FSEM Spring Study Day 2016
Wednesday 20th April 2016
Clinical Exercise Medicine Up-dates

Book of Abstracts – afternoon session
Students Research Presentations

Parallel Session 1
Room HG20 – School of Nursing & Human Sciences Building

Parallel Session 2
Room X101 – Science Building
### SESSION 1

**Chair:** Ms Miriam Downey  
**Venue:** HG20, School of Nursing and Human Sciences

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<td>2.36pm</td>
<td>S1 - 2</td>
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<td>3.48pm</td>
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<td>Ms Emer O’Leary</td>
<td>The correlates associated with uptake to a community based chronic illness rehabilitation programme: MedEx Wellness</td>
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<td>Ms Emer O’Leary</td>
<td>The correlates associated with uptake to a community based chronic illness rehabilitation programme: MedEx Wellness</td>
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### SESSION 2

**Chair:** Mr Enda Whyte  
**Venue:** X101, Science Building

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<td>Mr Paul Miley</td>
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PARALLEL SESSION 1

ROOM HG20
School of Nursing
& Human Sciences Building
S1 - 2 - Achilles Tendon Rupture; Operative or Non-Operative Treatment for the Athlete - A Systematic Review

Eoghan Hurley1,2, Youichi Yasui MD1,3, John G. Kennedy MD, MCh, MMSc, FRCS (Orth)1

1Hospital for Special Surgery, New York, NY, USA, 2Royal College of Surgeons in Ireland, Dublin, Ireland, 3Teikyo University School of Medicine, Department of Orthopaedic Surgery, Tokyo, Japan

Background: Achilles tendon ruptures are a common injury and currently there is debate regarding whether the operative or non-operative treatment is best. Purpose: The aim of this study is to systematically review the current literature of meta-analyses on Achilles Tendon rupture repair, and to evaluate their results in terms re-rupture and return to sport. Methods: Two independent reviewers searched MEDLINE and EMBASE, on February 19, 2016 based on the PRISMA guidelines. The results were recorded and analysed for Numbers Needed to Treat (NNT) and statistical significance, for re-rupture and return to sports. Results: We identified nine meta-analyses, with patient numbers ranging between 448 and 898. Nine studies reported the re-rupture rate, which ranged from 3.1%-5% for the operative procedure, while it was 8.8%-13% for the non-operative approach. Four studies which reported the rate of return to sports, which ranged from 63.56%-71% for the operative procedure, while it was 53.88%-68.18% in all studies for the non-operative approach. The NNT for operative treatment was calculated, ranging from 10.1-19.3 for re-rupture, and 12.5-79.4 for rate of return to sports. Conclusion: All studies showed a significantly lower re-rupture rate with operative treatment, but none concluded they significantly improved rate of return to sports.

S1 - 3 - Assessing knowledge and attitudes towards concussion in Irish footballers

Connor Gallagher1, Eanna Falvey1

1University College Cork, Department of Medicine, Cork, Ireland

Background: The aim of the study is to assess the current knowledge of the symptoms, management, and potential complications of Traumatic Brain Injury (Concussion) amongst Irish footballers. Through focus on player understanding and attitude, interventions can be designed to target and raise awareness to improve future clinical outcomes. Results will be compared with other team sports as well as international standards. Methods: 70 players from the current UCD soccer League of Ireland and Leinster Senior league squads completed a standardised and validated (RoCKAS) questionnaire assessing their current knowledge as well as attitude towards concussion. The results allow direct comparison with a previous study looking at Professional English soccer players in England in 2014, as well as contrast to other questionnaires among amateur rugby union players in Ireland. Results: We found raised levels of Knowledge understanding of Concussion compared with previous studies looking at soccer players. Findings would also suggest football players are less inclined to continue an important game after sustaining a concussion compared to their rugby counterparts.
S1 - 4 - Conservative management of glenoid labrum tear in hips with CAM morphology: a review of the literature and case report in a 19 year old professional footballer

Mark Kenneally¹, Eanna Falvey¹,²

¹University College Cork, Department of Medicine, Cork, Ireland, ²Sports Surgery Clinic, Santry, Dublin, Ireland

Background: The presence of Glenoid Labrum tears in hips with CAM morphology provides a challenge to sports medicine practitioners. It is suggested that this condition may cause early hip osteoarthritis, and over the last decade surgical intervention has become popular. It is proposed that surgery corrects the abnormal contact associated with this condition and reduces the risk of development of osteoarthritis. There are to date, however, no longitudinal studies showing this to be the case, and there is a growing body of evidence showing the presence of such deformities in asymptomatic populations, even within elite sport. Aims: This study reviews the literature around the management of femoroacetabular impingement, and presents the conservative management of a 19 year old professional footballer with the condition over a 12 month period. Methods: A literature review was carried out of all the major databases with the keywords conservative, management, femoroacetabular impingement, CAM. The case report outlines a management protocol including activity modification, symptom monitoring using HAGOS, load management using ROM and neuromuscular strength as monitored outcomes, biomechanical assessment and regular radiological examination. Discussion: The literature review further emphasises the need for high quality studies in this area, and the case report documents, over a 12 month period, the successful management of such a case.

