The rationale and background for this work in relation to athlete welfare

In recognition of research evidence and athlete testimonies of sexual harassment and abuse (SHA) in sport, an expert panel was brought together by the IOC Medical Commission in 2006 to examine this problem. The group prepared a Consensus Statement on Sexual Harassment and Abuse (SHA) that defined the issues and identified a set of recommendations about policy and practice to both prevent and to manage the problem within sport organisations. The resulting Consensus Statement was published by the IOC Executive Board in Feb 2007. Following its dissemination, the IOC Medical Commission sought to develop practical measures by which SHA could be prevented. The work was divided into two phases. The first phase, targeted at child athletes (under 18), was delivered through a set of on-line materials used by participants at the Youth Olympic Games (YOG) in Singapore August 2010. This presentation will discuss the rationale for the work and its underpinning values.

Margo Mountjoy

The empirical research base underpinning the development of the tool

This presentation will show how the materials were based on an extensive review of research and policy within and beyond sport: key messages were then converted by an IT company into age-appropriate, direct access, on-line messaging. Users at the YOG were supported on-site by qualified counsellors. Back up materials were posted on the IOC website for those who wished to learn more.

Kari Fasting

The policy base underpinning the development of the tool and a practical demonstration

Phase 2 of the SHA project was divided into two parts: the first focusses on the actions that sports organisations should take to prevent sexual harassment and abuse in sport, as part of their policy portfolio. The education tool defines the nature of the problem and the actions that international and national sports bodies and federations can take to prevent it. It describes the key policies, procedures and practices that all organisations should put in place and provides links to key resources and examples of best practice to support development and implementation. The second part of the Phase 2 work focusses on how adult athletes (over 18) and coaches can protect themselves from SHA in a sport context. It defines the nature of the problem and the actions that coaches and adult athletes should take if they have concerns. The focus for athletes is on age-appropriate education to facilitate understanding of the types of SHA in sport, the identification of risks and tools to manage these risks. Preventative coaching strategies are addressed using practical scenarios. Athletes and coaches are made aware of their responsibilities for SHA prevention and reporting as part of their wider ethical, civic and professional roles. Excerpts from the online tool will be shown.

Anne Tiivas
Body composition and its assessment in Sports

Body weight and body composition is an important factor to enable optimal performance in many sports. However, the health of the athletes can be severely threatened by current weight loss practices with serious consequences. The primary concern of the IOC Medical Commission is that the protection of the athlete's health must have precedence over all other perspectives. The IOC Medical Commission has set up an ad-hoc working group dealing with research questions in the field of body composition, health and performance to address issues related to these topics in weight-sensitive sports. Three groups of sports are emphasised: aesthetic sports, weight-category sports, and gravitational sports. An important step on this path is the ability to assess the athlete’s body composition with accuracy, precision and reliability. Many techniques and equations for assessing values of body composition have been proposed, but all have some inherent problems, whether in measurement methodology or in the assumptions they make. Accuracy, precision and validity of methods will be in the focus of interest. A focus will be on high accuracy obtainable with a recently developed ultrasound technique for subcutaneous adipose tissue (SAT) thickness measurement, and a new weight index (MI) which considers the individual's leg length will be discussed.

Wolfram Müller

Hydration

Acute dehydration to make weight is an integral part of many sports, with a variety of methods used to achieve the necessary loss of body water. Exercise (often in the heat while wearing plastic suits), sauna use, fluid restriction, vomiting and purging are all used on a more or less regular basis. The frequency and severity of these practices varies greatly between individuals. The opportunities for rehydration between weigh-in and competition is dictated by the rules of the sport, but jockeys, for example, must weigh out as well as weighing in, so many are chronically hypo-hydrated over a day’s racing. Some modifications to the existing rules might help protect the health of the athletes, but inevitably there are practical difficulties in implementing any change. Problems and possible solution strategies will be developed and discussed in this symposium part.

Ronald J Maughan

How to minimize risks for athletes in weight-sensitive sports

A focus on low bodyweight and low body fat content, combined with regulations in some weight-sensitive sports, are considered risk factors for extreme dieting and related health consequences among athletes. There is no consensus on when the athlete is too lean, when to raise the alarm or to remove athletes struggling with extreme dieting or eating disorders (EDs) from competition. On the basis of medical considerations as well as performance it is important for support teams to know how to approach elite athletes who need/want to change body composition, and simultaneously prevent EDs. There are no simple answers to this issue that can be applied unilaterally, because factors indicating health risks vary among individuals. However, the BCHP group suggests changes to regulations that may be capable of reducing health risks. Some examples include: Timing of weigh-in, maintaining weight classes consistent from National to International events, providing more weight classes especially in low to middle weight categories, not allowing athletes to change to a lower weight class within a season, accepting weight allowances within given limits and BMI as a measure of relative weight in regulations should only be used as a temporary approach until more valid solutions become available. Further research in the field of Body Composition and Health and Performance should be conducted in order to develop this trans-disciplinary field of research, which is of high importance for both athletes' health and for their optimum
Healthy Body Image in Sport
Sundgot-Borgen, J*; Carter, S*; Sherman, RT
1Norwegian School of Sports Sciences, Norway; 2Colorado Gynecology Consultants, United States; 3Center for Counseling and Human Development, United States

Revealing Sport Attire and Its Potential Effects on Competitive Thinness, Body Dissatisfaction, and Disordered Eating

Body Image in Sport has multiple implications for sportswomen. Most important, serious medical and psychological consequences can occur in sportswomen with poor body image. This presentation will address how revealing sport attire and its related psychological issues of competitive thinness, upward body comparisons, and the belief that the leaner sportswoman will look and perform better, can contribute not only to poor body image, but also to body dissatisfaction and disordered eating. Implications and recommendations for sport and health care professionals will also be addressed.

Roberta Trattner Sherman

Is it possible to prevent athletes from dieting to win?
Adolescence is the age range in which most elite athletic participation and competition takes place and it is also during this period females experience a rapid change in body composition and shape. For athletes, these changes in body composition and often body image might affect their attitudes to weight and shape, their athletic performance and increase the risk for eating disorders. The prevalence of eating disorders is higher in both adolescent and adult elite athletes than controls and higher in female than male athletes. Early identification and prevention of the triad components have been suggested. Is it possible to prevent risks associated with eating disorders and clinical eating disorders in young athletes? Results from the very first randomized controlled intervention study aiming to prevent eating disorders in adolescent male and female elite athletes will be presented.

Jorunn Sundgot-Borgen

Is the impact of eating disorders recognized by health care providers?
Body image disturbance is the condition in which an individual is not satisfied with their perceived appearance, creating appearance management behavior. Routine appearance management behavior is common, including mild changes that make one’s perceived body image more positive. Examples are changing one’s hairstyle, or changing a clothing trend. Non-routine behaviors can be detrimental, such as extreme eating habits, obsessive exercise, or drastic cosmetic surgery. Disordered eating includes caloric restriction and binge-purge cycling. Physically, numerous organ systems are affected, often with long-term sequelae. The psychological and emotional toll is also significant, on all individuals involved. Do clinicians recognize the physical and psychological long-term effects of eating disorders? Health risks of eating disorders and the associated appearance management behaviors of body image disturbances will be reviewed in this clinical presentation.

