

**Workshop:
'Movement Quality for Injury Prevention and Performance in Youth Football'
Hosted by Southampton Football Club at St Mary's Stadium
Tuesday 10th October 2017**

Summary

This interactive workshop involved 35 people, including football coaches, players, and national and international researchers. Brief presentations (10-15 minutes) set the scene for longer (30 minutes) discussion sessions. This summary of the day's events highlights the key messages that are now informing the next steps in our football injury prevention research in the Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis.

Welcome and Purpose of Day - Maria Stokes & Mo Gimpel

Overall purpose - to ensure research on pre-activity exercise programmes for good quality movement in community youth footballers is relevant and feasible by:

- Engaging community youth football clubs to raise awareness of injury prevention
- Understanding challenges faced by clubs – players, coaches, parents
- Promoting exercise programmes for injury prevention and performance
- Highlighting the need for research to find optimal prevention programmes
- Exploring avenues that will be needed to influence policy makers
- Demonstrating the importance of coaches and players taking an active part in development and ownership of the research.

1. Keynote presentation: Injury prevention in youth soccer

Carolyn Emery gave an overview of how research at the Sport Injury Prevention Research Centre, University of Calgary in Canada, is informing injury prevention practice and policy in youth soccer. She outlined Four Steps in Sport Injury Prevention Research: 1) Surveillance (extent of injury problem); 2) Find the risk factors (cause); 3) Develop an intervention (validation); and 4) Introduce the Intervention (implementation). The Calgary 11+ project found neuromuscular training intervention to reduce lower limb injuries by over 48% and a paediatric study in under 13s to reduce injuries by 55%. Performance also improved and there were Healthcare Cost savings of \$4.2 Million (Canadian).

The key elements of the neuromuscular exercise intervention are: Warm-up (aerobic, dynamic stretching, agility); Strength (eccentric training of lower limb, hip and trunk muscles; Agility/ technical/coordination/plyometrics; and Balance activities. All components are important, yet more than 75% of coaches believed stretching to be the primary focus for injury prevention.



Key messages for preventing injuries in soccer:

- Make prevention and performance coaching priorities!
- Change warm-up culture towards programmes based on evidence-informed neuromuscular training (NMT)
- Focus on NMT warm-up behaviour change to achieve maintenance in the long-term.

2. Neuromuscular warm up study in community youth football

Nadine Booysen explained how poor movement patterns can cause abnormal loading on joints and how improving movement control through preventive exercise programmes may reduce abnormal loading to protect joints. The team have developed a Hip and Lower Limb Movement Screen to assess movement quality and identify movement control faults. The faults are then used to develop warm-up exercise programmes for a specific group or individual. The exercises build on the 11+ programme, with more focus on controlling hip and pelvic movement. Nadine described a study to examine proof of concept that training movement control could improve movement patterns, and test the feasibility of conducting a future randomised controlled trial. She discussed the challenges of recruiting from community based clubs, and examining acceptability and adherence of adolescent recreational footballers to exercises.

3. Behaviour change

Carly McKay discussed the requirements for behaviour change to be achievable. There needs to be confidence in coaches' knowledge and ability to run a new programme and confidence in players' ability to perform the exercises. She gave the example of New Year's resolutions being difficult to maintain, so strategies are needed to help adherence to exercises.

Key messages:

- Injury prevention is complex
- Knowledge exchange is critical
- Information knowledge transfer can improve knowledge mobilisation: answer the right questions, ensure output is accessible and acceptable, rapidly integrated
- Partnership is vital - stakeholders drive the research agenda and help mobilise results

4. Reducing injury and growing pains during the growth spurt

Sean Cumming explained how children grouped by age vary greatly in size and maturity, so athletes enter the pubertal growth at different ages. There is a linear relationship between growth spurt and skeletal fragility. Maturation 'bands' are based on percentage of predicted adult height.

- Implications of growth spurt increase injury risk
 - Athletes are vulnerable to injury particularly during heavy training
 - Acute stress fractures, reactive cysts, sclerosis
 - Peak in epiphyseal injuries (Osgood schlatter)
- What should we do:
 - Pre-participation screening
 - Regular assessment of growth (height/weight) and maturity to identify growth spurt
 - Assess flexibility and movement control screening, as these are likely to decrease during growth spurt, MSK fitness (bi/tri annually)
 - Maturity matched training programmes (split into groups)

5. General discussion on warm-up programmes - facilitated by Jo Adams

Key points:

- Role models: senior players more effective for influencing juniors than coaches
- Coaches need to be convinced that warming-up pays off – statistics needed to provide compelling evidence
- Less emphasis on injury prevention and focus more on performance.
- Need buy-in from parents
- Work with people who regulate training, so it is embedded (as in rugby)

- Need to influence people who determine the work of coaches to embed mandatory warm-up exercises into their training and practice, like First Aid
- Build warm-up exercises into school curriculum
- Avoid boredom and keep exercises exciting and motivating: need progression so the exercises change. They need to understand core elements but do not need to have fixed exercises, so they continue to change over time
- Weekly reports on (academy) players' risk (reasons - pain, growth spurt, workload) and change training accordingly. Players may be taken out of training to use the gym.

