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**Background:** The Coronavirus pandemic (COVID-19) has brought about significant change to athletes, with the postponement and cancellation of competitions and performances. This has created a need to proactively adapt to ensure peak mental and physical fitness. This requirement to adapt may be even more relevant for those athletes rehabilitating from injury during the pandemic. This qualitative study sought to explore the experiences of student circus arts performers with atraumatic shoulder instability undertaking a 12-week shoulder rehabilitation program during the Melbourne COVID-19 pandemic lockdown.

**Method:** Fourteen circus arts students from the National Institute of Circus Arts were interviewed via teleconsultation. Semi-structured interviews were recorded, transcribed and analysed using inductive thematic analysis.

**Results:** Five overarching themes were identified: impact (physical and mental), opportunity, developing routine, client-therapist relationship, and transformation. All participants reported positive physical changes to their shoulder including increases in strength, stability, range of motion, less pain, “clicking” and “clunking”, improved posture, muscle memory as well as carry-over to functional circus activities. The pandemic’s mental impact varied across the cohort, with positive and negative experiences described in relation to cognitive, social and affective factors. Most performers felt the pandemic provided an opportunity to focus on rehabilitation of their shoulder. Program effects were underpinned by positive client-therapist relationships and a progressive transformation of learning where students gained knowledge, and strategies for short and long-term management of their condition.

**Discussion:** The COVID-19 pandemic provides a unique opportunity for individuals to undertake injury rehabilitation during an absence of usual training and performance. Rehabilitation for atraumatic shoulder instability can be delivered effectively via teleconsultation to improve subjectively reported physical function and long-term management of atraumatic shoulder instability, facilitated by strong client-therapist relationships and a structured rehabilitation program.

**Conflict of interest statement:** My co-authors and I acknowledge that we have no conflict of interest of relevance to the submission of this abstract.

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S99

### **Bridging the gap between attitudes and action: Opportunities for the cancer care workforce to support exercise counselling and referral**

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**Background:** The majority of the cancer care workforce have favourable attitudes and opinions of exercise for cancer patients, and report that exercise is safe and beneficial; nevertheless, insufficient time and uncertainty of what to recommend are reported as common barriers to discussing and/or counselling their patients about exercise. The limited research about cancer care clinician’s communication with their patients about exercise suggests that a timely discussion about regular exercise can be reassuring, informative and motivational for patients. This study aimed to 1) understand the factors impacting the implementation for

exercise communication and referral, and 2) explore and initiate co-ordinated and integrated clinical approaches to exercise communication and referral.

**Methods:** Seven focus groups were conducted with cancer care clinicians and practitioners (N=53) (i.e., oncologists, haematologists specialising in cancer, oncology nurses, physiotherapists, exercise physiologists, social workers and psychologists) working with cancer patients throughout Sydney, Australia. In addition, a sub-sample of participants (n=9) attended a half-day workshop focused on identifying best practice approaches for moving forward. Thematic content analysis was utilised to analyse the data.

**Results:** Two overarching themes, and associated subthemes, emerged from the data: 1) Factors impacting the knowledge-to-action gap, highlights the challenges and barriers clinicians and practitioners face in implementing exercise counselling and a referral pathway; inclusive of the funding structure, current referral process (i.e., only available via general practitioner/Medicare), lack of exercise specific knowledge and education to confidently advice/counsel patients, limited access and opportunity for professional development/training specific to exercise for cancer care, and 2) Recommendations for a consistent and efficient way forward, describes an action-orientated exercise counselling and referral pathway approach; inclusive of an oncologist-initiated brief communication exchange, distribution of a variety of cancer-specific, tailored exercise resources for patients (e.g., videos, online, hard copy), access to exercise physiologists with cancer care expertise, initial exercise consultation prompted by exercise physiologist.