Susan Carter

Athlete Welfare
Rhind, DJA; Gervis, M*; Oliver, J*; Tiivas, A*; Proudlove, S*; Raakman, E*; Dorsch, K; Hartill, M*; Lang, M*; Kerr, G
1Brunel University, United Kingdom; 2Cardiff Metropolitan University, United Kingdom; 3Child Protection in Sport Unit, United Kingdom; 4Just Play, Canada; 5University of Regina, Canada; 6Edge Hill University, United Kingdom; 7University of Toronto, Canada
“The ends justify the means”: Perceptions of Emotionally Abusive Coaching
Research has explored the experiences of elite athletes who have been emotionally abused (Gervis & Dunn, 2004; Stirling & Kerr, 2009). Elite child athletes in particular have been identified as being at a greater risk of being emotionally abused (Gervis, 2009). This presentation focuses on the first experimental study in this field which investigated the factors which underlie people’s perceptions of emotional abuse in sport. A sample of 150 coaches and athletes were shown a series of vignettes which described emotionally abusive coaching. The competitive level and athletic outcome were manipulated. The data will be analysed to highlight key influential factors.
Misia Gervis and Daniel Rhind

Physical conditioning and wellbeing of (elite) child athletes
The benefits of physical activity during childhood are well recognised. However, in elite populations, physical activity may reach extreme levels, with children exposed to large training and competition loads. While such training regimes may be viewed as necessary to develop children into potential elite senior competitors, empirical evidence is less clear. Current training practice is often heavily bias towards physical conditioning. This approach to youth training can have limitations and associated risks that could potentially have a negative effect on athlete wellbeing. Risks can include inappropriate training, a lack of psycho-sociological development opportunities, overtraining, burnout and increased injury risk.
Jon Oliver

Ten years of the Child Protection in Sport Unit: Achievements, reflections and future challenges
The National Society for Prevention of Cruelty to Children’s (NSPCC) Child protection in Sport Unit (CPSU) is the world’s leading organisation working with the sports sector to promote, facilitate and support the safeguarding of children within sport. The Unit was created 10 years ago in response to growing concern about the impact upon both children and sports bodies, of several high profile child protection investigations into abuse of children within sport. Working in partnership with sport bodies, statutory agencies and government departments, the work of the Unit has changed the face of safeguarding and child protection within the sports sector. Our presentation will inform you about the achievements that have marked this journey and the challenges that we anticipate for the future with regards to safeguarding within sport.
Anne Tiivas and Sally Proudlove

Children’s Rights in Youth Sport: Obstacles and Optimism
At the same time that government agencies (Green, 2006), international governing bodies (David, 2005; UNICEF, 2010), and even municipal governments (Coalter, 2007) increasingly develop sport related policies for social investment and development, research reveals that sport does not in and of itself have positive psychosocial outcomes (Arthur-Banning, Wells, Baker & Hegreness, 2009). Given this dichotomy, it is critical that we reconcile the ends with the means. Our proposed solution involves the development of policies that are based on human rights, in particular children’s rights, as defined by the United Nations Convention on the Rights of the Child (UNCRC). David (2005) asserts that 37 of the 42 substantive articles of the United Nations Convention on the Rights of the Child (UNCRC) are directly related to sport. A framework, therefore, exists for effective policy. This study examines how the autonomy of sport governing bodies has fostered an environment that has failed to protect the rights of children. In addition, we demonstrate that a simple monitoring solution can help to establish systems of accountability that support effective policy.
Elaine Raakman, Kim Dorsch and Daniel Rhind

The impact of Child Protection Policy on Practice
This presentation will report on and consider two recent studies into child welfare issues within sport. The first study examined the extent of coaches’ concerns regarding accusations of child abuse in competitive youth swimming. The second utilised Brackenridge et al.’s (2005) ‘Activation States’ model to establish the current position of ‘safeguarding’ within a sport following the implementation of a child protection programme by the national governing body.
Mike Hartill and Mel Lang
The Role of Parents in Promoting Child Protection in Sport

Previous research indicates that parents not only socialize their children into sport but are in turn socialized into the sport culture through their children’s participation. Parents learn to acquiesce to the authority and power of the coach and the sport culture’s emphasis on performance. One of the consequences of such socialization is that parents can become silent bystanders to their children’s experiences of maltreatment in the coach-athlete relationship. Contrary to the athlete development models that suggest that parents can increasingly withdraw from the athlete’s experience or take a secondary role to the coach-athlete relationship as the athlete reaches more competitive levels, studies of athlete abuse suggest that in order to protect athletes from problematic or abusive coaching practices, parents should remain highly involved in the athlete’s experience. Processes for doing so will be discussed.

Gretchen Kerr

Somatotype, 3D scanning and Digital Anthropometry

Marfell-Jones, M; Stewart, AD; Olds, T; Olds, T

1Open Polytechnic, New Zealand; 2Robert Gordon University, United Kingdom; 3University of South Australia, Australia

The desire to categorise human physique has prevailed since the times of ancient Greece. In the development of the somatotype, most practitioners in the early 20th Century relied on photography of the participant in a standard pose wearing minimal clothing, and assessment of relative musculo-skeletal development, adiposity and linearity. After the term ‘somatotype’ was popularised by Sheldon, a range of researchers developed methods according to different criteria. However most were criticised as being rather subjective, and when the anthropometric methods arose, they almost completely replaced the earlier photoscopic method. This symposium traces this historic development, and offers a critique on its strengths and weaknesses. It then introduces the very latest technology into the arena: 3D photonic scanning. This involves capturing 3D body shape rapidly and accurately in a fraction of the time taken to measure the body by traditional anthropometry. With actual data on body shape including curved surface distances, areas and segmental volumes, together with semi-automated analysis, this method offers the promise of combining the best of both methods for describing the human phenotype. In this symposium experts in anthropometry and 3D scanning will provide examples of data assessed by the photoscopic method, and introduce the concept of a new computer-generated clustering technique to describe physiques.

Therapeutic Use Exemption Process

Jenoure, P; Pipe, A; Thormann, S; Gösele, A

1ARS Medica, Switzerland; 2University of Ottawa Heart Institute, Canada; 3Nationale Anti Doping Agentur Deutschland, Germany; 4Crossklinik, Switzerland

Around the TUE’s, the Therapeutic Use Exemption

The never ending attempt of enhancing performance at any price and the now over 50 years lasting fight against these doubtful efforts, the so call anti-doping policy, has constantly made evolution to a very complex (battle) field of activity with many protagonists. These include: governments with their custom and police services, the international and national sport authorities, specific organisations with armies or specialists as lawyers, pharmacologists, geneticists, ethicists, to name only some of them against representatives of underground criminal organisations, high-level scientists with underdeveloped sense of responsibility, cupid and profile neurotic entourage of athletes and overambitious badly educated and informed athletes.

And where are the doctors in all this? Classically, the doctor is a pill and drug prescriber, so who could be a more suitable suspect or even the guilty person? It is quite surprising to ascertain this rather simplifying equation even in society parts where the anti-doping question is treated! A practical consequence is the exclusion of doctors from
most official institutions dealing with the matter, which perhaps have concrete advantages for them, as they are probably at highest risks of sanctions if really they are involved.

But despite these facts, which should convince any reasonable physician to avoid contact with this field, there is an area where physicians are indispensable. This is the area of the so called therapeutic use exemption (TUE).

Athletes, like all people, may be taken ill or find themselves in a situation that requires the use of particular medications or treatments. However, the substances or methods that athletes could be required to use for treatment may feature on the Prohibited List.

In this case, a Therapeutic Use Exemption (TUE) may, under certain well-defined and restricted conditions, enable athletes to take the necessary medication whilst competing in sporting events without resulting in a doping offence. The four criteria that must be fulfilled before a TUE is granted by a so-called TUE Commission (TUEC) are set forth in the International Standard for TUEs.

1. “The Athlete would experience a significant impairment to health if the Prohibited Substance or Prohibited Method were to be withheld in the course of treating an acute or chronic medical condition.”
2. “The therapeutic Use of the Prohibited Substance or Prohibited Method would produce no additional enhancement of performance other than that which might be anticipated by a return to a state of normal health following the treatment of a legitimate medical condition. The Use of any Prohibited Substance or Prohibited Method to increase “low-normal” levels of any endogenous hormone is not considered an acceptable therapeutic intervention.”
3. “There is no reasonable therapeutic alternative to the Use of the otherwise Prohibited Substance or Prohibited Method.”
4. “The necessity for the Use of the otherwise Prohibited Substance or Prohibited Method cannot be a consequence, wholly or in part, of prior non-therapeutic Use of any substance from the Prohibited List.”

A TUE may be granted only if these four criteria are fulfilled. As the treating person of an athlete competing at a level where the anti-doping regulation is valid, the sports physician must be well aware of these rules in order to prescribe the adequate therapy to his athlete-patient. Or he can be called to act in a TUEC only composed by medical specialist. So the TUE is the last area in the full hands of medical doctors, those who historically, in the 1960s, created the whole anti-doping movement that we know now, worried they were to see young human beings dying from drug misuses during sport activities.

