performed maximal contractions (×3) of an isokinetic knee extension/flexion exercise on a Cybex dynamometer at velocities of 30° · s^{-1} and 240° · s^{-1}. On the second visit, maximal bilateral and unilateral countermovement (×3) and drop jump (×3) trials were performed on a force platform (Kistler, 1000 Hz) with lower-body kinematics being concurrently recorded in the frontal plane using a high-speed video camera (Fastec TS3-39, 100 Hz). Independent *t*-tests examined gender differences in performance ($P < 0.05$) and Pearson's correlations (two-tailed) examined relationships between isokinetic performance and lower-body jumping kinematics. Females (4.77° ± 14.20°) displayed significantly greater knee valgus on landing from a bilateral drop jump than males (−15.82° ± 10.49°, $P < 0.05$). Importantly, knee valgus during the stance phase of the drop jump displayed a significant negative correlation with concentric hamstring-to-quadriceps ratio (H:Q ratio) at 30° · s^{-1} ($r = -0.60$, $P < 0.05$). There was a tendency for females (51.83 ± 6.85% and 53.83 ± 6.85%) to display lower H:Q ratios than males (56.83 ± 55.42% and 58.17 ± 10.07%) at 30° · s^{-1} and 240° · s^{-1}, respectively; however, this was not statistically significant. Furthermore, there were no significant differences in leg dominance between males and females ($P > 0.05$). Despite the higher knee injury incidence in females, significant differences were only observed between males and females in landing kinematics during jumping tasks. Present findings suggest that knee joint kinematics adopted by females may be partially explained by quadriceps-dominant characteristics. Although the link between knee joint kinematics and ACL injuries requires further investigation, the present findings highlight that examination of two-dimensional knee joint kinematics during jumping assessments may provide a useful means of identifying potential injury risk factors for coaches working in an applied setting.

032. Effects of ankle bracing on ground reaction forces during cricket bowling and cricket-specific sprinting and agility performance measures

ADAM HAWKEY[1,2]*, COURTNEY WILKINSON[1], ASHLEY RICHARDSON[1], IAN GIBBS[2] & GRAHAM ARNOLD[2]

[1]*Abertay University*; [2]*University of Dundee*
*Corresponding author: a.hawkey@abertay.ac.uk
@a_hawkey

The ankle joint is the most common injury site in cricket (Fong *et al.*, 2007, *Sports Medicine*, 37(1), 73–94). While previous research has reported a reduction in injury risk with the application of a semi-rigid ankle brace (Hawkey *et al.*, 2012, *Journal of Sports Therapy*, 5(1), 33–40), there is limited research into the effects of ankle bracing on ground reaction forces (GRFs) during bowling and on cricket-specific performance. Therefore, the current study was designed to investigate the effects of wearing ankle braces on both GRF and performance in cricket. Following institutional ethics approval, 20 male university cricket players (age 20 ± 2.5 years, height 1.78 ± 0.2 m, mass 75 ± 5 kg; Mean [SD]) performed three trials, in both braced (Aircast A60) and non-braced conditions, in each of two cricket performance tests: 20 m sprint (simulating a single run between the wicket) and an adapted 505 agility test (imitating a turn at the wicket), in accordance with Hawkey et al. (2009, *Journal of Sports Sciences*, 27(4), S137). A paired samples *t*-test reported a statistically, but not practically, significant difference ($P < 0.001$) between the 30 m sprint times in the braced (3.33 ± 0.26 s) and non-braced (3.32 ± 0.26 s) conditions. However, no significant difference ($P = 0.29$) was found between the agility times for the braced (2.38 ± 0.1 s) and non-braced (2.36 ± 0.1 s) conditions. Of these 20 participants, six bowlers then delivered an over (six balls), with the foot of their supporting leg contacting a force platform during ball release, in both braced (Aircast A60) and non-braced conditions. An independent samples *t*-test revealed no significant difference between the vertical ($P = 0.418$), anterior-posterior ($P = 0.181$) and the mediolateral ($P = 0.830$) GRFs in the braced and non-braced conditions. The results show no reduction in GRF with the application of an ankle brace, possibly due to the linear nature of the bowling action. However, the non-significant effect on cricket-specific performance, which is comparable to the results of previous cricket-based research (Hawkey et al., 2009, *Journal of Sports Sciences*, 27(4), S137), suggests that cricketers may benefit from wearing ankle braces to reduce the potential risk of an ankle injury.