S1 - 5 - A prospective observational study on injury and illness of collegiate and club male rowers during a winter training phase

Shakespeare I¹, Fallon A¹, Kearney R¹, Claffey M¹, Mahony N¹

¹Human Performance Laboratory, Anatomy Dept., Watts Building, Trinity College Dublin, Ireland

Background: Rowing is a non-contact endurance sport and at non-elite levels, where most train and compete, little data exists on injury and illness rates. The aim of this study was to profile injury and illness rates in non-elite rowers. Methods: Senior male rowers (n=24); collegiate (n=13; age=20.6±1.2yr; height=190.5±4.8 cm; Body mass=83.7±5.0 kg; Body fat 12.5±2.7 %) and club (n=11; age=27 ±4.0yr; height 186±4.0cm; Body mass=83.4±6.5 kg; Body fat 14.6±3.0%) were recruited. Winter training phase injury and illness data were collected in monthly questionnaires and medical interview/examination at baseline, 3 and 6 months. Exposure data were recorded in weekly training logs. Results: Preliminary four-month results show an injury incidence for all participants of 4.01/1000hr; and, 2.97 and 5.26/1000hr training in collegiate and club, respectively. The total time loss for all was 76 days (collegiate 43d, club 33d). Most training time loss (66 days) was due to illness; mainly ENT and respiratory illness with one significant incident. Less time was lost (10 days) due to injury, mainly overuse types at typical sites lower back, rib, and forearm/wrist. Discussion: Injury incidence is low in non-elite rowers. Illness was mainly respiratory and injury was mainly overuse at typically reported sites.
S1 - 6 - An assessment of the uptake of a validated injury prevention programme when introduced in ladies football and camogie, participation rates and player satisfaction

O'Brien A¹, Burke C¹, Falvey E¹

¹University College Cork, Department of Medicine, Cork, Ireland

As more ladies are now playing field based sports the number of documented knee injuries have increased exponentially. The incidences of Anterior Cruciate Ligament (ACL) have been one of the most documented injury and incidence rates amongst females are 4-6 times higher than that of their male counterparts. A number of studies have shown that an eight week structured neuromuscular control training programme may significantly reduce lower limb injuries in female athletes. This study introduced the santa monica injury prevention program over an 8 week period across club and county level female athletes aged between 13-40years old. A total of 149 athletes were videoed using 2D video analysis. 23 athletes were placed in a control group and completed a traditional warm up program and 126 completed the neuromuscular program. 3 jumps were analysed prior to commencing the program at 8weeks post. 2 lower limb injuries were reported in the control group and 1 lower limb injury in the prevention group. Statistical analysis is not available until the 8/4/2016.

S1 - 7 - A study to evaluate the effects of a neuromuscular injury prevention programme (GAA 15) in adolescent males participating in hurling

Kelly, S¹, Lodge, C¹

¹Institute of Technology Carlow

Introduction: Post primary school adolescent involvement in organised sport has increased popularity in Ireland, however, these increased levels of activity have caused concern regarding the potential risk of sporting injuries. Previous research into adolescent injury incidence in a variety of multidirectional field sports, have established a decline in injury rates following the implementation of injury prevention programmes. Method: To date 518 male subjects (aged 16.75 ± 0.56 years) have been recruited from fourteen post primary schools. The intervention group (7 schools) implemented an injury prevention programme namely the GAA 15 before training and matches. The control group (7 schools) adopted their normal warm-up behaviour prior to matches and training. Before commencement, each player underwent a screening process to assess baseline records of neuromuscular function and physical performance measures. Results: Preliminary results are expected in May 2016. It is hypothesised that the implementation of a neuromuscular injury prevention programme (GAA 15) can; 1. Reduce non-contact sporting injuries in adolescent males participating in hurling. 2. Improve baseline performance measures. Discussion: It is envisaged the findings of this research will, for the first time help establish the GAA 15 as a superior neuromuscular injury prevention warm-up compared to standard adolescent warm-up protocols.
S1 - 8 - The effects of supervised weight training on strength and power in senior male rowers

Horgan A, Hamilton R, Fleming N, Mahony N

Human Performance Laboratory, Anatomy Dept, Watts Building, Trinity College Dublin, Ireland

Background: Rowing is predominantly aerobic, however, strength and power are essential for 2000m races. As resistance training is often neglected in this cohort this study investigated the effects of supervised weight training on strength and power in senior male rowers. Methods: Senior male rowers (n=21); Collegiate n=12; (M±SD); age= 20.9±1.1 years; height= 1.9±0.1; weight= 81.9±5.6kg; body fat= 12.9±2.8% and; Club n=9; age= 26.4±2.7 years, height= 1.87±0.5m; weight= 86.9±7.4kg; body fat= 15.9±2% underwent strength tests of; vertical jump (VJ) one repetition maximum (1RM) squat (SQ), and a six stroke rowing maximum power test (RPT). Rowers then performed a six week resistance training programme twice weekly. Collegiate rowers were supervised by a strength and conditioning coach (supervised) and club rowers were unsupervised (control). All participants were then retested using the same outcome measures. Results: Mean (±SEM) percentage changes from baseline were 6%, 5.7% and 19% in the supervised group and -2.2%, 0.2% and 12.2% in the control group for the VJ, RPT and SQ respectively. Conclusion: It is clear from preliminary analysis that the supervised group showed superior improvements to the control group. This study highlights the importance of group training, coaching and education of the endurance athlete in weight training sessions.