The TUE process is a good one, but it is a complex one. It has a history that begins before the start of WADA’s work: it has needed long and thorough work from the side of WADA in consultation with its stakeholders. It has been a tough issue for the National Anti-Doping Organisations and the International Federations which receives the requests from the athletes and their doctors. It is also sometimes a complicated task for the treating doctor, mostly not well informed and trained in regard to this unique administrative step in the course of a normal treatment. We will review these different aspects of the complexity of the TUE process out the sight of the various responsible persons, from the user to the decider to the legislator.
How Much is Too Much? Training of the Young Athlete

Williams, CA*; George, K*; Maffulli, N*; Atkinson, J*

1University of Exeter, United Kingdom; 2Liverpool John Moores University, United Kingdom; 3Queen Mary University of London, United Kingdom; 4Lilleshall National Sports Centre, United Kingdom

Training Overload in Young Athletes

Professor Craig Williams in setting the scene for the three main speakers outlines the consequences of getting the training overload principle wrong. Whilst there is much debate about optimal loads of training for youngsters, are we more confident in our judgement when too much training has occurred? One recent study on English youth athletes showed evidence for non-functional overreaching and overtraining with significant impact on performance, health and social domains. At its worst, chronic mis-application of the overload principle can lead to injury and drop out. In the next three presentations these issues will be discussed.

Craig Williams

Exercise and the Adolescent Heart - Can you have too much of a good thing?

Regular physical activity (PA) in children can have short and long-term benefits for cardiovascular health. Attaining 60 min of moderate-vigorous PA is a challenge for many children, however, in a small grouping of children their training and sporting commitments mean that they vastly exceed current PA guidelines. The impact of high levels of PA on cardiovascular structure, function and health in children is not clear. Recent studies in adults report evidence of exercise-induced cardiac fatigue and damage. Whether these phenomena are apparent, or even augmented, in the maturing heart is the focus of this presentation.

Keith George

The Young Athlete and Injuries

Physical activity plays a significant role in the physical and emotional well-being of a child. In the past 15 to 20 years, there has been a dramatic increase in sports participation at a young age, which has offered numerous health benefits, including of self-esteem, confidence, team play, fitness, agility, and strength. Children are playing sports at younger ages. There are no definitive epidemiological data on withdraw from sports activities due to injury in young athletes. Disturbed physeal growth as a result of injury can result in length discrepancy, angular deformity, or altered joint mechanics, and may cause significant long-term disability. Sequelae of Osgood-Schlatter lesion include painful ossicle in the distal patellar tendon. Fragmentation or separation of the apophysis appears to be the result of adaptive changes to the increased stress that occurs in overuse activities. The presence of these changes undeniably demonstrates an osseous reaction, although they are not disabling. Promotion of a physically active lifestyle is encouraged worldwide, particularly with regard to the many health benefits. Reduction of only a moderate proportion of all sports injuries is of significance for the young athletes’ health and could have a long-term economic impact on health care costs. It is therefore important to convince medical doctors, physical therapists, athletic trainers and coaches, as well as athletes of the necessity to implement active prevention measures in their therapy and training programs, thus decreasing the injury and re-injury rate and enhancing athletic performance.

Nicola Maffulli

Gymnastics and Training – Application of Training

British Junior and Youth male gymnasts rank among the very best in the world – how has this been achieved? The implementation of improved dedicated facilities and the increased scientific training of coaches have made a great difference but it is in the application of training that the true success is revealed. Preparing young performers in this highly competitive art form requires a deep knowledge of physical preparation, particularly strength, flexibility and posture before skills are taught and linked. The use of training aids to monitor technical progress with the young is another major requirement in achieving perfect line in basic elements. These respective contributions will be the focus of this presentation.

John Atkinson
Eligibility and Inclusion

Are We There Yet? International Perspectives on LGBT Inclusion in Sport
Krane, V*; Demers, G*; Shang, Y-T*; Symons, C*; Griffin, P
1Bowling Green State University, United States; 2Laval University, Canada; 3University of North Carolina at Greensboro, United States; 4Victoria University, Australia; 5Gay, Lesbian Straight Education Network Sports Project, United States

Research Perspectives from the United States
Recently in the US, there has been an increase in the dialogue concerning lesbian, gay, bisexual, and transgender (LGBT) athletes. Much of this focus has been anecdotal and addressed creating positive climates for athletes. However, the scholarly literature lags behind and there still is relatively little empirical work examining the experiences of LGBT athletes. What we do know is that sporting climates vary greatly. In this presentation, I will review the contemporary research about LGBT athletes in the US and highlight factors sustaining both favorable and undesirable climates. Current research has shed light on attitudes towards lesbian and gay males in sports by people in sport and kinesiology, which often paints a gloomy outlook. We also are learning about lesbian and gay male athletes who have come out in sport and have found supportive coaches and teammates. These supportive climates for mostly adult athletes will be contrasted with what we know about homophobic bullying that occurs among younger persons. Additionally, I also will discuss what we know about the experiences of transgender athletes in US sport.
Vikki Krane

A Perspective from Canada
This presentation will review the experiences, barriers, and facilitating factors of coaches working with (or who are afraid of coaching) LGBT athletes within Canadian sport, and will also highlight some key points to consider for coach training. I will present the results from interviews with 12 coaches about their fears, questions, and needs regarding coaching LGBT athletes. Through the interviews, the coaches realised that they knew little about LGBT athletes and that they were not ready to react if a problem were to arise. They also realised that they always assume that all their athletes are heterosexuals. After the interviews, a vast majority reported that they needed to learn more on this issue to better serve the needs of LGBT athletes. Although this research is exploratory in nature, identifying fears and especially needs has provided excellent avenues to better train coaches. This project is the first comprehensive study of the training needs of Canadian coaches who work with LGBT athletes (knowingly or unknowingly) and is providing rich insight into coaches’ challenges. These results will be used to better prepare coaches to work with this population and hopefully increase participation of LGBT people within sport.
Guylaine Demers

A Perspective from Taiwan
While the discussion of sexuality issues in sport has been addressed in Western society since the 1980s, little had been heard in Taiwan until 2006. With the lifting of Martial Law in Taiwan in 1987, an LGB rights movement started to emerge in the 1990s as a branch of the feminist movement in Taiwan. However, the discussion of sexuality issues rarely happened in Taiwan’s sport culture. Shang, Liao, and Gill (2006) conducted the first study examining the attitudes of collegiate athletes and coaches toward homosexual athletes. Liao’s (2007) and Chen’s (2009) master theses looked at the identity formation of gay student-athletes and lesbian recreation players respectively.

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Shang and Gill (2012) explored collegiate athletes’ perceptions of the sport climate for athletes with non-conventional gender expressions and sexual orientations. This presentation will review these studies, provide a more complete description of the sport climate in Taiwan, and discuss the changes and future directions by considering current societal developments in Taiwan and Western experiences.

Ya-Ting Shang

Australia with Some Reflections on the International Context

In the lead up to the Sydney 2002 Gay Games the Australian Sports Commission (ASC) launched one of the first educational resources for sport to address homophobia and sexuality diversity. This was followed by inaction and silence until a coincidence of activism, research and infamous homonegative commentary by a larrikin Australian Rules footballer, launched the issue of LGBT discrimination in sport into the national media and policy arena. As the lead author of the first comprehensive research report on the LGBT sport experience in Australia, titled ‘Come Out To Play’ (2010), I experienced this media frenzy first hand. During the previous year I had written the only submission addressing LGBT sporting issues to the major Federal Government review of Australian sport (Crawford Report, 2009). Preliminary findings of COTP were used in this submission, and during the resulting consultation of the ASC with LGBT community organisations in late 2009. Policy inclusion of LGBT people in sport and program funding ensued. After a brief overview of these major developments in LGBT inclusion in Australian sport and a summary of the main findings of COTP, I will give an overview of the first ever fully funded and institutionally supported sport inclusion project within Australia to promote gender and sexuality diversity – in the sport of field Hockey. This project is innovative, successful in community engagement at all levels of the sporting code, is transferable and has been thoroughly evaluated. I will complete my presentation with some more broad ranging reflections on this transitional period for LGBT sport inclusion. We are starting out, with positive developments that include changing community attitudes, but with a fair way to go.

