

Baseline MRI findings were not associated with re-injury (all,  $p > 0.05$ ).

**Conclusions** Presence of aponeurotic disruption and a running-related mechanism of injury resulted in longer return to play times for soleus injuries. Only clinical data, not MRI characteristics, were associated with risk of re-injury.

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### CRITERIA-BASED RETURN TO SPORT DECISION-MAKING FOLLOWING LATERAL ANKLE SPRAIN INJURY: A RELEVANT PART OF THE PREVENTION – PERFORMANCE PARADOX FOR SECONDARY AND TERTIARY INJURY PREVENTION?

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**Background** Lateral ankle sprain (LAS) injury is one of the most frequently incurred musculoskeletal injuries and shows high recurrence rates in individuals participating in sports. This increased re-injury risk is hypothesised to be mainly caused by the persistence of sensorimotor impairments and premature return to sport (RTS) clearance. Therefore, it is indicated to develop and implement evidence-based criteria to guide RTS decisions for LAS patients in order to minimize re-injury risk and maximise performance.

**Objective** To identify prospective studies that used a criteria-based return to sport decision-making process for LAS patients.

**Design** Systematic review.

**Setting** Secondary and tertiary injury prevention.

**Patients** LAS patients.

**Main Outcome Measurements** Studies were included if they prospectively applied a criteria-based RTS decision-making process for LAS patients.

**Results** No relevant studies could be identified. However, we retrieved 47 relevant questionnaires, as well as 45 clinical and functional assessments commonly used in studies during the search process.

**Conclusions** There are currently no published evidence-based criteria to inform RTS decisions for LAS patients. It seems that RTS decisions following LAS injury are still generally time-based. We propose seven variable categories that could be used to develop a criteria-based RTS decision paradigm. These categories were generated in accordance with our results (i.e. questionnaires and tests) and the latest scientific insights. In summary, RTS decisions should acknowledge both preventive and performance criteria. Finding the right balance between these two divergent purposes within the rehabilitation process, is essential in order to minimize the athlete's re-injury risk and maximise performance. It is thus of paramount importance that all relevant stakeholders (e.g. athlete, medical staff,

coaching, staff) take part in the RTS decision-making process. Future research should aim to reach consensus on these variables and apply them to actual RTS decisions within prospective study designs to evaluate re-injury risk and successful return to performance.

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### HEAVY SHOULDER STRENGTHENING EXERCISES IN PATIENTS WITH HYPERMOBILITY AND LONG-LASTING SHOULDER SYMPTOMS: A FEASIBILITY STUDY

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**Background** Patients with hypermobility spectrum disorder (HSD) are in great risk of experiencing shoulder symptoms, but evidence for exercise as treatment is sparse.

**Objective** To evaluate the feasibility of heavy shoulder strengthening exercise in patients with HSD and long-lasting shoulder symptoms.

**Design** Feasibility study.

**Setting** Primary care.

**Patients (or Participants)** Twelve patients (39.3±13.9 years) with HSD and shoulder instability and/or pain >3 months.

**Interventions (or Assessment of Risk Factors)** 16-week progressive heavy shoulder strengthening programme 3 times/week using exercises targeting scapular and rotator cuff muscles.

**Main Outcome Measurements** Pre-defined progression criteria included recruitment rate (acceptable: 6 patients/month), test duration (acceptable: <120 min), patient retention (acceptable: >80% complete intervention), training adherence (acceptable: >75% adhere to >36 training sessions), adverse events (acceptable: minor events with no patients discontinuing the study), besides patient and physiotherapist feedback. Treatment outcomes were assessed using patient-reported health parameters, such as the Western Ontario Shoulder Instability Index (WOSI (0–2100, better to worse)), outcomes on pain, fatigue and kinesiophobia, besides isometric shoulder strength and clinical tests (shoulder instability, hypermobility and proprioception).

**Results** Recruitment rate was 5.6/month, assessment duration (mean±SD) 105±9 min, retention 100%, adherence 83%, and four patients experienced short-lasting soreness/pain. Patient feedback was positive, and physiotherapists found the intervention relevant and applicable to the patient-group. WOSI total score improved by 51% (mean±SD, points: baseline 1037±215; follow-up 509±365; mean change (95% CI), 528 (318; 738)), and patients reported reduced pain, fatigue and kinesiophobia. Shoulder strength measurements improved by 28–31% (mean change (95% CI), Nm/kg: scaption 0.51 (0.23; 0.78); internal rotation 1.32 (0.70; 1.95); and external