**Discussion:** This study has identified important factors influencing exercise counselling and referral by the cancer care workforce, and potential approaches for incorporating exercise into standard cancer care. A model for an exercise referral pathway is provided to guide implementation, inclusive of oncologist-initiated communication exchange, relevant resources, and access to exercise practitioners with cancer expertise. Future testing is required to determine feasibility and practicality of these approaches.

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S100

### **Influence of age on arterial stiffness responses following a short period of sitting in healthy males**

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**Background:** Age-related increases in arterial stiffness including carotid-femoral pulse wave velocity (cf-PWV), aortic wave reflection via augmentation index (AIx) and reflection magnitude (RM) have been associated with future cardiovascular event risk. Chronic or prolonged inactivity has been reported to exacerbate the age-related increases in arterial stiffness. However, little is known about the impact of a short, period of inactivity on arterial stiffness with age potentially an influencing factor. The aim of this study was to examine the effect of age on the acute, arterial stiffness responses following a short period of sitting in healthy males.

**Methods:** Twenty-two young (27.1±7.3 yrs, 177.4±5.4 cm, 82.2±10.2 kg, 26.1±3.1 kg.m<sup>-2</sup>) and twenty-two older (68.8±5.3 yrs,

174.6±7.6 cm, 77.7±7.0 kg, 25.6±3.0 kg.m<sup>-2</sup>) males volunteered. Supine, resting measures of cf-PWV, Alx corrected to a heart rate of 75 (Alx75) and RM were obtained prior to (baseline), and 20-, 40- and 60-minutes following a short period of sitting (24-30 minutes). Heart rate (HR), systolic (SBP), diastolic (DBP) and mean arterial (MAP) blood pressure were recorded throughout the sitting period. Significant ( $p<0.05$ ) differences over time and between groups were examined by 2-way ANOVA and post-hoc, pairwise comparisons with Bonferroni correction.

**Results:** During the short period of sitting, lower HR ( $53.9\pm 8.0$  vs.  $64.6\pm 7.7$  bpm,  $p<0.001$ ) and greater peripheral SBP ( $131.2\pm 13.1$  vs.  $118.8\pm 9.6$  mmHg,  $p<0.001$ ), DBP ( $79.9\pm 8.7$  vs.  $74.7\pm 6.4$  mmHg,  $p=0.027$ ) and MAP ( $97.0\pm 9.2$  vs.  $89.4\pm 7.0$  mmHg,  $p=0.003$ ) were observed in the older compared to the young group. The older group exhibited significantly greater resting cf-PWV ( $9.0\pm 1.4$  vs.  $7.3\pm 0.9$  m.s<sup>-1</sup>,  $p<0.001$ ), Alx75 ( $12.6\pm 9.2$  vs.  $4.0\pm 14.0$  %,  $p=0.011$ ) and RM ( $73.6\pm 14.0$  vs.  $59.0\pm 12.4$  %,  $p<0.001$ ), and lower HR ( $48.9\pm 6.4$  vs.  $55.0\pm 7.7$  bpm,  $p=0.002$ ) compared to the young group. Compared to baseline, cf-PWV was significantly increased at 60-minutes after the sitting period ( $p<0.05$ ) with the change being similar between groups ( $p=0.792$ ). In contrast, Alx75 and RM were significantly decreased at 40- and 60-minutes after sitting ( $p<0.05$ ) with the change being similar between groups ( $p>0.05$ ).

**Discussion:** A short period of sitting resulted in a significant increase in central arterial stiffness (cf-PWV) and a concurrent decrease in peripheral arterial stiffness (Alx75 and RM) with these responses being unaffected by age in healthy males. The current results extend previous work that sitting, even for a short period, may progressively contribute to changes in central and peripheral arterial stiffness and future cardiovascular event risk.

"My co-authors and I acknowledge that we have no conflict of interest of relevance to the submission of this abstract."