S1 - 9 - The effect of an 8 week Pilates intervention in club level Gaelic games players

Coakley S, Donne B, Mahony N

Human Performance Laboratory, Anatomy Dept, Watts Building, Trinity College Dublin, Ireland

Introduction: 76% of all injuries are lower limb injuries in GAA (Murphy et al. 2012). Improved balance and proprioception has been shown to decrease injury rate and incidence of ankle sprains and knee ligament injury (Barengo et al. 2014). Joseph Pilates, invented a mind body exercise system (circa 1912) which helps to develop strength, flexibility, balance and proprioception aiming to improve functional movement and prevent injuries. Previous studies on Pilates interventions in non-athletic populations have shown improvements in balance and flexibility (Segal et al. 2004) however, there are very few studies in athletic populations (Chinnavan et al. 2015) and no data on Pilates interventions in Gaelic games. The aim of this study is to investigate the effects of an eight week Pilates intervention, on strength, flexibility and proprioceptive measures in GAA players. Methods: 21 participants recruited from a local Dublin GAA club will undertake Pilates training for one hour twice a week for 8 weeks. The following outcome measures will be assessed pre and post Pilates training and in a prior repeatability and reliability study: sit and reach test, flamingo balance test, hip range of motion, single leg hop, Y balance test, vertical jump and active knee extension test.
S1 - 10 - Effect of stride rate manipulation on lower limb kinematics during barefoot and shod running

Mullins M J1, Fleming N1, Mahony N1, Donne B1

1Human Performance Lab, Anatomy Department, Watts’ Building, Trinity College Dublin, Ireland

Background: Running is one of the most easily accessible recreational sports; however, it is also associated with a high risk of overuse injury. Research suggests that barefoot running may alter running mechanics and reduce the overall injury risk. However, these alterations in running mechanics may simply be due to higher stride rates. This study aims to test this hypothesis, by comparing metabolic cost, muscle activity and lower limb joint kinematics at fixed stride rates during both shod and barefoot running. Methods: The proposed study is an observational crossover design, investigating a series of 5 stride rates (normal, +5, +10, -5, -10 strides.min⁻¹) across two conditions (barefoot and shod) at a fixed submaximal velocity (75% of VO2max). 15 recreational runners will attend the laboratory on two occasions. The initial visit will comprise of a maximal graded incremental test. During the second visit, metabolic cost, joint kinematics and EMG from 4 lower limb muscles will be recorded. Trials will consist of 2 (condition) x 5 (stride rate) x 4-min treadmill running bouts. EMG, metabolic and kinematic data recorded in the final 30-s of each trial will be subsequently analysed using repeated measures ANOVA with appropriate post-hoc tests to quantify significant differences.

S1 - 11 - The effects of an 8-week exercise intervention with post-operative scoliosis adolescents on upper and lower limb strength, endurance and balance

Rafferty T1, Donne B1, Kiely P2, Quinn A2

1Human Performance Lab, Anatomy Department, Watts’ Building, Trinity College Dublin, Ireland, 2Our Lady’s Children Hospital Crumlin, Dublin, Ireland

Background: Previous research investigating adolescent scoliosis (AS) has focused on treatment protocols, post-operative return to function, spinal and lower limb ROM, pain and surgical approaches. However, negligible research exists investigating the effects of musculoskeletal strength and conditioning in post-operative AS. Aims: Firstly, to determine if scoliotic adolescent who have undergone spinal correction (12 month post-operative) have deficiencies in strength, endurance and balance when compared to an aged match sample of the general population. Secondly, to determine if an 8-week structured exercise program can negate these detected deficiencies. Methods: Randomised paired control trial involving 3 discrete groups. Intervention group (n= 20, post-operative AS); control group, Con A (n=20, non-scoliotic controls matched for gender, age and anthropometrics) and scoliotic control group, Con B (n=20, control post-operative AS). Initially all participants will undergo standardised tests to establish baseline strength, endurance and balance. Tests will be repeated after four weeks to quantify reproducibility and reliability. Subsequently, the intervention group will undertake a monitored exercise, strength and conditioning program for eight weeks. Finally, all participants will be re-tested (standardised tests) to identify if significant changes have occurred across time in strength, endurance and balance comparing intervention and non-scoliotic and scoliotic control groups.
S1 - 12 - Perceptions and levels of physical activity and physical fitness of Macra na Feirme members (rural youth in Ireland)

Murphy M, Falvey E

Department of Medicine, University College Cork, Cork, Ireland, Department of Sports Medicine, Sports Surgery Clinic, Dublin, Ireland, Irish Rugby Football Union, Dublin, Ireland