6. Tour of stadium



Public representatives
Jem Lawson on left
(patient and public
representative, Arthritis
Research UK Centre for
Sport, Exercise and
Osteoarthritis) and
Tessa Davies (parent of
footballer)

Mo Gimpel giving a tour
of the changing rooms



Professor Mark Batt
(Director of the Arthritis
Research UK Centre for
Sport, Exercise and
Osteoarthritis) pitch side
with visitor from New
Zealand, Duncan Reid,
Professor of Physiotherapy
from Auckland University of
Technology

7. 1st Team & Academy Injury Prevention Programmes at Southampton FC

Mo Gimpel shared insights into the exercise programmes used at Southampton FC and outlined the history that led them to focus on research to prevent hip problems. The Club has collaborated with various universities, including Oxford, Southampton and Bath, and has published several papers on their work. Mo showed a video 'Science Behind the Saints' about physical testing, warm-up and training. Many players have had hip and groin pain and others have not but an MRI study has shown that the majority of players have changes in hip structure. The Club introduced movement re-education using neuromuscular exercise programmes, which reduced hip and groin problems and the need for surgery, as well as other injuries. The Club now has a big focus on movement control and the 11+ warm up programme is tailored to the type of game ahead, in terms of what load they will experience during the game.

8. Panel Discussion: Building Community Partnerships in Injury Prevention

Facilitated by Carolyn Emery

Expert panel of coaches from Professional & Community Clubs to discuss building community partnerships in injury prevention - Facilitated by Carolyn Emery

Coaches: Alan Crozier (Portsmouth Football Club Ladies), Martina Heath (Southampton Ladies FC), Mike Nolan (Luton Town Ladies FC), Sam Scott (Southampton Football Club), Jordan Tyrer (Liverpool Ladies FC)



Harmony along the M27! Peacekeeper Mike Nolan, explaining the benefits of collaboration, is successful in uniting coaches from Southampton FC (Martina Heath) and Portsmouth FC (Alan Crozier), seen here sitting side by side!

Key points from panel discussion:

- How big is injury in youth football?
 - Chronic injury in youth impacts on choice of contract and performance. Long term injuries can prevent players getting scholarships.
 - Young players mainly think of injury as being immediate contact/impact injuries rather than chronic, overload or long-term injuries
 - Injuries can have big social and psychological effects on players when they are away from the club for a long time.
 - Long-term injuries (6+ months) may prevent players going professional
 - Very important to keep the player on the pitch and so focusing on prevention is vital

- Whose responsibility is injury prevention and how do we implement it?
 - The whole club needs to be on the same page/work together - coach, medical team, players, parents
 - Stake holders of the club
 - Important to educate parents to help players be responsible for preventing and managing their injuries
 - Injury prevention possibly more important than performance and keeping players on the pitch

- Coaches' concerns about chronic injuries or acute/traumatic injuries
 - Coaches want to prevent all injuries and need to get players to be truthful with them when they have an injury ('Tell me, don't hide it')
 - Small injuries should not be ignored by players
 - The player/coach relationship is very important from a young age
 - Education and trust are important issues

- If time is limited, what warm-up exercises are best to do?
 - The focus at grassroots needs to be on balance and not just ball skills
 - Players can get frustrated with training. Variety is important as players often just want to play football or do training related to football
 - The coach needs to be educated enough to drive it and prevent injury

- Culture change in women's football
 - There has been a change in culture in female training (Southampton FC / Hants FC). It was reactive with a skeleton staff but now it is mirroring the men's levels of training and treatment
 - Women's game is catching up with the men's from injury prevention perspective

- Where are resources for the warm-ups?
 - 11+ material online
 - Speak to larger local clubs
 - YouTube

- Workshops for coaches
 - The FA could be asked to put on workshops specifically for warm-up programmes for grassroots coaches
 - FA Coach Mentor Programme may be a good route to educating coaches

9. Performance benefits of injury prevention programmes

Darin Padua discussed the challenges translating research into practice and how performance improvement could help with delivery of injury prevention programmes. Performance is obviously very important to players and there is increasing evidence that dynamic warm-up increases performance, so this could be a powerful motivator for players. The three areas of translation are: reach, adaptation, maintenance. The neuromuscular warm-up exercise programmes improve movement control, which not only allows good alignment to develop power but also control in slowing down i.e. braking. Integrating movement control into strength and conditioning has been shown to be beneficial. Injury prevention and good movement control (quality) increases player availability and there is some evidence to show that this improves team performance. Movement quality can be trained through neuromuscular exercise programmes.

