used for both tape techniques.

The ALD taping technique15 is a combination of the low-Dye taping technique, plus 3 reverse sixes and 2 calcaneal slings. The participant held his or her foot in a dorsiflexed position during the entire application. The ALD was accomplished by a spur being attached on the medial aspect of the foot and wrapped around the foot to the adjacent side, followed by mini stirrups from the lateral side of the foot on the spur to the medial side on the spur. The reverse sixes were accomplished by lay-
ing down anchors, followed by 3 strips of tape that lay across the top of the foot medial to lateral, crossed under the foot lateral to medial, and back up the medial side, crossing the anterior portion of the ankle joint. The calcaneal sling technique was performed by laying down 1 anchor strip, followed by 2 strips that start on the anterior tibia and follow a pattern distally and just anterior to the medial malleolus, continuing under the foot and around the calcaneus and back up to the anchor strip. No prewrap was applied with this tape procedure.

The APSS technique was performed while the participant held his or her foot in an inverted but flexion-neutral position (ie, neither dorsi- nor plantar-flexed). A single piece of Cover-Roll stretch tape (BSN Medical Inc) was anchored on the lateral foot just anterior to the lateral malleolus, passed under the foot and crossed the medial foot at the navicular tubercle and anterior calcaneus. It then covered the medial malleolus and spiraled across the tibial shaft, terminating on shaft of the fibula. Next, 2 pieces of tape are administered in a similar fashion, with the strips overlapping 1-half inch. An anchor strip was applied to hold down the strip (Figures 1-2).

Data Analysis

Navicular Drop. All ND data were input into SPSS Statistics 20 software (IBM Corp, Armonk, New York). A 2 (tape techniques) × 3 (conditions) repeated measures analysis of variance and post hoc comparisons (via Tukey’s honest significant difference [HSD]) were used to detect differences in taping techniques across conditions, with a significance level set at \( P \leq .05 \).

Center of Pressure Line. Stance phase images (Figure 3) were acquired via the pressure mat. Two-dimensional COP coordinates were output from the TekScan software for each frame of the stance phase. The COP trajectory represents the center for all of the forces on the sensor for each frame, which were recorded at 100 frames/second. Because TekScan images were pace-and-foot-length dependent, both stance duration and foot-length data from all 600 images were standardized to 100 data points to allow for further comparisons. The x and y coordinates were found using an equation (Figure 4). Calculating the lateral shift of the COP line first required establishing a standard reference line in the barefoot condition. A straight line drawn from the COP at heel strike to the medial point on the border of the big toe during the COP at toe-off (Figure 3) was established for each of 5 trials for 20 participants across 6 conditions (2 tape techniques × 3 conditions). The distance from the COP line to this reference line was calculated at each time point (frame) throughout the stance phase, using the point–line equation by Weisstein\(^2^3\) (Figure 4) for each sample collected throughout the stance phase of the entire gait. In other words, the distance between the 2 lines was calculated for each point along the COP line. Each of the stance phases of gait was used in a functional linear model to detect differences in taping technique across conditions. All participants performed 5 trials in each taping technique and for each condition. The means of 5 trials were calculated and then were used for between-taping techniques and within-conditions comparisons.

Functional Analysis. It was first necessary to transform the lateral shift data into actual functions, using cubic smoothing splines.\(^2^4\) Next, these functions were normalized to have the same end points, using linear warping functions. This normalizing procedure accounts for amplitude variation in the functions due to individual differences in foot size or stance phase duration.\(^2^4\) With the functions normalized, altitude variation in the functions was analyzed to determine whether there were any statistically significant differences from the zero function in lateral shift throughout the entire stance phase (ie, as a function of time) across all 6 conditions.

All COP-related data (throughout the entire stance phase) were then examined statistically to assess the differences between the taping techniques and across conditions. A functional analysis of variance allows for a comparison of treatment effects as functional effects (polynomial functions) over the entire stance phase, rather than univariate or multivariate (discrete values) effects. In other words, we detected whether there was a difference between 2 groups and where in the stance phase those differences existed. As the means for inference, any difference between groups (effect) that exceeded zero (no effect) at a 95% confidence interval level was deemed statistically and clinically significant.
(P = .05). This allowed for statistical significance to be determined differently as a function of the stance phase.