Background: Physical activity and fitness are topics frequently discussed at present. The benefits are numerous while physical inactivity on the other hand, has been found to have a negative impact on health (Blair 2009). Macra na Feirme is a rural youth organisation for people between the ages of 17 and 35 and to date there has been no research done onto this population and their levels of physical activity or physical fitness. Methods: This study was in two parts. There was a questionnaire based element consisting of the International Physical Activity Questionnaire (IPAQ) and another page which contained open ended questions in order to gather information on participants’ perceptions of physical activity and their own physical fitness. The second part was a fitness test using the 2.4km Cooper Run. At the end of the physical activity questionnaire participants were be asked if they would like to participate in a physical fitness test at a later stage. All participants that consented were contacted and asked to participate in a physical fitness test. Those that scored poorly were given a physical activity plan and advice and retested in February 2016. Findings: 478 questionnaires from Macra members were analysed. Macra members demonstrated moderate levels of physical activity according to the IPAQ analysis. Members were broadly aware of the benefits of physical activity but not of the specific benefits or the type of exercise that they should be engaging in. The key barriers described were free-time, suitable facilities, inclement weather and personal reasons; including motivation and previous injury. 21 Macra members took part in the fitness tests and only 4 of these had a VO2 max when calculated that was below average. Conclusions: Macra members have moderate levels of physical activity and fitness and while aware of the benefits of physical activity do not prioritise it in their daily lives very frequently. This may be due to lack of knowledge about how beneficial it can be. There needs to be an increased focus on educating Macra members on the benefits of physical activity and making time for it in their busy lives.

S1 - 13 - Participant experience of TickerFit mobile phone application as a remote activity monitoring system in a cardiac rehabilitation population

Cradock K, Faulkner B, Mageean C, Aston A, Cunningham C

Heart 2 Heart Cardiac Physiotherapy, Dublin, Ireland, School of Public Health, Physiotherapy and Sports Science, University College Dublin, Ireland

Adherence with cardiac rehabilitation (CR) programmes presents challenges. Remote physical activity (PA) monitoring using mobile phone technology offers a potential solution. TickerFit is a mobile app which allows concurrent self and health professional PA monitoring. This study will explore the TickerFit user experience. Methods: A focus group with three UCD Better Hearts, CR programme participants (2 M, 1F; mean age 59), who used TickerFit over six weeks was audio recorded and data transcribed, coded and analysed for themes by two independent researchers. Results: Three themes were identified; physiotherapist monitoring; use as a motivational tool and usability. Benefits identified included ‘feeling more secure as a result of physiotherapist monitoring’ and ‘the ability to self monitor PA progress with a simple app being motivating’. Downloading and navigating the app presented some initial challenges. Conclusion: This study demonstrated the utility of TickerFit as a useful adjunct for CR. More extensive user orientation may improve interaction with the app. Further trials with larger representative CR samples, which include a control are required to further evaluate such applications in terms of user experience and improving exercise adherence.
S1 - 14 - The correlates associated with uptake to a community based chronic illness rehabilitation programme: MedEx Wellness

O’Leary E,1,2 McCaffrey N,1 Doyle F,3 Furlong B,1 Walsh D,1 Woods C1

1MedEx Research Cluster, School of Health and Human Performance, Dublin City University, Ireland, 2DCU Sport, Dublin City University, Ireland, 3Division of Population Health Sciences, Royal College of Surgeons in Ireland, Ireland

Background: Physical activity is a principal intervention in primary and secondary prevention of chronic illness. MedEx, a community based chronic illness rehabilitation programme uses structured exercise as its main modality. The aim of this study is to identify the correlates of uptake to MedEx. Methods: Participants referred to MedEx via GPs and hospitals completed a baseline questionnaire (physical activity screening, self-efficacy for exercise, intentions for exercise, and social support for exercise from family, and from friends). Health related fitness was assessed by the ISWT, a lower body strength test and BMI. Uptake was monitored a 12month time period. Results: 249 males (56%) and 192 females (44%) with the mean age of 64.26 (±12.03) completed baseline measures. Of the 441 individuals that took part in baseline measures 340 (77%) became Uptakers, with a greater uptake in females (82%) compared to males (73%). Bivariate analysis found that Uptakers live closer to the facility, have a lower BMI, greater intentions for exercise and receive greater support for exercise from their families. Discussion: These results highlight a high uptake to MedEx and also identifies the areas of social support and intentions as possible areas to intervene to improve uptake.

S1 - 15 - Validity, Reliability and Repeatability of the 10 Repetition Sit-to-Stand Test in a Chronic Illness Population

Mc Laughlin J,1 Furlong B,1 McCaffrey N1

1MedEx Research Cluster, School of Health and Human Performance, Dublin City University, Ireland

Background: The sit-to-stand test (STS) is a widely used field-based measure of leg strength, which can be administered using different protocols. The 5 repetition STS and 30 second STS are valid and reliable. A 10 repetition STS may increase sensitivity compared to the 5STS but decrease physical demand compared to the 30sSTS. Aim: To determine the validity, reliability, and repeatability of the 10STS. Methods: 16 participants (5M, 11F) were recruited from a community-based chronic illness rehabilitation programme. Leg strength was assessed using a hand-held dynamometer. Two trials of each of the 10STS, 5STS, and 30sSTS were performed on separate visits, the order of which was randomized. The 10STS was repeated on an additional visit. Results: Excellent correlation was found between the 10STS and the indicators of leg strength measured by dynamometry (knee flexion and extension) (r=-0.95 to -0.98, p < 0.01). The 30sSTS (r=0.55 to 0.71, p <0.05) and 5STS (r=-0.73 to -0.89, p <0.01) were significantly correlated with leg strength. The test-retest reliability of the 10STS was excellent (ICC=0.99). Conclusions: The 10STS is a valid, reliable and repeatable measure of leg strength in a chronic illness population.
S2 - 1 - Improving the Heel Strike of Fast Bowlers to Prevent Ankle Sprains / Injuries in Cricket