Caroline Symons

Advocacy and Education Initiatives in the United States

During the last 18 months, the United States has experienced an explosion of media discussion and advocacy initiatives focused on improving the climate for LGBT people in sports at all levels: K-12, college and professional. In addition to organizational programming, individual athletes, both heterosexual and LGBT have taken more visible and public positions advocating for respect, inclusion and safety for athletes and coaches of all sexual orientations and gender identities/expressions. Such initiatives as Changing the Game: The GLSEN Sports Project focus on K-12 school physical education and athletes. Athlete Ally, the Out to Play Project and Freedom Sounds, focus on collegiate sports. Other initiatives such as the You Can Play project focus on professional sports. Adding to these initiatives, two national gatherings, one focused on collaborations among LGBT sports researchers and advocates, and the other focused on collaborations among LGBT sports advocacy groups, have significantly advanced the agenda of making sports in the US welcoming for LGBT participants. This presentation will review these developments and provide a critique of these initiatives through the lenses of race and gender. A review of similar developments in the UK will also highlight how the movement to change the sports climate for LGBT athletes and coaches in Western, English speaking countries has advanced.

Pat Griffin

Quality Physical Education for Girls – Myths and Realities around the Globe

Rocha Ferreira, M*1; Koushkie Jahromi, M*2; Al-Sinani, Y*3; Pfister, G*4; Benn, T*5
1 State University of Campinas, Brazil; 2 College of Education and Psychology, Shiraz University, Iran, Islamic Republic of; 3 Sultan Qaboos University, Oman; 4 University of Copenhagen, Denmark; 5 President International Association of Physical Education and Sport for Girls and Women, United Kingdom

Historical Perspectives and Gender Balance in Physical Education in Brazil

The Brazilian political and educational systems were influenced by the Portuguese colonization. The European immigrants (Italian, Japanese, German and Polish) settled predominantly in the south and southeast regions.
Swedish gymnastics, French methods of gymnastics and sports, Listello’s generalized sport method, and legislation emphasizing sport practices were introduced. The hygienic, moral, military, nationalist, eugenic, medical and masculinity arguments formed the basis for the development of physical education and sport. The first laws advantaged males in hours and types of physical activities, favoring boys’ military exercises and discipline. Early female activities favored pursuit of the harmony of beauty, the feminine figure and the demands of future maternity. The process of change in gendered provision has been slow but continues. Following the 70th anniversary of the start of physical education programs, classes and opportunities are the same for both sexes, although male power remains dominant. The scientific approach towards physical education contributed to gender knowledge, development and discussion in sport and did much to improve opportunities for girls and women in the field.

Maria Rocha Ferreira

Progress for Girls and Women in Physical Education in Iran
In Iran, education in all subjects, including physical education, has a long history. The purpose of this study is to discuss development in physical education for girls across the different grades of schools and to evaluate the general changes during five decades. Discussion involves acknowledgement of socio-cultural influences, including parental and student attitudes towards physical education. As with all education in Iran, physical education lessons take place in sex segregated classes from elementary to high schools. Physical education lesson syllabuses include physical fitness components and sport skills. The quality and quantity of provision in physical education has undergone many changes for girls and boys. Changes in organizational hierarchy governing schools’ sport, the training and hiring of women coaches and teachers specifically for girls provision, and developments in syllabuses and sport resourcing, have been most influential in recent years.

Maryam Koushkie Jahromi

An Overview of the Unique Cultural and Social Factors Instrumental in the Establishment of the Initial Teacher Training Physical Education Program for Women and its Role in Oman
Being an Islamic county, the cultural practices in the pre-1970 era in Oman prohibited full participation of girls and women in life and education, which changed drastically under the new Sultan in the post 1970 era. This positive change led to the establishment of physical education in schools and other institutes of higher education as well as promoting educational aims for girls, where they had rights in education equal to boys. The impact of modernization, socio-economic development, feminization and Omanization in post 1970 Oman is crucial to understanding the situation in this study since the introduction of the Initial Teaching Training Physical Education Program for Women (ITTPEPFW) is one outcome of these processes. A programme in physical education teacher training for women cannot be understood outside of the overall societal context in which it belongs. Therefore, this review will consider key Omani influences such as the geographical, historical, socio-cultural, and religious factors unique to the Sultanate, on female education and physical education in Oman.

Yousra Al-Sinani

Girls and Women in Physical Education - Issues and Challenges in Denmark
In Denmark, environment and institutions such as after school day care and sport clubs encourage an active life style among the population. More than 80% of children are physically active. However, physical activity intersects with gender, social class and ethnicity. There are relatively large gender differences with regard to frequency and intensity; 40 % of the boys, but only 23 % of the girls participate more than 6 hours per week in sport (for all). Based on theoretical approaches to gender and socialization, it can be assumed that school and PE play a decisive role in the development of sport related habits and tastes. This presentation focuses on the results of a qualitative study on participation and “doing gender” in PE. Interviews and observations in the coeducational PE classes revealed that only a few girls joined the exercises and games of the boys. Many girls, in particular Muslim girls, did not feel comfortable or skilled enough to play with their male class mates. Many engaged in other activities, e.g. danced around or talked, while others did not even show up. The teachers focused on the boys and seemed to accept the “drop out” of many of their female students. Another interview study with older adults showed that the experiences in PE had an impact on the “sport biographies” of the informants. At the end of the paper, possibilities
and strategies for changes in PE are discussed.
Gertrud Pfister

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Too Fast to be Female? Caster Semenya and the Politics of Gender Verification in Sport

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1University of Edinburgh, United Kingdom; 2University of Sunderland, United Kingdom; 3Cardiff Metropolitan University, United Kingdom

Caster Semenya and the Politics of Gender Verification in Sport

Gender verification tests were introduced in the 1940s to prevent male athletes from entering female competitions. There have been few publicised cases of exclusion from competition. Recently, however, Caster Semenya, the South African 800 meter World Champion, was at the centre of controversy regarding her legitimacy as a woman. She was suspected of being a “gender fraud” (Heggie 2010) on the basis of her improved performance and speed, musculature and ‘masculine’ appearance. The aim of this symposium is the examination of some key philosophical, sociological and policy questions in a range of areas related to gender verification and sex segregation in sport. We will consider whether gender verification testing is legitimate, given that “scientific inquiry into sex is often inconclusive” (Buzuvis 2010, p.37). Conceptually, this inconclusiveness is no accident. As Jonnson (2007) has argued, problems attach to the sex categories themselves. Camporesi and Maugeri (2011) note, too, that “our ever-increasing knowledge of genetics challenges our ordinary binary thinking about sexual boundaries” (p.379). In addition, we examine the grounds of asymmetrical social responses to ‘freakish’ and successful male and female competitors. A Usain Bolt is feted as phenomenal, whilst a Caster Semenya is regarded as monstrous. Is there a partial explanation in the demonstration that hypermasculine qualities are attainable by a woman, and the consequent threat to the ideological foundations of the gender order? The International Association of Athletic Federations (IAAF) publicly questioned Caster Semenya’s sex a few hours after Semenya won gold in the 2009 Berlin World Championships. Their request to begin a range of medical tests, in order to determine whether Semenya is female, sparked a prolonged and intrusive scrutiny of Semenya’s personal life. We also explore in this symposium, some of the ethical and policy issues brought to light. We examine, among other things, the ‘fairness’ rationale for sex verification tests. This discussion incorporates the uncertain rationale of sex-segregated sport competition. Jones and Wilson (2009) have argued persuasively that sport’s diffuse conceptions of fairness are contingent and contextualised affairs. There seems no a priori demonstration, notwithstanding the preceding worry about binary sex categories, that fair competition demands strict segregation of the sexes. However, there might yet be a viable conception of fairness which grounds segregation. Finally, we explore the central ethical concerns that arise when dealing with information obtained from gender verification tests. For instance, in light of the sometimes massive consequences for the tested, should there be a right not to know the result?

Cara Aitchison, Paul Davis, and Lisa Edwards

References:
New Innovations In Sport For Athletes With Intellectual Disabilities Across Europe/Eurasia

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New Global Initiatives in Special Olympics

The mission of Special Olympics is to provide year-round sports training and competition in a variety (33) of Olympic-type sports for children and adults with intellectual disability, giving them continuing opportunities to develop physical fitness, demonstrate courage, experience joy and participate in sharing of gifts and friendship with their families, other Special Olympics athletes, and the communities. But Special Olympics Movement very often goes beyond sports competition formula. During last years the Movement develop many new global initiatives which expands its former sports activities:

1. Coaching excellence and coach model
2. Partnerships with international (regional) sport federations
3. Sport Resources Teams (SRT)
4. Extended quota for high level athletes
5. Athletes Leadership Program (ALPS)
6. Young Athletes Program
7. Youth-volunteers initiatives

These initiatives fulfill and expand existing from 1968 the biggest sports organization for people with disabilities word wide with very important new social, marketing and developmental aspects of life going far beyond activities met in other sports organizations.

