



Research List

Performance and Safety:

Summary/conclusion	Outcome	Title/Citation
<i>Spraino does not affect handball cutting performance</i>	<p><i>Randomized cross-over Biomechanical trial:</i></p> <p>Investigating whether Spraino affects handball cutting performance:</p> <ul style="list-style-type: none"> • No change in contact time • No change in GRF • No change in ankle, knee, and hip joint kinematics and kinetics 	<p>Dziewiecki et al. <i>Effect of Slip Patches on Foot Contact Mechanics during a Handball Movement – A Pilot Study</i></p> <p>Proceedings of Annual Meeting of the Danish Society of Biomechanics, Hillerød, Denmark, Proceedings 11, 2016.</p>
<i>Spraino does not affect performance or safety when performing full-effort change-of-direction maneuvers</i>	<p><i>Randomized cross-over Biomechanical trial:</i></p> <p>Investigating whether minimized lateral shoe-surface friction affects performance in full-effort change-of-direction maneuvers:</p> <ul style="list-style-type: none"> • No change in contact time • No change in GRF • No change in ankle, knee, and hip joint kinematics and kinetics 	<p>Lysdal et al. <i>Minimizing shoe-surface friction at initial contact: A novel approach to prevent lateral ankle sprains</i></p> <p>ISBS – Conference Proceedings Archive: 35th International Conference on Biomechanics in Sports, 2017.</p> <p>Also presented at:</p> <p>Lysdal et al. <i>The effect of Spraino® Slide patches during 180° change of direction maneuvers</i></p> <p>Proceedings of the XXVI Congress of the International Society of Biomechanics, 2017.</p>
<i>Spraino is safe to use when doing indoor sports</i>	<p><i>Randomized cross-over Biomechanical trial:</i></p> <p>Investigating whether Spraino affects performance and safety during various indoor sport movements:</p> <ul style="list-style-type: none"> • No change in contact time • No change muscle activity patterns • Safe to use regardless of intensity and movement 	<p>Kersting et al. <i>The effect of Spraino® Slide patches on muscle activity and ankle joint loading during a turning maneuver</i></p> <p>Footwear Science 2017;9(sup1):131-132.</p>



Research List

Performance and Safety:

Summary/conclusion	Outcome	Title/Citation
<p><i>Spraino improves performance by making you faster playing badminton</i></p> <p><i>Spraino is safe to use in badminton</i></p>	<p><i>Randomized cross-over Biomechanical trial:</i></p> <p>Testing if reduced friction on the lateral edge of sports footwear affects performance and safety during full-effort simulated badminton match play:</p> <ul style="list-style-type: none"> • Strong tendency towards faster completion time ($p=.08$) • No change in ankle, knee, and hip joint kinematics • No sliding of the foot during the backhand forward lunge movement, despite initial ankle inversion • Safe to use in the demanding Badminton Speed Test, in which accidents previously have been observed. 	<p>- Full manuscript in preparation -</p> <p>Lysdal et al. <i>The influence of Spraino® on performance and safety in badminton</i> Proceedings of the 6th World Congress of Racket Sport Science, Bangkok 2018</p> <p>Also presented at:</p> <p>Lysdal et al. <i>Testing Spraino in a novel speed test for evaluation of badminton specific movements</i> Proceedings of the 14th Scandinavian Congress of Medicine & Science in Sports, 2018</p> <p>Lysdal et al. <i>The effect of Spraino® on performance in a novel speed test for evaluation of badminton specific movements</i> Book of Abstracts: The Science and Practice of Racket Sport for Improved Performance and Health, Sweden 2018</p>



Research List

Preventive effect:

Summary/conclusion	Outcome	Title/Citation
<p><i>Spraino safety release mechanism works by minimizing the horizontal Ground reaction force component – thus dropping the inversion moment close to zero.</i></p>	<p><i>Biomechanical Case Study:</i> Testing the proposed release mechanism in cutting maneuvers performed with exaggerated ankle inversion:</p> <ul style="list-style-type: none"> • More than 90% reduction of the injury promoting inversion moment <p>This mechanism can be triggered in case of severe ankle inversions at initial contact (e.g. when landing on a shoe).</p>	<p>Kersting et al. <i>Situation specific mechanisms of slip patches to prevent lateral ankle sprains</i> Proceedings of the 13th Scandinavian Congress of Medicine & Science in Sports, 2017</p>
<p><i>Spraino realignment mechanism can prevent non-contact ankle sprains</i></p>	<p><i>Biomechanical Case Study:</i> Testing the proposed realignment mechanism in cutting maneuvers with initial ankle inversion:</p> <ul style="list-style-type: none"> • The Spraino <i>realignment mechanism</i> works by bringing the GRF-vector close to the joint center • An eversion moment is triggered by the minimized friction at initial contact – this facilitates a realignment of the foot before full loading occurs. <p>This mechanism is triggered whenever foot strike is executed with an initial ankle inversion (awkward landings).</p>	<p>- Full manuscript in preparation -</p> <p>Lysdal et al. <i>Biomechanics of a lateral ankle sprain: and the effect of a minimized lateral shoe-surface friction</i> Proceedings of the International Foot and Ankle Biomechanics Meeting, i-FAB, New York, 2018</p> <p>Also presented at:</p> <p>Lysdal et al. <i>Biomechanics of a supination ankle sprain: a kinematic comparison of two identical awkward landings with and without Spraino</i> Proceedings of the 14th Scandinavian Congress of Medicine & Science in Sports, 2018</p>
<p><i>Spraino restores natural foot position:</i> <i>This happens through the realignment mechanism - that makes the GRF-vector pass through the lateral side of the joint center</i></p> <p>The realignment of the foot towards a stable position points towards a possible clinical relevance for indoor sports athletes - who are continuously at a high risk of noncontact ankle sprain injuries</p>	<p><i>Randomized cross-over Biomechanical trial:</i></p> <p>Minimized friction on the lateral edge initiated a complete change in frontal plane kinematics. The inversion angle further increased after initial contact in the control condition with a peak inversion velocity of 165°/s. In contrast, the foot was repositioned in 0.1 s with a peak eversion velocity of 247°/s</p>	<p>- Submitted -</p> <p>Lysdal et al. <i>A Kinematic Analysis of the Spraino® Realignment Mechanism during Simulated Noncontact Ankle Sprain Injuries</i> Footwear Biomechanics Symposium, Calgary 2019</p>



Research List

Preventive effect, clinical trials:

Summary/conclusion	Outcome	Title/Citation
<p><i>Spraino is very effective in ankle sprain injury prevention:</i></p> <p><i>Spraino is effective in preventing ankle sprains, reduce time-loss and reduce associated kinesiophobia and pain.</i></p>	<p><i>Randomized Controlled Trial (N=512)</i></p> <p>Preliminary intention-to-treat analysis confirms very significant results.</p>	<p>- Full manuscript in preparation -</p> <p><i>A Randomized Pilot Trial to Evaluate the Preliminary Effect and Safety of Using Spraino® to Prevent Lateral Ankle Sprains in Indoor Sports (The Spraino Pilot Trial)</i></p>



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Additional Spraino research:

Summary/conclusion	Outcome	Title/Citation
<p><i>Ankle sprain injuries and recurrences are extremely prevalent among indoor sports participants.</i></p> <p><i>Especially a problem in handball and basketball (78%)</i></p> <p><i>Younger athletes are more prone to injury!</i></p>	<p>National survey among elite indoor sports participants:</p> <p>Prevalence and demographic risk factors associated with ankle sprains in indoor sports. (N=1238)</p> <ul style="list-style-type: none"> • 73.7% of the Danish indoor sports participants have suffered a sport-related ankle sprain injury <ul style="list-style-type: none"> • 78.2% in Handball • 78.3% in Basketball • 51.2% in Badminton • Most ankle sprains are non-contact 	<p>- Full manuscript in preparation -</p> <p>Petersen et al. <i>Ankle Sprain Injuries in Indoor Sports: A Survey among 1238 Danish Elite and Sub-elite Athletes.</i></p> <p>Proceedings of the 15th Scandinavian Congress of Medicine & Science in Sports, 2019</p>
<p><i>91% have tried to prevent new ankle sprain injuries</i></p> <p><i>Almost everyone stopped using preventive measures against ankle sprains prematurely – with more than 72% stopping within 3 months.</i></p>	<p>National survey among 400 elite indoor sports participants with previous ankle injuries.</p> <ul style="list-style-type: none"> • 90.7% of the Danish indoor sports participants with previous ankle injury have used a measure to prevent recurrent ankle sprains • 72.8% stopped using their preventive measure of choice within 3 months - due to not feeling a need anymore! • Less than 2% followed the current clinical guidelines on best practice <p>76% of 400 elite indoor sports athletes stopped using preventive measures within 3 months following their most recent ankle sprain. They stopped due to a perceived lack of need or efficacy</p>	<p>- Full manuscript in preparation -</p> <p>Østergaard et al. <i>Routine Use and Satisfaction of Measures for the Prevention of Ankle Sprain Injuries in Indoor Sports</i></p> <p>Proceedings of the 15th Scandinavian Congress of Medicine & Science in Sports, 2019</p>