Dookhantie, M

School of Medicine, Royal College of Surgeons in Ireland, Dublin, Ireland

Being a Fast Bowler myself, along with observing the bowling techniques of others, there is a problem with the heel strike upon delivery of a cricket ball. It is the moment when all your momentum built up running is transferred to the arm when releasing the ball via the front leg which acts as a pivot. The impact upon landing especially when the player has a large bound is huge and this would be one of the reasons why ankle sprains are one of the commonest acute injuries in cricket. [1] It is seen that people don’t practice proper landing in sport [2] and it is an area that needs to be researched especially when there is pronounced dorsiflexion[3] of the foot as in fast bowlers in cricket that have poor landing techniques. It can be noted as well that the focus should be on the anterior talofibular ligament which is commonly injured.[4] Specially designed shoes or a standardized bowling landing technique can be the outcome of this research to make coaches/players/medical staff more aware to increase player performance, decrease the incidents of injury and contribute to an overall better team performance.

S2 - 2 - The Effects of the GAA15 on Lower Extremity Injury Incidence and Neuromuscular Functional Outcomes in Collegiate Gaelic Games

Schlingermann B, Lodge C, Rankin P

Institute of Technology Carlow, Carlow, Ireland

Background: Research into the epidemiology of injury in Gaelic games revealed that injuries are primarily noncontact in nature and approximately three quarters of the injuries occur in the lower extremity. Previous research suggests that the implementation of structured neuromuscular training programmes can significantly reduce the incidence of injury in field sports. Therefore, the aim of this study will be to implement a structured neuromuscular training programme (dynamic GAA15) in collegiate Gaelic games and determine its effects on the incidence of injury. Methods: 154 participants were recruited from the Gaelic games teams from the Institute of Technology Carlow. All players involved participated in preseason and postseason testing which involved performance of the Y Balance test. A dynamic GAA15 warm up was created for this cohort and coaches were instructed to implement the programme before every training session and match throughout the collegiate GAA season. Player’s injuries were documented on a weekly basis throughout the season using an online database system. Results: Significant improvements in Y balance performance (Right composite: p= 0.000 CI= 1.90;3.98/ Left composite p= 0.000 CI= 1.60;3.34) were determined as a result of the implementation of the GAA15 and 42 injuries were documented. The reported injury rates were 1.24 per 1000hours training and 2.91 per 1000hours match play. Injury proportion was 0.12. Conclusion: Implementation of a structured warm up programme such as the GAA15 reduced the risk of injury in Gaelic games and improved player’s neuromuscular performance.
S2 - 3 - The use of directional-bias screening to predict injury risk and injury side; A study of Elite Irish Women’s Sevens Players

Parkes S\textsuperscript{1}

\textsuperscript{1School of Physiotherapy, University College Dublin, Ireland}

Background: Research evidence is minimal on the effectiveness of directional bias screening to; A) Highlight ‘over-use’ injury risk & determine grade of risk (Grade 0-2), B) Predict overuse injury side. Aims: 1. Compare incidence of overuse injury to a graded bias (Is graded side bias predictive of injury and/or non-injury?) 2. Compare injury side to bias side (Is bias side predictive of injury side?) Secondary: 3. Does injury recurrence increase if there is a grade 2 bias? 4. Is there a correlation between bias, seasonal loading and overuse injury? Methods: Players were screened and categorised as grade 0-2 left or right bias. Prospective injury and loading data over one year period is currently being monitored via Kitman Labs Technology and will be followed until August 2016 (ongoing). Implications: This study could contribute to a greater understanding of movement screening and help to predict potential risk factors and allow for more specific management and injury protection. Hypothesis: Grade 2 side bias is a predictive marker for overuse injury risk and injury side. Grade 0-1 bias is predictive of non-risk of overuse injury.

S2 - 4 - A study to investigate the epidemiology and modifiable risk factors for injury in adolescent Gaelic football

Miley P\textsuperscript{1}, Lodge C\textsuperscript{1}

\textsuperscript{1Department of Science and Health, Institute of Technology Carlow, Carlow, Ireland}

Introduction: Recent research suggests that 32% of adolescent Gaelic football players will suffer an injury in a given year. 64% of these injuries were non-contact in nature and may be preventable. The objective of the present study is to establish the potential risk factors for injury within the GAA, identifying potential strategies to decrease injury incidence. Method: 498 male Gaelic football players (mean age: 15.4 ± 1.3 years) were recruited from second level schools across Leinster. Subjects completed a daily questionnaire online regarding their training loads, sleep quantity, hydration and self-reported injuries. Subjects were tested for measures of strength, power and balance at the beginning and end of the trial. Semi-structured interviews will be carried out with one coach and one player from each team towards the end of the study. Results: Preliminary results are expected in May 2016. Discussion: This study will contribute to a growing body of literature regarding injuries and injury prevention among adolescent athletes. It is the first study of its kind to be carried out in Ireland and also the first study executed with the intent of establishing the influence of individual risk factors or groups of risk factors on injury incidence in this cohort.
S2 - 5 - The Effect of High Intensity Intermittent Exercise Protocol on Female Drop Jump Performance