Mariusz Damentko

Adapted and Inclusive Sports Training and Competition: A New Dimension for People with Intellectual Disabilities.

Special Olympics traditionally offers customized sports particularly for people with intellectual disabilities—called “athletes”. Changing attitudes towards people with intellectual disabilities using the means of sports is a key component of the Special Olympics mission. Over the past decade the inclusive “Unified Sports®” program has been developed very successfully, in particular in Europe/Eurasia. It is focusing on bringing opportunities to youths with and without intellectual disabilities to come together for regular training and competition on the same sports teams. Besides the concept is targeting at long term sustainable inclusive structures around Unified Sports teams and activities in the local community. The Unified Sports program alongside the traditional activities addressed particularly to Special Olympics athletes offers a choice to people with intellectual disabilities: Some may benefit more from a special needs sports activity, others may gain more from Unified Sports participation, some may even choose to join both options. This choice still is rather unusual nowadays. The usual picture is clearly separated in mainstream sports and special needs sports. People with intellectual disabilities are often automatically placed in the special needs sports section. On one hand Special Olympics can meet the needs of the key stakeholders, the athletes, better through giving choices. On the other hand Special Olympics challenges and changes traditional ways of thinking and acting in sports in general. This helps to change the climate and to open up new opportunities and choices for all in sport but also in society generally.

Sabine Menke

Special Olympics International Sports Strategic Initiative Survey

In March 2012 a global Special Olympics International Headquarters (SOI) survey was completed on 4 strategic initiatives: Athlete Development, Coaching Excellence, Quality Competition and Unified Sports. Athletes, Coaches, Family members, SO Program Directors from 29 SO Programs across 7 global Regions completed the survey. The Athlete Development Model strives to support and track the progress of the SO athlete at all stages of participation in training and competitions at all levels from the Young Athletes Program (2-8 years of age) through world class international competitions and recreational activities. Coaching Excellence addresses the need to educate and certify SO Coaches with sports specific knowledge. The Quality Competition initiative tackles the
desire for standardized high quality competitions. The Unified Sports initiative engages athletes with and without intellectual disabilities as teammates in an inclusive sports training and competition program to promote social inclusion and attitude change. Key findings confirmed that to improve the level of SO training and competitions SO athletes and coaches would benefit from additional sports resources to increase their sports-specific knowledge. SO athletes would benefit from a fitness/performance tracking tool and a home training program. The Unified Sports initiative builds SO public awareness and social inclusion.

Aldis Berzins, Mariusz Damentko, Sabine Menke

Flag Rugby, Inclusive Issues

The Flag Rugby game was born in 1992 in Sydney, Australia under the name of OZTAG. Perry HADDOCK former player of St. George Dragons (team of the Australian Rugby League) is the instigator. The Flag Rugby is a sport similar to a "non-contact rugby." This is a team sport, without any physical contact and no kicking game, which can be identified by a set of attack / defense phases. The Flag Rugby can be defined as a sport of avoidance, address and dexterity. It is played with an oval ball of small size (No. 3) and can occur anywhere, indoor and outdoor (lawn, synthetic, asphalt, sand, etc.).

The specificity and the approach of Flag Rugby make it a sport in itself, opening to a large population, of any age, disabled or not. It can be played in category male, female, in inclusive groups. The Flag Rugby is open to all, beginners or initiates of all levels and ages. The playful nature and specificity of the game are able to thrive in a sporting and friendly spirit. This sport, with simple rules and contactless gives pleasure almost instantaneously. Practicing a sport without fear stimulates more easily the potential to bring out the capabilities of each player. Beyond notions of pleasure, the Flag Rugby, unlike contact sports while rubbing the values of rugby, is an activity where everyone, regardless of physical ability, age and sex, can participate with confidence. The Flag Rugby is a social sport that requires at any time a collective commitment that develops social ties and relationships with friends and opponents of a day.

Special Olympics France has implemented Flag Rugby in many special schools in France and regularly organizes tournaments and sport events. We will present the results of a 2 years follow-up study aiming at analyzing the social confidence and inclusion perspectives of children and teenagers who practice this sport. The methods are based on observations of their participation during trainings and tournaments. The results show that this sport is an excellent tool to improve the self-esteem, social confidence and relationship between boys and girls, children with mild intellectual disability (ID) and those with a more profound ID. All players have the possibility to play a role and success, regardless of their particularities. The acceptance of difference is not always easy, especially within groups of youngsters with ID. The positive effects that we analyzed make Flag Rugby an appropriate tool that should be developed both in special schools as well as in the scope of inclusive settings.

Claire Brousier

Special Olympics Athletes and the World Games Experience

Aim: Special Olympics provides year round training and competition in 32 sports, in almost 180 countries, and with an estimated 3 million athletes with intellectual disabilities engaged on a regular basis. A particular highlight is the World Summer Games held every four years and most recently in Athens which was attended by almost 7000 athletes from over 170 countries. This study explored the impact on the athletes of their training and participation in these Games. Method: Quantitative and qualitative data were collected from 56 athletes and 21 coaches from four participating countries - Greece, South Africa, India, Costa Rica – and across seven different sports. This was done at four time points (at selection, during training, at the games, post-games) using local academics as co-researchers. Results: The training process saw a growth of athletes’ self-motivation and personal responsibility although improvements in terms of sporting skills were harder to discern. Inherent ambiguities in the purpose of the Games were reflected in the athletes’ attitudes to competition and winning which contrasted with the perspectives and approaches of their coaches who stressed participation. Conclusions: This study gives important insights into how people with intellectual disabilities can gain affirmation through sport and competition.

Sandra Dowling, Roy McConkey, David Hassan
Conducting Research With Female Athletes: Suggestions For Success
Ransdell, LB*; Oglesby, C*; Sell, K*
1Boise State University, United States; 2California State University, Northridge, United States; 3Hofstra University, United States

Introduction A significant barrier that stands in the way of improving performance in female athletes is the lack of research involving this population. There is some cross sectional research available, but few have conducted training or experimental studies dedicated to the female athlete, and there is little funding to pursue this line of research. The purpose of this symposium is to provide a multi-disciplinary overview of past, current, and future directions in research related to female athletes. Dr. Ransdell will introduce presenters from different fields within Exercise Science who will tell their stories about how they generate research topics, seek grant funding, recruit subjects, gain access to the population of interest, and ultimately publish their research.

Lynda B. Ransdell

University-Non-governmental Organization (NGO) Partnerships in Women’s Sport: The Face of the Future?
The past 20 years have seen the burgeoning of academic “Centers of Excellence” devoted to research and practice concentrated on specific foci allowing nimbleness and economy in the pursuit of resources not common in the traditional university department structure. Coincidently, many women-centered NGOs are experiencing the economic stresses of the times and searching for partners with human resources to collect/integrate the evidence base for their organizational programming. Taken together, these forces seem to be resulting in the creation of new university-NGO structured, formal partnerships for NGOs such as the National Association of Girls and Women in Sport (with the University of North Carolina, Greensboro), Women’s Sports Foundation (with the University of Michigan) and the International Working Group on Women (with Anita White Foundation). Will these partnerships significantly affect the quality and quantity of research on women in sport? Will these TYPES OF partnerships proliferate or disappear in the future?

Carole Oglesby

Conducting Exercise Physiology Research
Female athletes may show differences in the rate of adaptation to training stimuli and be susceptible to different injuries and recovery rates to that of men as a result of the differences in their respective physiological profiles (e.g., hormonal responses, body composition, anatomical structure). Although growing, research targeting training programs to optimize athletic performance and decrease injury risk in female athletes is lacking. This segment will discuss the current literature on physiological demands of sports performance in female athletes, identify areas suggested for future research in this area, and suggest strategies for building collaborative enterprises that facilitate service and research opportunities (including logistical considerations for testing and data collection).

Katie Sell

Conducting Health-Related Research
Dr. Ransdell will discuss past, present, and future trends relative to studying health-related aspects of sport participation in elite female athletes. In addition, she will discuss strategies for conducting research with this population. Her talk will finish with information about a new NAGWS grant designed to encourage more scholars to study the female athlete.