033. Gender differences in patellar tendon kinetics during running

JONATHAN SINCLAIR* & PAUL JOHN TAYLOR

University of Central Lancashire
*Corresponding author: jksinclair@uclan.ac.uk

It has been shown that 19.4–79.3% of all who participate in recreational running activities will suffer from a chronic pathology over the course of 1 year (Van Gent et al., 2007, *British Journal of Sports Medicine*, 41, 469–480). Female runners are known to be at increased risk from chronic injuries in relation to males, with the knee being the most common injury site (Robinson and Nee, *JOSPT*, 37, 232–238). There is currently a paucity of information regarding the influence of gender on the loads experienced by the patellar tendon during running. The aim of the current investigation was, therefore, to determine whether female recreational runners exhibit distinct patellar tendon loading patterns in relation to their male counterparts. Twelve male (age 26.55 ± 4.11 years, height 1.78 ± 0.11 m, mass 77.11 ± 5.06 kg) and 12 female (age 26.67 ± 5.34 years, height 1.67 ± 0.12 m, mass 63.28 ± 9.75 kg) runners ran over a force platform which operated at 1000 Hz, at 4.0 m . s^{-1}. Ethical approval was granted by the author's institution. Lower limb kinematics were collected using an eight-camera optoelectric motion capture system which operated at 250 Hz. Patellar tendon loads were examined using a predictive algorithm, whereby the knee extensor moment was divided by the patellar tendon moment arm (Janssen et al., 2012, *Medicine and Science in Sports Exercise*, 45, 927–934; Herzog and Read, 1993, *Journal of Anatomy*, 182, 213–230). Sex differences in patellar tendon loads were examined statistically using independent samples *t*-tests. The results indicate that peak patellar tendon force (male = 6.49 ± 2.28 and female = 7.03 ± 1.35 BW) and patellar tendon loading rate (male = 92.41 ± 32.51 and female = 111.05 ± 48.58 BW . s^{-1}) were significantly higher in female runners. On the basis that patellar tendon pathology is considered to be a function of excessive tendon loading, the current study indicates that female runners may be at increased risk of patellar tendon pathologies.

034. Influence of footwear temperature on the kinetics and kinematics of running

JONATHAN SINCLAIR*, SARAH JANE HOBBS & HANNAH SHORE

University of Central Lancashire
*Corresponding author: jksinclair@uclan.ac.uk

The most frequently utilised material for running shoe midsoles is a copolymer called ethylene-vinyl acetate. Like most polymers, ethylene-vinyl acetate exhibits viscoelastic properties (Knauss et al., 2008, *Mechanics of Polymers*: *Viscoelasticity* (pp. 49–96). Springer). It has long been established that the mechanical properties of most polymers are highly temperature dependent (Dib et al., 2001, *Journal of Sport Medicine*, 15, 172–176); at lower temperatures, the materials become less elastic, whereas the opposite occurs at higher temperatures. As such, it has been proposed that the cushioning characteristics of running shoes may differ in different environmental temperature conditions. The aim of the current investigation was to examine the effects of cooled footwear on the kinetics and kinematics of running in comparison to footwear at normal temperature. Twelve participants (age 21.45 ± 2.98 years, height 1.66 ± 0.06 m, mass 60.87 ± 4.37) ran at 4.0 m · s^{-1} ± 5% in both cooled and normal temperature footwear conditions over a force platform (1000 Hz). Ethical approval was granted by the author's institution. Two identical footwear were worn, one of which was cooled for 30 min. Lower extremity kinematics were obtained using a motion capture system (250 Hz), and tibial accelerations (1000 Hz) were measured using a tri-axial accelerometer. Differences between cooled and normal footwear temperatures were contrasted using paired samples *t*-tests. The results showed that midsole temperature (P = 0.004) and deformation (P = 0.001) were significantly reduced in the cooled footwear. In addition, instantaneous loading rate (P = 0.02), peak tibial acceleration (P = 0.01) and tibial acceleration slope (P = 0.007) were significantly greater in the cooled footwear. Finally, peak eversion (P = 0.02) and tibial internal rotation (P = 0.01) were also shown to be significantly larger in the cooled footwear condition. This study indicates that running in cooler footwear places runners at greater risk from the kinetic and kinematic parameters linked to the aetiology of injuries.

035. The effect of a real-time gait-retraining programme on knee angle and ground reaction forces in a group of recreational runners

LOULIA HADJIIOANNOU, ANDREW BARNES*, SEAN CLARKSON & JONATHAN WHEAT

Sheffield Hallam University
*Corresponding author: a.barnes@shu.ac.uk

Gait-retraining using real-time visual feedback is an effective intervention for modifying factors