Comfort Ratings. Participants were asked to rate the postexercise comfort level of both taping techniques using a 5-point Likert-type scale (1 = most uncomfortable to 5 = most comfortable). A between-tape types comparison was made using a Wilcoxon matched-pairs test. The rational for this test versus a paired sample t test was a low n and non-normal data.

RESULTS
Navicular Drop. Navicular drop data were determined to be normal (both skewness and kurtosis within ±2.0), and sphericity was assumed (Mauchly’s W = 0.927, P = .246). Results from the repeated measures analysis of variance revealed significant differences across conditions (barefoot, tape preexercise, tape postexercise [F2,76 = 17.41, P = .001], and a significant tape technique-by-conditions interaction from barefoot to the tape preexercise condition [F2,76 = 3.87, P = .025], Figure 5). Significant differences existing in the overall data set provided support for conducting post hoc comparisons via Tukey’s HSD.

Results showed that the APSS technique was significantly different from the barefoot condition (HSDTukey[3,76] = 1.44, P = .01) in both the tape preexercise and tape postexercise conditions (Table, Figure 5). Both of these differences exhibited large effect sizes ([M1−M2]/SDpooled; effect size [ES] = 1.32 and 1.15, respectively). A significant difference was noted (HSDTukey[3,76] = 1.14, P = .05), with the APSS producing less ND than the ALD (d = 1.41, with a large ES = 0.74) at the tape preexercise condition (Table, Figure 5). All other comparisons were found to be nonsignificant at the P = .05 level (Table, Figure 5). However, an examination of treatment effects revealed a moderate effect size between ADL barefoot and both the pre- and postexercise conditions.

Functional Analysis. As shown in Figures 6-7, the functional analysis to determine the lateral shift of the COP is interpreted as follows: The solid black line in the middle of the shaded region is the mean difference in lateral COP shift between the taping technique and the barefoot condition. The shaded region is the 95% confidence interval. If the confidence area contains the dashed zero line, the mean difference function is not significantly different from zero, meaning further that the lateral shift for the given treatment is not significantly different from the barefoot condition. Among all trials, the mean lateral shift was significant only for the APSS preexercise condition but not the postexercise condition (95% confidence interval). For the APSS tape preexer-

### Table

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#### BETWEEN GROUP EFFECT SIZE

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#### WITHIN GROUP EFFECT SIZE

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Abbreviations: ALD, augmented low-Dye; APSS, antipronation spiral stirrup.

1 Denotes P < .05 for between-group comparison (ALD to APSS pre- and postexercise conditions).
2 Denotes P < .01 for within-group comparison (barefoot preexercise to barefoot postexercise conditions), effect size = (M1 − M2)/SDpooled.

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Figure 5. Navicular drop (ND) means and standard deviations across 6 conditions. Although both taping techniques reduced ND, the antipronation spiral stirrup (APSS) taping technique was significantly different than the barefoot condition (P < .01). The APSS was also significantly different from the barefoot condition to both pre- and postexercise conditions. A conditions-by-tape technique interaction was noted (P = .025), indicating that the APSS is significantly more effective than the augmented low-Dye (ALD) taping technique across conditions. Error bars indicate ranges and confidence intervals of P < .05.
cise, the results indicate that the mean lateral shift was significantly different from the barefoot condition—between 32% and 92% of stance (Figure 7).

**Comfort Rating.** A significant difference was noted in comfort ratings, with the APSS technique ($M = 4.4$, $SD = 0.50$) rated significantly ($z = -2.81$, $P = .01$) more comfortable than the ALD technique ($M = 3.3$, $SD = 1.17$). Effect size calculations revealed a large taping technique effect ($ES = 1.22$).

**DISCUSSION**

The purpose of the current study was to compare the effectiveness of a new taping technique (APSS) to the standard ALD technique at (1) controlling ND and (2) causing a lateral shift in the COP line. The APSS technique was designed to control foot kinematics, which may be pathological contributors to MTSS and could result in possible stresses or injury to the tibialis posterior and its associated structures and functions. The authors hypothesized that the APSS technique would be as or more effective than the traditional ALD technique at controlling ND and cause a lateral shift in the COP during the stance phase. Generally, our results support that hypothesis. The APSS technique did result in an ND that was statistically different from the barefoot condition in both the tape pre- and postexercise conditions. Further, the APSS technique resulted in a more laterally deviated COP trajectory during most of the stance phase, but only during the tape preexercise condition. In speculation, the authors believe that placing the foot in an inverted position during the APSS taping technique contributed greatly (as was intended) to the lateral shift in COP. The lack of COP shift with the ALD technique might likewise be attributed to the neutral foot position that the ALD technique requires.