Lynda B. Ransdell
Technological Advancements in Warfare and Medicine: Resulting Injuries and the Role of Adapted Physical Activity, Sport and Recreation

Due to technological advancements in military combat equipment, service men and women are sustaining injuries not only from gunshot wounds, but also road side bombs (IEDs), mortar attacks, and rocket propelled grenades. Conflicts involving such weapons are leaving military personnel with serious injuries including amputation, spinal cord injury, traumatic brain injury, visual impairment, severe burns, and permanent disfigurement. Another serious issue now recognized is post-traumatic stress disorder. With improved medical technology and response on the field many who would have died in the past are now surviving. Following such injury, many of these men and women, whether engaged in short-term military service or with intentions of making the military their career, are left feeling discouraged, depressed, and hopeless. Family members struggle to deal with the “new” member of their family who has returned home often angry, confused, distant, and withdrawn. With any severe injury, and the extensive surgery, rehabilitation, and therapy that follow, comes frustration and thoughts of “where do I belong” now that I am living with a disability. The role of community based sport and recreation programming for regaining hope and engaging in life following injury will be discussed. Examples from a successful community program provider will be given along with discussion of an ongoing research study.

Laurie A. Malone, Mandy Goff, & Laura E. Dreer

Inclusive Physical Education/Activity – What Can Be Done to Increase the Participation of Individuals with a Disability?

This contribution will draw the picture of inclusion as it appears in Austria by highlighting a few examples from research and practice. There are “models of inclusive education” in use which work for physical education (PE) more or less well. We can find a spectrum of a more or less hindering or supporting environment and a frame work from full inclusive settings through part time inclusion up (or down) to segregated classes and schools. Some recent findings about opinions and attitudes of PE teachers and how they see the participation of their students with a disability done in secondary schools of the most eastern province of Austria, Burgenland, will be reported. The quantitative analyze of the collected data wanted to find out the amount of those students included in regular PE and whether they do not only attend class, but actively participate in shared activities with others. Furthermore, some examples of inclusive awareness programs – realized in Israel and Austria – present activities where inclusion is offered to link the both sides of ability and disability and is seen as a prerequisite for peace and social understanding.

Maria Dinold

Inclusion of Students with Disabilities in Sport Science Universities: Adaptations and Professional Perspectives

What adaptations are provided to ensure that university students with disabilities are given equal opportunity and career options in the field of sport science? In order to address this particularly complex issue, as the concepts of disability and inclusion are still problematic in higher education, we highlight the obstacles encountered by students with disabilities while studying in the field of sport science. We also list the various adjustments implemented in diverse universities throughout their studies and in particular highlight the strategies implemented to include them into the sport practices or the ones used to exclude them. We analyze the university curriculum of students with disabilities in France from 2008 to 2012. The techniques used in this study are based on the methodology known as "life story" or "life history". This refers to a plurality of practices falling within different fields of social practices. Students with and without disabilities and professionals from several universities completed questionnaires and interviews. What emerges from the first written and oral data is the diversity of adaptations from one university to another. These variations depend on several factors such as the type and severity of the disability, the attitudes and knowledge of professionals and staff, and the objectives of the students...
in term of career. Another aspect noticed was that sport science universities providing curricula in Adapted Physical Activity (APA) with teachers specialized in this area are not significantly better including students than the other ones. This study shows that even in a space that could be considered as inclusive due to the existence of APA professionals, sport science studies, like many other disciplines does not completely respond to the issue of inclusion in higher education. We propose a strategic plan and practical recommendations to improve the quality of inclusion of students with disabilities in sport science curricula, their orientation, and professionalization. Claire Boursier, Didier Séguillon, & Eric Marchetti

Adapted Physical Activity: A Vision from the ‘Inside’
This paper draws upon a moment in the life of an impaired sportsman in hopes of shedding light on the unintended consequences of actions taken by those in rehabilitation contexts which are part and parcel of the adapted physical activity (APA) business. Using an ethnographic vignette the author will explore the power involved in medicine and how decisions made by those in the field could possibly have a detrimental impact upon quality of life of people with impairments. A lens that combined elements of both Bourdieu and Foucault will be used to unpack the potential pitfalls that may exist in the field of APA where expert knowledge has all too often resided with the ‘able’ practitioner. Our field is failing its clientele by paying lip service to customer’s needs as it is seldom that programmes are designed by consumers. Rather they are built for them. It is hoped that this paper, which draws upon a ‘what if moment’, will entice both scholars and practitioners in the field of APA to do more to ensure that impaired populations are really at the heart of what we do as professionals. P. David Howe
Rethinking the Traditional Heat Acclimation Strategy for Olympic and Paralympic Athletes
Maxwell, NS*; Garrett, AT; Castle, PC; Taylor, L
1University of Brighton, United Kingdom; 2Universities of Hull & Otago, United Kingdom; 3GlaxoSmithKline, United Kingdom; 4University of Bedfordshire, United Kingdom

Symposium Introduction
Previous Olympic and Paralympic Games have been held in hot, humid conditions that challenge athletes’ ability to thermoregulate and can diminish exercise performance. Heat Acclimation (HA) strategies that use low exercise intensities, of a prolonged, continuous duration and for 10-14 days have traditionally been adopted to prepare athletes for exercise in the heat. While the expected heat stress at the London 2012 Olympic and Paralympic Games may be moderate (~ 21°C/69%rh), recent work by Lorenzo et al., 2010; Journal of Applied Physiology, 109, 1140-1147 and within our own laboratories has demonstrated HA can be beneficial for exercise performance in temperate conditions. Through new evidence however, this symposium will lead the audience to reconsider the traditional ‘one-size-fits-all’ approach when using HA to optimise exercise performance. The merits of short term HA on adaptations and exercise performance will be discussed. The primary stimuli for HA is thought to be a sustained elevation in core temperature of 1-2°C. In practice, traditional HA protocols that apply constant heat stress and exercise intensity over a number of days to elicit adaptations, observe a progressive decline in heat strain over the course of the acclimation period, such that exercise performance in the heat may not be maximized. As part of the introduction to this symposium, data will be presented that compared a progressive HA protocol with a traditional protocol, matched for heat stress on markers of heat adaptation and intermittent sprint exercise in the heat. An important feature of this symposium through the series of scientific presentations, will be to consider the efficacy of variations of the traditional, constant work-rate method and present data that supports the controlled hyperthermia HA technique to achieve a more complete adaptation. Adaptations to HA at a cellular level will also be considered in this symposium.

Neil Maxwell

Effectiveness of Dehydration on Adaptation to Heat
This work examined the effectiveness of short-term (5 day) heat acclimation (STHA) with moderately and highly trained athletes; fluid regulatory strain has a thermally-independent role in heat adaptation; and, the impact of STHA on a marker of thermotolerance (inducible heat shock protein 70; HSP70). Ten moderately trained males completed heat acclimation (HA) under controlled hyperthermia (rectal temperature 38.5°C) for 90-min on five consecutive days (Ta = 40°C, 60% RH), on two occasions separated by a five-week washout, in a cross-over design. One HA was undertaken with euhydration (fluid replenishment; EUH) and one with dehydration (no fluid intake; DEH) during daily HA bouts. Participants completed an exercising heat stress test (HST) one week before, then on the 2nd day after HA for both regimes. HST involved cycling at 40% PPO for 90 min (Ta = 35°C, 60% RH), 10 min rest and a ramp protocol (2% PPO every 30 s) to volitional fatigue. On a later occasion eight highly trained male rowers were acclimated under the same protocol but with dehydration (no fluid intake; DEH) during daily HA bouts. Participants completed an exercising heat stress test (HST) one week before, then on the 2nd day after HA for both regimes. HST involved cycling at 40% PPO for 90 min (Ta = 35°C, 60% RH), 10 min rest and a ramp protocol (2% PPO every 30 s) to volitional fatigue. On a later occasion eight highly trained male rowers were acclimated under the same protocol but with DEH acclimation only and a rowing-specific HST (2000m rowing performance test). Short-term HA resulted in physiological adaptation and enhanced exercise capacity for moderately trained participants. Compared to EUH permissive DEH during HA bouts conferred larger acclimation-induced increases in resting PV by 4.1% (95%CI: -1.5 to 9.8%; p=0.06), (4.2: 0.7 to 7.8 ml.min⁻¹.100 ml⁻¹; p=0.009), FVC (0.06: 0.02 to 0.10 ml.100ml Tissue⁻¹.min⁻¹.mmHg⁻1; p=0.006), end-exercise (45.9: 3.6 to 84.4 mL; p=0.02) and decreased end-exercise by 17% (19: -29 to 9 b•min⁻¹; p=0.08). The highly trained athletes had functional heat
adaptations of similar magnitude of moderately-trained across DEH acclimation, resting PV expansion (4.5: 0.7 to 8.3%) and increased performance (-4.0: -6.3 to 0.6 s; p=0.02). Plasma total protein-corrected HSP70 increased from rest to end-exercise across acclimation (p=0.001). There was a greater change from rest to end-exercise on day one versus day five HA (p=0.05). In conclusion, short-term (5 day) heat acclimation was effective with adaptations more pronounced after fluid regulatory strain from a dehydration acclimation regime. Similar findings were found using highly trained and lesser-fitness adapted participants. Thermotolerance was increased by dehydration acclimation.