Cooney H1, Russell A1, Whyte E1
1School of Health and Human Performance, Dublin City University, Ireland

Background: There is a high incidence of Anterior Cruciate Ligament injury in game play (Hootman 2007), particularly in female athletes (Hewett 2005). The majority of current research focuses on discussing the biomechanical risk factors of ACL injury (Cortes 2012). Recently studies now suggest that fatigue may be a risk factor in ACL injury. However there is a lack of research investigating the effect of fatigue on the biomechanical factors that are related to ACL injury. Aim: Investigate the effect of high intensity intermittent exercise (HII) on the landing kinetics and kinematics of female drop jump performance. Methods: Participants were recruited from Soccer, Field hockey, Gaelic football, Camogie and Basketball. A 6-camera 3D motion analysis system synchronized with two force platforms was used to collect kinematic and kinetic data. Results: 15 varsity female athletes voluntarily participated in the study. Post HIIP drop jump performance decreased and biomechanical variable associated with an increased risk of ACL injury were augmented. Conclusion: Training landing mechanics while athletes are in a fatigued state may decrease the incidence of ACL injury. These results have important implications for the future design and timing of ACL prevention and rehabilitation programs.

S2 - 6 - To determine the relationship, if any, between rotational hip angle and vastus medialis oblique muscle activation

Delahunt G1, Donne B1, Fleming N1, Mahony N1
1Human Performance Laboratory, Anatomy Dept., Watts Building, Trinity College Dublin, Ireland

Background: Vastus medialis (VM), originates from the intertrochanteric line, linea aspera, medial supracondylar line, adductor tendons and the medial intermuscular septum. Distally VM fibres insert into the patella obliquely, as vastus medialis obliquus (VMO). VMO is said to control patellar alignment during knee movement, and some studies report lower VM:VL (vastus lateralis) ratios to be positively correlated with incidence of patellofemoral pain. Currently there is no universally accepted opinion on optimal hip rotation angle for VMO activation in rehabilitation. This study aims to investigate the effects of altered hip rotational angle on VM/VL electromyography (EMG) activity. Methods: 25 healthy 18-45 year-old males will be recruited from a non-elite sporting population. All participants will be right leg dominant with no history of serious knee pathology. Participants will undergo isometric knee extension exercise on an isokinetic dynamometer with continuous recording of VL/VM EMG. Knee extension force will be set at 70% of maximum and EMG data will be recorded at knee angles of 90 and 30° with corresponding hip rotation of 0 (neutral), 10 and 20° of internal rotation and 10° of external rotation. Data will be analysed to ascertain optimum position, if any, for VMO activation, in a rehabilitation context.
S2 - 7 – Withdrawn

S2 - 8 - Change in performance markers in senior male rowers through Winter Preparation Phase Training

Fallon A1, Shakespeare I1, Mahony N1, Fleming N1, Donne B1

1Human Performance Laboratory, Anatomy Dept., Watts Building, Trinity College Dublin, Ireland

Background: Rowing performance markers are assessed to monitor training and for crew selection. This study investigated change in performance markers derived from laboratory based graded incremental tests (GXT) and ergometer time trials in non-elite rowers in winter training. Methods: Senior male rowers (n=25); M±SD age=23.2±4.2yr; height=1.9±0.1m; body mass=83.1±5.5kg; body fat=13.5±3.0% performed GXTs in early winter training to establish load at lactate threshold (Load@T_Lac) and maximum load (Load_Max). Coaches were also advised to conduct baseline 5km rate-capped ergometer time trial (TT). All rowers were given individualised training plans based on baseline testing for three months and then underwent repeat testing. Results: Pre and post GXT and TT were completed by 25 and 11 rowers, respectively. M±SD Load@T_Lac and Load_Max were 267.7±23.9W and 373.8±26.1W in GXT1, and 287.5±24.0W and 378.9±23.4W in GXT2; and, times for TT1 and TT2 were 1229.7s and 1230.8s, respectively. Load@T_Lac improved significantly by 20W (P<0.05; Cohen’s d=0.99) but there was no change in GXT Load_Max or 5km ergometer time trial performance (P>0.05). Discussion: Early winter training emphasising low-intensity aerobic endurance, resulted, as expected, in improvements in performance at T_Lac where training intensity was targeted. Further testing (GXT3 and TT3) will examine effects of later stage winter phase training.