Similarly, Williams et al. found that pes planus individuals have a more medial COP than those with high arches, allowing for the possibility that COP may be useful in detecting changes in foot orientation throughout the stance phase of gait (heel strike through toe-off). Further, pes planus feet have been associated with tibialis posterior dysfunction. One of the primary functions of the tibialis posterior is to contract eccentrically throughout the deceleration phase of foot pronation. If the tibialis posterior is dysfunctional, it cannot effectively control the force that must be transferred from the foot to the lower leg.
leading to its inability to control the “falling” of the arch. This pes planus position during gait can result in lower-leg pain, which supports the theory that suggests that foot pes planus, attributable to tibialis posterior muscle dysfunction, is a possible cause of MTSS.

Controlling ND and lateral shift in the COP was of interest in this study due to their relationship to the structures of the foot and functions of the tibialis posterior and its hypothesized role in MTSS. It was expected that the APSS technique would produce a lateral shift in the COP line, but the level of sensitivity of the functional analysis revealed an even more targeted result than expected. The functional analysis identified where in time the changes in COP were seen—specifically from 30% to 90% of the entire stance phase. In other words, the APSS technique not only controlled ND in the tape pre- and postexercise conditions, but it also resulted in an increase in lateral excursion of the COP line in the tape preexercise condition during that portion of the stance phase associated with the function of the tibialis posterior.

Murley et al described biphasic tibialis posterior activity during the stance phase of walking. The first phase is at initial contact, and the second phase is during midstance. This 2-burst sequence could possibly reduce the load on associated contractile and noncontractile tissues and reduce injury risk. Perry reported similar tibialis posterior characteristics during the stance phase of walking. Franettovich et al found that when the lower leg was taped with the ALD, peak amplitude on electromyography of the tibialis posterior decreased, thus decreasing the level of activation while walking. When considered with the current results, those electromyography findings may be consistent with the idea that the COP changes associated with the APSS technique are related to potential changes in tibialis posterior activity. In other words, the APSS technique may assist the tibialis posterior in eccentrically contracting during 30% to 90% of stance and controlling pronation and arch collapse during stance. However, to conclusively determine the effectiveness of the APSS technique in supporting the tibialis posterior, electromyography data, in addition to the variables analyzed in the current study, would be necessary.

Of note, and despite small ESs, the ALD technique was not significantly effective at controlling ND nor at producing a later shift in COP in either the tape pre- and postexercise conditions. Reasons for this (particularly for COP position) may be attributable to neutral foot position during its application but are puzzling for ND. It is possible that, although there was a noted decrease in ND with the ALD technique, a low n led to insufficient statistical power to detect possible differences. Power analysis indicated a sufficient n would have been approximately 40 participants, which is surprising considering most similar studies had an n of 21 or fewer.

With respect to ND, findings in the current study are not consistent with other studies that have used ALD taping (even with small samples sizes) to alter foot position while walking. For example, Franettovich et al found that the ALD technique reduces activity of the tibialis posterior muscle during walking, while increasing arch height. They suggested that this provides evidence of the tibialis posterior’s role in reducing the load on the ankle and the foot. Franettovich et al further concluded that antipronation taping techniques have a beneficial impact on the biomechanics of the foot and ankle. Results from the current study are consistent with other studies that have suggested that antipronation taping can reduce foot pronation through the researchers’ APSS tape technique. In addition, these results support the idea that the APSS technique is at least as effective as the ALD described in many of the studies reviewed in Franettovich et al at controlling ND and foot position.

Similar to the current study, a study by Ator et al concluded that both of their antipronation tape techniques were initially effective in decreasing the ND prior to exercise and that both were unsuccessful in maintaining the initial height after a 10-minute bout of exercise. However, they also concluded that although the effects of the tape were diminished over time, the tape was likely still effective in controlling the motions that can predispose to injury (ie, by preventing the foot from entering the extreme end of pronation). Yoho et al also concluded that the tape effects diminish over time, but they may provide a short-term solution for “reducing pain, off-loading the plantar fascia following corticosteroid injection, simulating the benefits of orthotic support, and providing assistance on a short-term basis, such as an athletic activity practice, live game-time performance, or with certain occupational demands.” However, the APSS technique ES for barefoot to postexercise (ES = 1.15) remains large, and the ES is small from preexercise to postexercise (ES = 0.24). Thus, although the tape effectiveness does diminish over time, its overall treatment effect remains.