Andrew Garrett

Partial Heat Acclimation of Athletes with Spinal Cord Lesion

Heat acclimation (HA) can improve thermoregulatory stability in able-bodied athletes in part by an enhanced sweat response. Athletes with spinal cord lesion are unable to sweat below the lesion and it is unknown if they can HA. Five Paralympic shooting athletes with spinal cord lesion completed seven consecutive days HA in hot conditions (33.4 ± 0.6 ºC, 64.8 ± 3.7 %rh) using the thermal clamp method. Aural temperature (Taur) was recorded throughout. Body mass was assessed before and after each session and a sweat collection swab was fixed to T12 of the spine. Fingertip whole blood was sampled at rest on days 1 and 7 for estimation of the change in plasma volume. Resting Taur declined from 36.3 ± 0.2 ºC on day 1 to 36.0 ± 0.2 ºC by day 6 (P < 0.05). During the HA sessions mean Taur declined from 37.2 ± 0.2 ºC on Day 1, to 36.7 ± 0.3 ºC on Day 7 (P < 0.05). Plasma volume increased from day 1 by 1.5 ± 0.6% on day 7 (P < 0.05). No sweat secretion was detected, or changes in body mass observed, from any participant. Despite the limited evaporative heat loss of these athletes partial heat acclimation was achieved.

Paul Castle

An Alternative Method of Short term Heat Acclimation

A period of heat acclimation (HA) reduces the decrement in athletic endurance performance in the heat (Castle et al., 2011; Journal of Sports Sciences 29, 1125-1134). However, the required proximity of HA to competition may compromise training frequency and intensity, cause logistical issues and disrupt tapering for competition. Data from our research group has shown that exertional heat stress (EHS) and exercise induced muscle damage increases rectal temperature (Tre) and Hsp72 and Hsp90α mRNA relative expression in excess of EHS alone (Tuttle et al, 2012; manuscript in preparation). These combined stressors (intervention: 30 mins downhill running (-10%) in 30°C, 50%RH) may convey a form of “crash” HA. Participants completed two bouts (EXB1 & EXB2) of the intervention separated by 1 week to assess the interventions effectiveness with regards to reducing physiological strain and the cellular stress response. The intervention reduced peak rectal temperature in EXB2 by 0.3°C (39.3 ± 0.3°C to 39.0 ± 0.3°C; P = 0.016) and average HR by 5 BPM (154 ± 3 BPM to 149 ± 2 BPM; P = 0.038), compared to EXB1. This reduced physiological strain is comparable to that of short term HA, as shown elsewhere. Further, Hsp72 and Hsp90α mRNA relative expression was attenuated post EXB2 in both leukocytes and vastus lateralis, compared to EXB1, indicating a reduced stress response at a molecular level. Consequently this intervention may be used as an alternative method of partial HA (evidence from both whole body and molecular physiology) in line with recently proposed short term HA models (Garrett et al., 2009; European Journal of Applied Physiology 107, 659-670; Garrett et al., 2012; European Journal of Applied Physiology 112: 1827–1837).

Lee Taylor

Symposium Conclusions and Discussion

The symposium will conclude by outlining the limitations of using traditional heat acclimation methods to optimise exercise performance, discuss alternative approaches and suggest future directions for research. During this time, there will be an opportunity for questions to be asked and the sharing of good practice.
Creating a Legacy of Organisational Learning in Elite Sport – Maximising the Delivery of Technical Skills

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1HPM, United Kingdom; 2Wharton Consulting, United Kingdom; 3English Institute of Sport, United Kingdom

Many of those excelling in elite sport naturally seek a competitive edge within the technical coaching and sports science & medicine domains. It is also true that under the intense challenges of elite sport, some sports scientists; sports medics and coaches thrive and deliver outstanding support, whilst others with equal talent and technical prowess falter and under-perform. The difference between the two is often laid at the door of ‘soft’ or generic skills, as though these skills were a separate discipline. In reality, technical skills and generic skills are two sides of the same coin: they together and only together deliver the excellence that remains beyond reach if the two were dissociated. Generic skills are best viewed as the scaffolding that supports, indeed enhances the delivery of technical skills. The truth is that for many technical people, these generic or soft skills can be hard to master. The people that do master these generic skills set the standard for the delivery of excellent technical skills. The research literature provides further understanding of the potential offered by integrating technical and generic skills. Studies that have examined Olympic performance factors reveal perhaps an increasing level of credence that is attributed to generic skills by both athletes and coaches. Gould et al. (2002) found that high-ranking performance factors among athletes included positive relationships and leadership effectiveness across the whole team, including support staff. A similar study among UK track athletes by Mckay et al. (2008) broadly supported these findings, noting the importance of positive interpersonal relationships across the wider team, again including support staff. There is an increasing line of evidence that in the accelerating global arms race of elite sport (Oakley & Green, 2001), the contribution of generic skills provides a natural resource of competitive advantage that has yet to be fully mined.

References


Anticipation Skill in Olympic Sports: Advances in Theory and Practice

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Current and Future Challenges for Anticipation Skill Researchers and Practitioners

There is a large amount of research activity into anticipation skill. If the proposed benefits of this activity are to have translational impact in elite sport, then significant theoretical and applied challenges need to be overcome. These challenges will be highlighted in this first talk of the symposium and attempts to overcome them will be explored in the subsequent talks. Finally, the symposium will be concluded with a discussion around the future challenges for applied practitioners wishing to develop anticipation skill in Olympic athletes and the need for collaboration between researchers and practitioners in facing up to these challenges.

A. Mark Williams

The Good, the Bad and the Downright Dirty of Anticipation

Research findings highlight that expert performers have greater anticipation skill compared to novices. One explanation may be that through practice experts have amassed significantly more associations between movement actions and their effects and are thus better able to predict movement outcome. However, this predictive action-effect behaviour may not always serve to enhance performance (i.e., when observed actions are
deceptive in nature and designed to create unwanted or incorrect movements). Recent data will be presented that
used a representational momentum paradigm to investigate expert-novice differences in the anticipation of
observed actions. Specifically, it explores whether differences occur when the outcome of the observed action is
either expected or unexpected based on prior experience. The discussion of the findings will focus of two areas; 1)
whether the action-effect principle is a possible explanation for perceptual anticipatory differences between
experts and novices; 2) the implications the findings have within faking and deception in sport.
Gavin P. Lawrence

Anticipation skill: A Deceptively Simple Story?
Judging the intentions of your opponent is central to attaining high levels of performance in many sports; indeed,
superior skill in using early visual information is widely recognised as a hallmark of expertise. In this presentation, I
argue that a full understanding of expert anticipation skill must include systematic research into how performers
discriminate between 'genuine' and deceptive visual information. I will discuss recent research in this area by
focusing on two questions. First, what is the evidence for an expert advantage in discriminating between genuine
and deceptive movement? Second, what are the contributions of 'top-down' and 'bottom-up' processes when
making judgments about deceptive motion? In discussing these questions, I will consider possible implications of
this research for the development of effective perceptual training protocols.
Robin C. Jackson

