Assessment of Risk Factors History of ankle sprain in the past year was defined in a time-dynamic manner as any bilateral ankle sprain (game or non-game) in the 365 days prior to the game of interest. Hazard ratios (HR) and 95% confidence intervals (CI) were calculated while controlling for years in the NBA, body mass index, and average NBA minutes played in the prior year.

Main Outcome Measurements All acute-onset ankle sprains reported in games were identified from the NBA standardized electronic medical record (n=30 teams).

Results Across this 4-season study, 482 incident ankle sprains were reported in NBA games among 681 players and 2,517,549 player-minutes. Of the players that sustained an incident sprain, 44% (n=211) had at least one ankle sprain in the prior year. Compared to players with no sprains in the past year, the risk of incident ankle sprain increased with increasing number of prior ankle sprains; a 28% increase in risk (adjHR=1.28, 95% CI 1.03, 1.58) with one prior sprain, a 51% increase in risk (adjHR=1.51, 95% CI 1.10, 2.04) with two prior sprains, and a 100% increase in risk (adjHR=2.00, 95% CI 1.31, 2.94) with three or more prior sprains.

Conclusions History of ankle sprain in the past year was associated with increased risk of incident ankle sprain among NBA players. 44% of players had at least one ankle sprain (game or non-game) within one year prior to the incident sprain.

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AN UNSUPERVISED E-HEALTH SUPPORTED NEUROMUSCULAR TRAINING PROGRAM IS NOT EFFECTIVE IN THE PREVENTION OF RECURRENT ANKLE SPRAINS IN PATIENTS IN PRIMARY CARE: THE TRAPP-STUDY

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Background Ankle sprains are one of the most frequent injuries of the musculoskeletal system. No optimal treatment strategy has proven to be effective in general practice, however promising results were achieved in a preventive trial among athletes

Objective To examine the effectiveness of an unsupervised e-health supported neuromuscular training program in combination with usual care in general practice compared to usual care alone in patients with acute lateral ankle sprains in general practice

Design Randomised Controlled Trial

Setting Primary care

Patients (or Participants) Patients (14–65 years) who visited a general practitioner with an acute lateral ankle sprain within three weeks of injury

Interventions (or Assessment of Risk Factors) The intervention group received, in addition to usual care, an unsupervised e-health supported neuromuscular training program, and the control group received usual care alone

Main Outcome Measurements The primary outcome was self-reported recurrent sprains during follow-up. Secondary

outcomes were ankle function (Ankle Function Score 0–100), pain in rest and during activity (numerical rating scale 0–10), subjective recovery and return to the same type and level of sport.

Results 165 participants were included with a mean age of 38.3 (SD 14.2) years and 41.8% were male. No difference in the occurrence of a recurrent sprain was found between the intervention (n=17; 20.7%) and control group (n=20; 24.1%) (HR 1.14; 95% CI 0.59–2.21). Also, no differences in secondary outcomes were found between groups. The compliance rate with the program was low (6.1%).

Conclusions Although the recurrence rate of ankle sprains was relatively high, an unsupervised e-health supported neuromuscular training program is not effective in preventing recurrent sprains in patients with an acute lateral ankle sprain in general practice. More research is necessary to indicate the best treatment modality for this group of patients.

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UNDERSTANDING THE IMPACT OF ANKLE INJURIES AMONG CONTEMPORARY PRE-PROFESSIONAL DANCERS: INCIDENCE AND RISK FACTORS

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Background Ankle injuries are common injuries among pre-professional dancers. An overview of the incidence and risk factors is however lacking.

Objective To examine the incidence and risk factors of ankle injuries among contemporary pre-professional dancers.

Design Prospective cohort study.

Setting Codarts University of the Arts, Rotterdam, The Netherlands.

Patients (or Participants) 91 first-year contemporary pre-professional dancers, from Bachelor Dance (n=59) and Bachelor Dance Teacher (n=32) were included.

Interventions (or Assessment of Risk Factors) At the start of the academic year all dancers completed a questionnaire, underwent a physical screening measuring the ankle range of motion (ROM) and dorsiflexion. During the academic year, all dancers completed monthly questionnaires on the occurrence of an ankle injury that were referred to in the Oslo Sports Trauma Research Center (OSTRC) questionnaire. Injuries were defined into substantial injuries (score ≥ 13 on question 2 or 3 of OSTRC questionnaire), injuries leading to medical attention and to dance time-loss. Potential risk factors for an ankle injury included dancer characteristics, history of ankle injury in previous year, ankle ROM and dorsiflexion.

Main Outcome Measurements The number of self-reported ankle injuries during one academic year.

Results 17 (18.7%) dancers reported an ankle injury, with a total of 33 injuries. Of these dancers reporting an ankle injury, 82.4% led to dance time-loss (mean number of 19.9 days unable to fully participate), 47.1% to medical attention and 41.2% were substantial injuries. No significant risk factors for ankle injuries could be identified.

