

healthy counterparts, soldiers with CAI performed better on the AMEDA at the start and 14 -week testing points.

**Discussion:** Ankle instability restricts agility gains in soldiers during 14-weeks of physical training but has no effect on 3,000m running performance. Soldiers with CAI perform worse in YBT balance tests, in the Anterior and PM directions particularly. Soldiers with CAI have better somatosensory acuity than those with stable ankles, despite the CAI association with worse performance in other tests. This heightened somatosensory awareness may enable them to compensate for lower performance in other tests.

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### S107

#### The risk of injury in the first five years of an Australian football career – Can it be predicted without using player load?

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**Background:** The concept of predicting injury risk has been criticised (Bahr, 2016), however research using machine learning methods has demonstrated that it is possible to predict injury risk in basketball (Talukder 2016a) and soccer (Talukder 2016b). Player load is by far the strongest injury risk factor (Rossi 2018), however player load data may not always be available for analysis and the prediction of risk. The aim of this study was to investigate whether player characteristics alone, could be used to predict injury risk in the first five seasons of an Australian football player's professional career.

**Methods:** The data represented 1033 unique AFL players, who sustained 4762 injuries in seasons 1997-2016. Player characteristics (height, body mass, age, playing position, indigenouness & natural kicking foot) and the injury characteristics of the previous season, were used in models to predict injury risk.

**Results:** A Naïve Bayes model that was based on player characteristics alone was able to classify injury risk category (low, medium, high) over 5 years, 1.3 times better than random chance. The characteristics of; playing position, height and body mass contributed to 97% of the prediction of injury risk category. A Decision Tree model that classified injury risk category in a single season, based on the characteristics of a player and their injuries in the previous season, performed 1.4 times better than random chance. When the models were used to predict whether a player would be in the highest risk category, the performance of both models increased to 1.9 and 2.2 times better than random chance. Taller and heavier key position players who sustained hamstring strain and groin strain/osteitis pubis injuries in the previous season had a higher injury risk than shorter and lighter non-key position players who remained injury-free in the previous season.

**Discussion:** The injury prediction models reported here did not perform as well previously reported models that were based on training load. Nevertheless, they demonstrate how player characteristics affect injury risk and the models themselves can be used "live" to stratify injury risk, which can then be used to help clinicians make decisions about risk mitigation strategies such as prehabilitation.

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### S108

#### Light to vigorous exercise up-regulates TERT gene expression and telomerase in numerous tissues

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**Background:** Telomeres are a repeat sequence of DNA (in mammals, TTAGGGn) found at the distal ends of chromosomes that protect genomic integrity. Telomeres gradually shorten with each round of cell division which ultimately reduces tissue vitality. Short leukocyte telomeres are often observed in patients with age-related and degenerative diseases, and accelerated telomere shortening is associated with adverse lifestyle factors, such as psychological distress. Telomerase is an enzyme capable of lengthening telomeres. To that end, we conducted a systematic review and meta-analysis to determine the effects of acute exercise and chronic exercise training on telomerase reverse transcriptase (TERT) gene and telomerase enzyme activity in healthy humans and rodents.

**Methods:** We conducted a systematic review and meta-analysis as per the PRISMA guidelines. A comprehensive search of the available literature involving the analysis of the acute and/or chronic exercise training-induced changes in TERT gene and telomerase activity in healthy tissues from humans and rodents was performed using four online databases. Studies were screened according to the inclusion/exclusion criteria before a quality assessment was conducted using the Cochrane risk of bias tool. The meta-analytical procedures were performed using the Review Manager software (version 5.4). We also analysed the TERT gene and telomerase activity in endurance athletes compared to untrained controls from relevant studies.

**Results:** The meta-analytical findings from the five eligible investigations indicated that acute aerobic exercise leads to a very large increase in TERT gene and telomerase activity (standardised mean difference [SMD]: 1.19,  $P < .01$ ). The results from ten chronic aerobic exercise training interventions revealed that training induces a small to medium increase in TERT gene and telomerase activity (SMD: 0.31,  $P < .05$ ). Relative to untrained controls, endurance athletes possessed much higher levels of TERT gene expression and telomerase activity.

**Discussion:** Exercise training is associated with telomere maintenance in the heart, aorta and leukocytes. Our findings suggest both acute and chronic exercise training, as well as long-term endurance training is associated with up-regulated TERT gene and telomerase activity in healthy cells. Importantly, relatively light aerobic exercise and as little as 20 minutes was associated with increased TERT/telomerase activity. Telomerase regulation likely underpins the attenuated telomere attrition associated with exercise training in humans and rodents.

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### S109

#### Do the adverse physical effects of breast cancer surgery affect participation in physical activity and sport?

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**Background:** Women living with breast cancer are encouraged to participate in physical activity to maximise their disease prevention and health promotion. Little is known, however, of the extent that exercise