S2 - 9 - Profiles of aerobic training heart rate zones in senior male rowers

Kearney R1, Claffey M1, Fleming N1, Mahony N1, Donne B1

1Human Performance Lab., Anatomy Department, Watts Building, Trinity College Dublin, Ireland

Background: The use of heart rate zones (HRZ) to add quality to training is now common practice in endurance athletes in winter preparation phase. HRZ may be determined from empirical formula or directly interpolated from HR lactate relationships in laboratory based fitness tests. The aim of this study was to profile typical HRZ derived from laboratory based exercise testing in non-elite rowers throughout a winter training phase. Methods: 24 senior male rowers performed two incremental ergometer tests to volitional exhaustion in early (GXT1) and middle (GXT2) winter training phase. Blood lactate (BLa) HR responses were plotted graphically and individual aerobic HRZ interpolated at BLa <1mM (A1); 1-1.5mM (A2) and 2-3mM (A3) for the purposes of easy active recovery, aerobic conditioning, and lactate threshold training respectively. Results: To date Mean (±SD) HRZ A1 to A3 were <132±9; 135±9 to 150±10 and 155±8 to 165±8 for GXT1; and, <139±8; 144±7 to 156±7 and 161±7 to 170±7 for GXT2. There was no statistical difference in aerobic HRZ A1 between GXT1 and GXT2 (Student’s t test; P<0.05). However, there was a statistical difference in aerobic HRZ A2 and A3 between GXT1 and GXT2 (Student’s t test; P<0.05). Discussion: Aerobic metabolism supplies 75–80% of the energy demands for a 2000-metre rowing race. Training should therefore emphasise aerobic intensities. HR monitoring is a preferred measure of exercise intensity in such sports (Achten et al. 2003). Participant’s HRZ A2 and A3 differed significantly at GXT1 and GXT2 suggesting the need for serial HRZ training prescriptions throughout a season.
S2 - 10 - Change in submaximal physiological markers in senior male rowers through early winter preparation phase training

Claffey M1, Kearney R1, Mahony N1, Fleming N1, Donne B1

1Human Performance Lab, Anatomy Dept., Watts Building, Trinity College Dublin, Ireland

Background: Physiological performance data derived from laboratory-based graded incremental tests (GXT) are used to monitor training. This study investigated change in three parameters at two sub-maximal workloads in non-elite rowers in early winter training.

Methods: Senior male rowers (n=25); M±SD age=23.2±4.2yr; height=1.9±0.1m; body mass=83.1±5.5kg; body fat=13.5±3.0% performed GXT in early winter training to establish physiological responses of oxygen uptake (VO2), heart rate (HR) and blood lactate (BLa) at two sub-maximal loads, 160 and 240W on a CII rowing ergometer. Rowers undertook individualised training plans based on baseline testing for three months and then underwent repeat testing. Results: M±SEM data at 160W were; [VO2] 37.0± 1.0 and 36.3±0.9mL.kg⁻¹.min⁻¹; [HR] 142±4 and 136±4 beats.min⁻¹ and [BLa] 1.1±0.1 and 0.7±0.1mM, for GXT1 and GXT2 respectively. M±SEM data at 240W were; [VO2] 48.8±0.8 and 48.9±1.2mL.kg⁻¹.min⁻¹; [HR] 165±3 and 164±3 beats.min⁻¹; and, [BLa] 2.9±0.3 and 1.9±0.3mM, for GXT1 and GXT2 respectively. BLa data showed highly significant reductions (P<0.01; effect size =0.97) across time at both workloads, however there was no significant change in VO2 or HR.

Discussion: Early winter training emphasising aerobic endurance, resulted in improvements in BLa profile where training intensity was targeted. Further testing (GXT3) will examine effects of later stage winter phase training.

S2 - 11 - An audit of pre-participation medical evaluation of athletes attending for laboratory based exercise testing and training prescription

Boyce M1, Mahony N1, Donne B1

1Human Performance Laboratory, Anatomy Dept., Watts Building, Trinity College Dublin, Ireland

Background: Pre-participation medical evaluation (PPE) is not routine practice in endurance sports. However, endurance athletes attending for sports specific fitness assessment and training prescription in our laboratory undergo routine PPE. This study aimed to audit exclusions, restrictions and recommendations arising from PPE in an exercise laboratory setting.

Methods: Physician led PPE included an eight-section health questionnaire review, targeted physical examination, and ancillary investigations (FBC/Spirometry). PPE data from 1/7/14 to 1/7/15 were anonymised and audited. Results: 254 athletes (67 female/187 male) attended for testing. Sports were; cycling (n=85;~33%), triathlon (n=70;~28%) running (n=38;~15%) rowing (n=12;~5%) and others (n=49;~19%). Number of exclusions, restrictions and further recommendations are currently being reviewed by the lead physician (MB). However, initial scrutiny suggests exclusions were usually temporary (inter-current illness); however, two cases potentially serious conditions were discovered (aortic sclerosis, heart murmur). Restriction to sub-maximal tests were mainly due to age, PMHx, and CHD risk factors; and main recommendations were; GP self-referral for BP check, asthma review or review of medications. Conclusion: PPE audit revealed an ~1:125 rate of serious medical conditions; restrictions were mainly due to modifyable health risk factors, and recommendations were mainly made to ensure ongoing review of chronic conditions that could affect performance.
S2 - 12 - Optimising the Referral Process to Community-based Exercise Rehabilitation Programmes for Cancer Survivors: A Delphi Study

Cooney M1, McCaffrey N1, Furlong B1, Walsh D1,2, Smyth S3, Boran L3, Woods C1

1MedEx Research Cluster, School of Health and Human Performance, Dublin City University, Ireland, 2Insight Centre for Data Analytics, Dublin City University, Ireland, 3School of Nursing, Dublin City University, Ireland