Conclusions Almost 20% of first-year pre-professional dancers reported an ankle injury, with more than 80% of these injuries leading to dance time-loss. No significant risk factors could be identified for ankle injuries throughout the academic year. Since ankle injuries are common among dancers, research in larger dance populations with longer term of follow-up, including relevant risk factors, is necessary to evaluate the impact of these injuries further.

111 EPIDEMIOLOGY OF ANKLE SPRAINS IN ELITE HIGH SCHOOL BASKETBALL PLAYERS: MEDICAL AND PHYSICAL CHECKUP REPORT, RELATIONSHIPS BETWEEN PREVALENCE OF ANKLE SPRAINS, UNSTABLE SENSATION, ATFL PATHOLOGY AND THE BALANCE TEST

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Background Ankle sprains are the most common injury among basketball players. However, a number of athlete report persisting symptoms which can lead to the chronic ankle instability (CAI), even worse, their articular cartilage damage.

Objective To investigate the prevalence of ankle sprains and the relationships between recurrence, perceived instability, ATFL pathology, range of motion and the balance test among elite high school basketball players.

Design Cross-sectional study.

Setting High school national championship tournament in 2017.

Patients (or Participants) All players who voluntarily participated in our checkup.

Interventions (or Assessment of Risk Factors) Questionnaire, ultrasonographic examination for anterior talofibular ligament (ATFL) pathology, ankle dorsi-flexion (DF) angle measurement and star excursion balance test (SEBT).

Results We received the responses from 1013 players (330 male and 683 female players). It revealed that 74.3% of males and 82.7% of females had injured their ankle at least once and recurrence rate was 59.6% and 63.0% respectively. 79.3% of players were injured before 16 years of age. Fifty-two male and 77 female players completed all examinations. It was revealed that the players who had recurrent sprains suffered more severe ATFL injuries and felt unstable sensation in their ankle compared with the players without sprain. Players who got ATFL tear had smaller DF angle significantly. Additionally, DF angle significantly correlated with the reach of SEBT. Logistic regression analysis indicated that ATFL tear and Unstable sensation were significantly associated with recurrent sprains, and multiple regression analysis revealed that DF angle and gender were only variables to predict SEBT length.

Conclusions Prevention of the CAI should be focused on the following 3 points: 1) Education for younger, pre-injury age, 2) Treatment just after their first injury with an emphasis on the ATFL healing and range of motion restoration, 3) Appropriate exercises and/or equipment for prevention from recurrence.

112 ACUTE EFFECTS OF WARMING UP ON ACHILLES TENDON BLOOD FLOW AND STIFFNESS

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Background The influence of warm-up exercises on the muscle properties has already been investigated before. Strikingly, it still remains unclear which warm-up exercises should be performed in order to properly prepare the Achilles tendon in withstanding high-forces during sport participation.

Objective To investigate the acute effect of frequently used warm-up exercises on the Achilles tendon blood flow and stiffness.

Design A within-subject repeated-measure design.

Setting Knowledge about which exercises are suitable to prepare the athlete's Achilles tendon in withstanding high amounts of loading during sport activities could help sport physicians and physiotherapists when recommending warm-up exercises that are able to improve sport performance while reducing the injury susceptibility. This study was conducted at the department of Rehabilitation Sciences at Ghent University.

Participants All 40 participants performed at least 1 hour of weekly sports participation and were excluded from this study if they had a history of lower extremity injuries within the previous year.

Assessment Achilles tendon blood flow and stiffness measurements were obtained before and immediately after four different warm-up exercises: running, plyometrics, eccentric heel drops and static stretching. The effect of these warm-up exercises and possible covariates on the Achilles tendon blood flow and stiffness was investigated with linear mixed models.

Main Outcome Measurements Achilles tendon blood flow and stiffness.

Results The results showed a significant increase in Achilles tendon blood flow and stiffness after 10 minutes of running ($p < 0.001$ and $p < 0.001$) and plyometrics ($p < 0.001$ and $p = 0.039$). Static stretching and eccentric exercises elicited no significant changes.

Conclusions It could be suggested that warm-up exercises should be intensive enough in order to properly prepare the Achilles tendon for subsequent sport activities. When looking at Achilles tendon blood flow and stiffness, we advise the incorporation of highly intensive exercises such as running and plyometrics within warm-up programs.

113 THE USE OF INERTIAL MEASUREMENT UNITS FOR ANALYZING CHANGE OF DIRECTION MOVEMENT IN SPORTS: A SCOPING REVIEW

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Background Research on change of direction movement (COD) has focused on factors related to performance and injury prevention or rehabilitation. Wearable devices are used