10. Panel Discussion: Hearing from the field - Player perspective



Facilitated by Jem Lawson (right).

Players Emily Paines (middle), of Portsmouth FC Ladies, and

Jack Smith of Eastleigh FC

Emily and Jack kindly shared their own experiences of injuries, why injury prevention is important and what needs to be done to make prevention a routine part of football. Key discussion points that need to be considered for developing and implementing injury prevention programmes include:

- Importance of feedback when doing a warm-up programme, so players do movements correctly
- Performance possibly more important than injury prevention for young players
- Some players want to do their own routines
- Injury prevention needs to be handled carefully, so that players do not walk out onto the pitch wondering whether will get injured. Making prevention and integral part of training and warm-up would help to avoid this

- Performance after movement quality warm-up intervention – Jack took part in Nadine Booyen’s feasibility study and shared some of his experience of being involved:
 - More alert during games
 - Quicker to react during games from a sprint
 - Feeling more ready when did the programme
 - Better acceleration
 - Sharper with movements - warm up programme helped performance
 - I do the programme personally about three times a week on my own
 - Continues to do the programme as a routine to improve performance and prevent injuries

- What will make people do a programme like this?
 - Make the exercises easy to start with, so it doesn’t affect training. Once players get used to the movements, then they could be progressed.
 - All down to player buy in. If you’re motivated enough and know it will benefit you, you will then get to do it. Not always possible to get a whole cohort motivated, so need to find ways to improve player buy in.

11. Warm-up programmes - what helps and what prevents you using them?

Discussions took place in small groups, which were facilitated by Jo Adams & Jem Lawson. Groups were asked to note down key points in post-it notes: pink for things that help players do warm-up programmes and green notes for things that prevent them. The findings from this exercise are being analysed by Paul Muckelt and Jo Adams, and will be included in a small paper for publication. Once published, participants will be sent details of the paper, which will also be posted on the Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis website.

12. General Discussion: Next Steps - community youth football injury prevention; identifying research needs. Facilitated by Maria Stokes

- Way to enhance warm-up programmes becoming routine
 - The lower the level, the more role models are needed
 - Need to see Premiership players doing warm up to motivate young players
 - Education of coaches and players will help
 - The younger you start the better, even at 5 years
 - Knowing research will be disseminated will help buy-in
 - Feedback on personal level about results would be helpful
 - Cards of exercises with Premiership players' pictures and autographs
- Factors preventing players doing warm-up exercises
 - Lack of support staff - not feasible in grassroots clubs
 - Sharing information is limited
 - Managing expectations of different players
 - Researchers do not always know enough about the topic they are working on
- Areas needing research:
 - Statistics are needed on how many players return to play after injury
 - At what age should the programme be introduced?
 - Don't need more studies on 'does this work', need to know how best to implement the intervention
 - Have a political side to the research to influence public health policy and training of coaches
 - Need to know - do the costs outweigh the benefit? (savings to NHS?)

13. Future communication on activities after this workshop

This workshop was arranged by the Football Task Group of the International Movement screening and Interventions Group (IMSIG) within the Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis. See website for updates through the following link:

<http://www.sportsarthritisresearchuk.org/international-movement-screening-and-interventions-group-imsiq/imsiq.aspx>

We need players, coaches and physiotherapists to act as public representatives from grass roots and professional clubs to work in partnership with researchers. This will ensure the most relevant research questions are asked and that studies are carried out in the most appropriate ways to find solutions that will benefit players and help them adopt warm-up exercise programmes as part of their normal routine. Those who volunteered at the Workshop have been contacted but if you are interested in being a public representative, please contact Jo Bartram:
email: Joanne.Bartram@nottingham.ac.uk