Purpose: Health care professionals (HCPs) are encouraged to consider physical activity (PA) promotion as part of usual care for all cancer patients1. It’s suggested that medical professionals refer patients to external sources for more comprehensive community-based support2. This Delphi study aimed to identify barriers and motivators experienced by HCPs when referring cancer patients to community-based exercise programmes (CBEPs), and strategies to optimise the referral process. Methods: 114 HCPs were invited to complete the round one (R1) online questionnaire. HCPs were asked open-ended questions regarding the motivators and barriers to referral to CBEPs, and strategies to optimise this process. In round two (R2), respondents were asked to rate their level of agreement or disagreemt with statements arising from R1. The aim of R2 was to achieve consensus regarding the optimisation of the referral process. Results: A score of 70% (across strongly agree/agree or strongly disagree/disagree categories) was established as a consensus threshold. 4/6 motivator statements, 3/13 barrier statements and 12/15 strategy statements achieved consensus. The key barriers identified included a lack of programmes to refer to and poor access to existing programmes. Optimisation strategies included electronic referral and education for staff regarding PA promotion for cancer survivors and information about CBEPs.

S2 - 13 - An Evaluation of the effect of the MedEx programme on physical, clinical and psychosocial outcomes

Skelly F1,2, O’Leary E1,2, Furlong B1,2, Loughney L1,2, Woods C1,2, McCaffrey N1,2

1MedEx Research Cluster, School of Health and Human Performance, Dublin City University, Ireland, 2DCU Sport, Dublin City University, Ireland

Background: The aim of this study was to evaluate the effects of MedEx (a community based chronic illness rehabilitation programme) on aerobic exercise capacity. Methods: We prospectively studied 91 participants with a chronic disease (heart, lung, diabetes, cancer) who undertook a 6 Minute Time Trial (6MTT) at baseline (prior to beginning the MedEx programme) and at 3 months (following joining the programme). Paired sample t-tests were used to compare results between baseline and at month 3. Results: Of the 91 participants assessed, mean age was 66 (+ 9.34) and 55% were are male. There was a statistical significant improvement in 6MTT between baseline and month 3 distances ((434.73 + 106.029 vs. 494.38 + 101.659; p=0.00)), data presented as mean (SD). Discussion: Participation in MedEx, a community based chronic rehabilitation programme, resulted in a significant improvement in aerobic capacity. This study is ongoing and will continue to assess participants at month 6 and 12 following joining MedEx to assess the long-term effect of participating in such a programme.
S2 - 14 - The Prevalence of Pain in Adults with Established Chronic Illness

O'Hanrahan N1, Dineen M1, Callaghan D1, Furlong B1, McCaffrey N1
1MedEx Research Cluster, School of Health and Human Performance, Dublin City University, Ireland

Background: Exercise rehabilitation is strongly associated with secondary prevention of several chronic conditions. However, musculoskeletal limitations can often be the factor that limits participation in exercise rather than the illness itself. Aim: To determine the incidence of pain among participants of MedEx, a community-based exercise rehabilitation programme for chronic illness. Methods: 68 MedEx participants (45 from the cardiac rehab class and 23 from the pulmonary rehab class) completed the Short Form McGill Pain Questionnaire. The questionnaire consists of 15 descriptors of pain (11 sensory and 4 affective), a present pain intensity index, and a visual analogue scale. A body chart was also used to identify pain location. Results: 63.2% of all participants reported pain. 51% of the cardiac rehab class and 87% of the pulmonary rehab class reported pain. The most common locations of pain among all participants was the back (20.5%), knee (19.1%) and hip (16.2%). In the cardiac rehab class and pulmonary rehab class the most common location of pain was the back (20%) and knee (30.4%), respectively. Conclusion: Almost two thirds of MedEx participants reported pain. There was a higher prevalence of pain in pulmonary rehab participants compared with cardiac rehab participants.

S2 - 15 - Use of Inertial Sensors to Aid with the Development of an Automated Musculoskeletal Injury Risk Screening Tool

Whelan D1,2, O'Reilly M1,2, Delahunt E2, Caulfield B1,2
1Insight Centre for Data Analytics, University College Dublin, Ireland, 2School of Public Health, Physiotherapy and Sports Science, University College Dublin, Ireland

Background: Musculoskeletal screening is used to identify modifiable injury risk factors. The analysis of aberrant movement during screening tests is dependent upon rater experience, and thus is subjective in nature. Recent developments in Inertial Measurement Units (IMUs) offer the potential for the automatization of screening tests with the provision of valid and reliable quantification of performance. Methods: Eighty-three participants (24.68+/-4.91 years, 1.75+/-0.09m, 76.01+/-13.29kg) were fitted with IMUs on their lumbar spine, shanks and thighs and completed a range of common screening tests. Repetitions were recorded and labelled by a Chartered Physiotherapist. Features were extracted from the labelled sensor data and used to train and evaluate a classifier that will form the basis of an automated injury-screening tool. Results: The classifier was able to distinguish between good and bad squat and single leg performance with 84% and 93% overall accuracy respectively. Data analysis is currently ongoing to detect deviations in the lunge, deadlift and tuck-jump. Discussion: These results indicate that body-worn IMUs can effectively analyse squat and SLS technique. Further analysis will allow for the development of a more robust classification system for these and other movements. Furthermore, the system may be useful for exercise biofeedback for conditioning and rehabilitation purposes.