An initial concern about the APSS technique is that it requires the foot to be in an inverted position and that
may introduce additional risk for lateral ankle injury by shifting the COP line too far laterally. Results of the current study indicate that no additional lateral COP movement was noted, except in a more targeted portion of the stance phase (Figure 7). More research is needed to determine how this deviation compares with COP excursion in normal participants and whether the lateral deviation could possibly result in injury.

The results of the COP comparisons were made possible by the HRM data used in combination with a functional analysis and could have future implications for use in a variety of biomechanical studies. This technology has allowed the authors to examine the stance phase as a product of COP excursion in the horizontal plane, not just the vertical plane, such as with the ND test. This yields a more complete analysis of foot position throughout the stance phase. In addition, an ability to analyze data across time (ie, over the duration of stance phase) could allow researchers greater insights into the complex relationships between biomechanical movement and appropriate interventions. In the current study, transposing a set of discrete data points into a functional equation allowed for the examination of differences across the entire duration of the stance phase simultaneously, opposed to 1 moment in time or representing the entire stance phase as a single variable. This functional analysis provided the means to not only detect differences between tape techniques but also to narrow those differences to a specified interval of the stance phase. This level of sensitivity may hold promise for parsing out other biomechanical alterations due to injury, dysfunction, or overly restrictive taping techniques.

LIMITATIONS
Because the current study included only a physically active adult population, the generalizability of the results is limited to a population of similar age and fitness levels. Other limitations include tape type (Leukotape). Although some initial testing was performed on various other tapes, no empirical data were collected for a definitive comparison. Because the authors assumed that the tape applications can change the force that is transferred up the foot to the lower leg, more research is needed to determine the long-term effects of the APSS technique on the lower leg. Another limitation was the self-selected walking speed during the mat scan testing. Finally, although participants were measured barefoot for ND and COP, they did not exercise barefoot and thus there was no barefoot control for comparison across all treatments. The authors suggest that further testing in a variety of intensity levels in other physical activities and sports be conducted.

The exercise period was limited to only 15 minutes of walking. All tape tends to lose tautness over time. The authors saw that the APSS tape technique was superior to the ALD technique in the taped preexercise condition with respect to the ND and COP. After the 15-minute bout of exercise, the lateral excursion of the ALD and APSS techniques were statistically the same with respect to the COP, but the authors continued to observe a significant difference at the tape postexercise with respect to the ND. More research is needed to test with a shod foot.

IMPLICATIONS FOR CLINICAL PRACTICE
The results of the current study may hold some important implications for clinicians. The APSS technique was shown to effectively control ND (tape preexercise and tape postexercise) and COP trajectory during mid-stance at least as well as the standard ALD technique. These results also lend support to recent trends toward more minimal, but functional, taping techniques, such as those described by Alexander and Celiker et al. Part of this trend is made possible by relatively new types of tape, such as the Leukotape used in the current study and the study by Paris et al and kinesiological tape used in other studies, although Luque-Suarez et al reported that kinesiological tape has not been shown to decrease foot pronation. The authors of the current study recommend the APSS tape technique as a possible intervention strategy for conditions with characteristic ND and pes planus.

Comfort of the 2 tape techniques was also of interest to the researchers because it is an important issue with athletes. If the APSS is more comfortable, there is an increased likelihood that the athletes will wear it. The data indicate that the APSS technique was more comfortable than the ALD.

CONCLUSION
The purpose of the current study was to assess the effectiveness of the APSS taping technique, compared with the ALD technique, in reducing ND and increasing lateral shift of the COP. The authors hypothesized that the APSS technique would be as or more effective than the traditional ALD technique in controlling ND and cause a lateral shift in the COP during the stance phase. The authors observed changes in the ND and COP in the
preexercise condition. On the basis of these results, the APSS technique is recommended as a suitable alternative for incidence of MTSS. However, more research is needed to further test this taping technique in symptomatic individuals in real-world physical activity settings.

REFERENCES