Participants

Name		Institution / Affiliation
Jo	Adams	University of Southampton
Jo	Bartram	Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis Centre Administrator: Joanne.Bartram@nottingham.ac.uk
Mark	Batt	Nottingham University Hospitals NHS Trust
Nadine	Booyesen	University of Southampton
Alan	Crozier	Portsmouth Football Club Ladies
Sean	Cumming	University of Bath
Tessa	Davies	Parent Representative – Eastleigh FC
Frederick	Duke	Romsey Town Youth FC
Carolyn	Emery	University of Calgary
Mo	Gimpel	Southampton Football Club
Janice	Goble	Warsash Wasps Sports & Football Club
Martina	Heath	Southampton Ladies FC
Jem	Lawson	PPI Representative - Centre SEOA
Carly	McKay	University of Bath
Pedro	Monteiro	MLTNC/AFC Totton
Paul	Muckelt	University of Southampton
Mike	Nolan	Luton Town Ladies FC
Darin	Padua	University of North Carolina at Chapel Hill
Emily	Paines	Portsmouth Football Club Ladies
Jon	Parry	Bournemouth Sports FC
Shaun	Patterson	Fawley Falcons FC
Paul	Porter	Waltham Wolves U14s
Conor	Power	University of Southampton
Mikolaj	Pujdak	Watford Ladies FC
Duncan	Reid	Auckland University of Technology
Sam	Scott	Southampton Football Club
Jack	Smith	Player Representative – Eastleigh FC
Chelsea	Starbuck	University of Salford
Maria	Stokes	University of Southampton
Rob	Treanor	Bristol City Women's
Glyn	Tribe	Fawley Falcons FC
Jordan	Tyrer	Liverpool Ladies FC
Aaron	Wallace	Saints Foundation
John	Walsh	Actonians Football Club
Dave	Wilson	University of Southampton

Speakers and Facilitators

Professor Jo Adams

Professor of Musculoskeletal Health, Faculty of Health Sciences, and Director of FortisNet, Institute of Life Sciences, University of Southampton

Expertise: Occupational Therapist by background. Research focusses on effectiveness of self-management for people with musculoskeletal diseases.

Nadine Booyen

Senior Musculoskeletal Physiotherapist at Solent NHS Trust and NIHR Clinical Doctoral Research Fellow, Faculty of Health Sciences, University of Southampton.

Expertise: musculoskeletal physiotherapy; research focuses on assessment of movement control patterns and neuromuscular exercise programmes for prevention and management of musculoskeletal conditions. She developed the Hip and Lower Limb Movement Screen to assess movement quality.

Dr Sean Cumming

Senior lecturer in Sport and Exercise Sciences, University of Bath.

Expertise: research focuses on growth and maturation in the contexts of sport and exercise. Worked in research and consultancy roles for a number of governing bodies and professional clubs.

Professor Carolyn Emery

Associate Dean Research & Professor, Faculty of Kinesiology at the University of Calgary; Chair, Sport Injury Prevention Research Centre (International Olympic Committee), Canada

Expertise: background in physiotherapy. Research focuses on injury prevention in youth sport and recreation, concussion and paediatric rehabilitation; aimed to reduce the public health burden of injury including long-term consequences (e.g. post-traumatic osteoarthritis).

Mo Gimpel

Director of Performance Science, Southampton Football Club

Expertise: Physiotherapy in football

Jem Lawson

Patient and Public Involvement (PPI) Representative, Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis

Expertise: has had various roles: PE teacher, a coach, an official, a race organiser and managed national elite triathlon teams, now primarily sports administration and governance at national and international level. Jem is an age group triathlete and the current British Open Water Swimming Champion in his age group.

Dr Carly McKay

Lecturer in Injury Prevention, Department for Health, University of Bath

Expertise: Research into on psychosocial and behavioural factors in sport injury risk and recovery; behaviour change for injury prevention.

Professor Darin Padua

Professor and Chair of Exercise and Sport Science, and Director of the Sports Medicine Research Laboratory, University of North Carolina, USA

Expertise: Research focuses on prevention of sport-related musculoskeletal injuries - specifically, the role of movement quality and biomechanics in ACL and other lower extremity injuries and developing effective interventions.

Sam Scott

Lead U9-16's Strength & Conditioning Coach, Southampton Football Club

Expertise: training programmes, movement screening, nutrition.

Professor Maria Stokes

Professor of Musculoskeletal Rehabilitation and Head of Active Living Technologies Research Group, Faculty of Health Sciences, University of Southampton; Southampton lead for Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis.

Expertise: Background in physiotherapy and neuromuscular physiology. Research focusses on active living and healthy ageing of the musculoskeletal system – mechanisms of dysfunction, assessment tools and exercise interventions to prevent and manage joint conditions.

The Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis and FortisNet ('Strength through Collaboration' Institute of Life Sciences, University of Southampton) are very grateful to all the UK and international visitors and attendees who contributed to the workshop, as well as to Southampton FC for hosting the event.