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## S103

### Lower-limb work during low- and high-impact tasks in hip-related pain: Associations with sex and symptoms

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**Background:** Hip-related pain (HRP) is a movement-related condition; however, previous biomechanics research into HRP have concentrated on male-dominated cohorts and focused on people undergoing surgical intervention. As a result, little is known about the biomechanical impairments of women with HRP and those not seeking surgery. Therefore, the aims of this study were threefold: (i) to evaluate the differences in lower-limb joint work between football players with and without HRP, (ii) to explore the relationship between lower-limb work and a person's burden of HRP, and (iii) to determine whether any potential differences/relationships were sex-dependent.

**Methods:** Football players aged 18-50 years were eligible to participate. For the HRP group, participants were eligible if they presented with a 6-month history of HRP; whereas control players were eligible if they presented with no lower-limb or lower-back pain/injury over the previous six months. A total of 88 players with HRP (23 women) and 30 asymptomatic controls (13 women) participated. Biomechanical data were collected during walking and single-leg drop jumps (SLDJ). HRP burden was quantified using the International Hip Outcome Tool (iHOT33). Between-group differences and relationships between lower-limb work done and a person's burden of HRP were assessed using linear regressions incorporating sex-based interactions.

**Results:** Walking: No joint work variables were different between

footballers with and without HRP independent of sex, nor were any relationships with a person's burden of HRP evident. SLDJ: A sex-specific interaction was present for the knee's relative contribution to total lower-limb negative work done, with women with HRP demonstrating a lower contribution compared to their asymptomatic female peers (37.7% vs 42.4%,  $P=0.04$ ). The iHOT33 was significantly associated with positive ( $P=0.03$  to  $<0.01$ ) and negative ( $P=0.02$  to  $<0.01$ ) work done by the hip as well as negative work done by the ankle ( $P=0.03$  to  $0.01$ ), independent of sex

**Discussion:** Overall, few differences were observed between players with and without HRP. Only one significant between-group difference was revealed, involving the knee in women only, providing further insight that the relationship between hip pain and biomechanics may be modified by sex. In addition, players with a greater self-reported burden of HRP tended to display lower hip joint work during the SLDJ. Rehabilitation programs for people with HRP should target these impairments and normalize lower-limb work done during high impact tasks.

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## S105

### Physical performance and fitness gain during an Infantry Commanders Course are influenced by chronic ankle instability

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**Introduction:** Army training often incurs physical injury, with ankle injuries occurring in 10-20 % of soldiers during training. These patterns are reported with similar frequency and body-part distribution of injury in Israeli Defence Force (IDF) combat units. Research has shown that 32 % of individuals with ankle injuries develop chronic ankle instability (CAI). This study aimed to determine whether having chronic ankle instability (CAI) affects the physical performance of soldiers during their army training, as measured in routine army fitness tests, and in other neuromuscular tests. It was hypothesised that soldiers with CAI would not perform as well on all lower limb performance tests, and would improve less during the period of military training.

**Methods:** A prospective cohort comparison was made within soldiers undertaking the Infantry Commanders Course (IC Course) of the IDF. Soldiers were tested at weeks one and 14 of the course, including with a 3,000m timed run, an agility test over an X-shaped course, the Y Balance Test (YBT) and the Active Movement Extent Discrimination Assessment (AMEDA) somatosensory test. All participants completed the required physical training throughout the course. Changes in physical performance were analysed using a two-way ANOVA, for soldier groups categorised as having healthy ankles or CAI based on a score of  $\leq 25$  on the Cumberland Ankle Instability Tool (CAIT) questionnaire.

**Results:** 105 soldiers (mean ( $\pm$ SD) height  $1.75\text{m} \pm 0.06$ , weight  $75.15\text{kg} \pm 10.74$ ) participated and were separated into those with and without CAI ( $n=59$  and  $46$ , respectively). Overall, scores on all 4 tests (3,000 m run, X-agility test, YBT and AMEDA) improved during the course. However, soldiers with CAI did not improve on the X-agility test, while those with healthy ankles did. At the start of the course, soldiers with CAI performed worse on the YBT-PM (postero-medial direction), but this difference was no longer present at 14 weeks. Compared with their