Training Anticipation Skill
Experimentally strong research designs have generally shown pre to posttest improvements in anticipation
performance. This has led researchers to increasingly address questions of how to train anticipation skill. This
presentation will review some of this recent experimental evidence. In particular, the focus will be on; the relative
effects of various instructional approaches; the potential importance of executing a game-specific movement on
perception; and using a stimulus modification approach to improve advance cue utilisation. The importance of
these experimental findings to practitioners will be discussed. Alongside this, methods to maximise anticipation
skill learning in an applied setting will be suggested.
Nicholas J. Smeeton

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Prosthetic Technology and Athletic Enhancement: Blurring the Human/Non-human Divide and What It Means for
Elite Sport.
Ryall, EST* 1; Culbertson, L* 2; Thomen, C* 3
1University of Gloucestershire, United Kingdom; 2Edge Hill University, United Kingdom; 3Victoria University,
Australia

This panel will discuss issues relating to projected advancements in technology and its effect upon sport.
Developments in material and neurological technology, whereby synthetic technologies are integrated with
biological ones, means the prospect of ‘cyborg’ athletes may become a reality within the next few decades. This
will pose both conceptual and ethical questions about the nature of elite sport; for if modern sport is premised
upon the notion of assessing and measuring ‘natural’ talent, then judgements and distinctions need to be made on
what is and is not ‘natural’ as the boundaries between human and non-human (as commonly conceived) appear to
become increasingly blurred.
These types of conceptual questions have already started to be seen in recent years, most notably with the
dissension between the South African athlete Oscar Pistorious and the IAAF. The disagreement centred on
whether Pistorious’s prosthetic limbs gave him an unfair advantage over other ‘non-prosthesised’ athletes.
Although tests were generated to assess whether his prosthetic limbs functioned in an unacceptably non-natural
way, any judgement is necessarily based on a presupposed norm of human functioning and an implicit
conceptualisation of humanness.
It may also be proposed that developments in this type of enhancement technology will render linear, competitive,
elite sporting activities (such as those exemplified in track and field athletics) meaningless since they too are
premised upon the notion of a ‘natural’ ‘human’ athlete. Part of these problematic issues can be seen in FINA’s recent re-evaluation of accepted swimwear after forty-three world records were broken at a single event in Rome 2009. In this instance, the swimming costumes worn by the athletes were not an embedded part of their bodies and so the regulations could be altered fairly straightforwardly. However when technology, such as the prosthetic technology used by athletes in (dis)ability sports, are integrated and fused into the nervous and neurological systems (as currently being developed by scientists such as those at Georgia Institute of Technology and North-Western University), it will become ever more difficult for sporting authorities and Governing bodies to regulate what constitutes unfair, enhanced performance in sport.

Such problems will be further accentuated due to the fact that sport is contained within a broader world where advancements in biological and material technology will be made regardless of any intention of sporting authorities to limit its effects. The conceptual distinction between therapy and enhancement will come to the fore in all sporting competitions as it will become more commonplace for individual athletes to replace ailing and injured tissue, tendon, cartilage and bone with the more effective inorganic substitutes. This is already becoming the norm with the replacement of elbow tendons, knee cartilage, ligaments and athletes undergoing eye surgery. And when the decision to utilise such technology is not one based on the enhancement of sporting performance but rather medical judgement about quality of life, sport may find that its powers to legislate over what is and isn’t constituted by the rules diminished.

This panel therefore will consider the issues of enhancement technology, the nature and value of elite sporting competition, questions regarding fairness and natural ability, and the concepts of human-ness and the natural and un-natural in relation to athletes.

Socio-Economic Determinants of Olympic and Paralympic Success
De Bosscher, V*; Wong, J*; Smith, A*

Factors for Olympic Success
Competition in elite sport is intensifying because the demand of nations for (particularly Olympic) success is increasing where the supply of medals remains relatively fixed. As a result of the ‘global sporting arms race’ more nations are investing strategically in elite sport and nations are searching for the optimal mix of policy measures to gain a competitive advantage in elite sport (Oakley & Green, 2001; De Bosscher et al., 2008). An international group of researchers has joined forces to develop theories, methods and practice regarding Sports Policy factors Leading to International Sporting Success (SPLISS). This paper deals with the strategic thinking that underpins a large-scale international comparative SPLISS-study (2011-2012), involving 15 countries. The conceptual model that underpins the SPLISS study is based on nine pillars, or policy dimensions that are identified as important areas of investment. These pillars were operationalised by 126 critical success factors (De Bosscher et al., 2006 & 2009). 15 countries are involved in this study: 10 European nations (Belgium (FLA + WAL), Denmark, Estonia, Finland, France, The Netherlands, Northern Ireland, Portugal, Spain, Switzerland); 1 nation in Oceania (Australia); 2 in the Americas (Brazil, Canada); and 2 in Asia (Japan & Singapore). Data are collected through an overall sport policy inventory and a survey completed by (a) athletes, (b) coaches and (c) performance directors as important stakeholders in elite sport in each nation. As data collection is not yet completed we are not in the position yet to provide an insight into results. Of course this will be possible at the time of the conference.

Veerle De Bosscher

Factors for Paralympic Success
With competition and participation continuing to increase in Paralympic sport, this study explores team composition variables as predictors of Paralympic success. Using data from the 2008 Paralympic Games, countries were categorized by population and wealth to highlight trends in team size, number of sports/team sports and type of sports of medal winning and non-medal winning countries. Although findings confirmed team size as the strongest predictor of Paralympic success, further analysis drew findings strategically useful to countries unable to
support large teams due to limited finances and/or small populations. Notable findings were that low-income countries were able to activate success through participation in a small number of sports with multi-medal potential, there was a wealth/population threshold which allowed countries compete in team sports and that government commitment and financial investment were critical to success. It is hoped that these findings will be a useful starting point for strategic Paralympic development and lead to further research surrounding disability sport policy.

Jennifer Wong

Money vs. Athlete Development in Olympic and Paralympic Sport

The emergence of state-sponsored, elite sport development (ESD) systems has become an increasingly prominent feature of sport policy in many countries throughout the world. In view of the increasing globalization and social and cultural significance of modern achievement sport, since the 1960s many governments have sought to invest in promoting international sporting success, particularly in Olympic, and to a lesser extent, Paralympic, sports. Among other things, this has involved an increasingly professionalized approach to sports coaching, the development of more systematic approaches to talent identification and development (TID), and a parallel emphasis on the use of sports science support to maximize athletic performance. For many athletes these broader processes have involved ‘a trend towards initiating serious, systematic training at earlier and earlier ages ... [and] increased specialization at younger and younger ages’ (Beamish and Ritchie, 2006: 27). The objective of this presentation is to reflect upon some of the tensions that exist between the promotion of athlete performance and the broader commercial pressures associated with the growth of Olympic and Paralympic sport. In doing so, it will be argued that the constraints generated within the growing commercialization, politicization and de-amateurization of sport (Waddington and Smith, 2009) limits the extent to which athlete welfare and development can be prioritized alongside the growth of global sporting competitions such as the Olympic and Paralympic games.

Andy Smith

Tensiomiography Measurement and Application within High Performance Sport

The reliability and validity of tensiomiography (TMG) as a muscle analysis tool within high performance sport has been established over several years by both basic and applied research studies. This symposium will initially review the reliability and validity of targeted TMG measures across muscle fibre typing, muscle fatigue and muscle balance (symmetry) assessment. This review will underpin the second presentation area where the application of TMG within high performance sport will be closely considered via case studies from soccer, basketball and judo. In particular, the case studies will follow a longitudinal theme whereby the interpretation of TMG measures will be emphasised relative to periodised programming and coaching decisions. The interface of TMG measurement and high performance coaching processes will be considered relative to the simplicity of TMG measurement and to the proximity of TMG feedback to decision making input from medical, strength and conditioning and coaching staff. Finally, the symposium will table key factors that further increase the credibility and viability of TMG measurement within high performance sport environments. These factors include the focus and speed of TMG data capture and the application of TMG within testing and monitoring conditions.

Angus Hunter and Jose Fernandez
Multi-Disciplinary Support of Elite Athletes - A National Model
Ingham, S*; van Someren, KA*
English Institute of Sport, United Kingdom

The English Institute of Sport (EIS) works in partnership with sports to improve performances through the delivery of high quality sport science and medical support to elite athletes, through its nationwide network of expertise and facilities. The EIS delivers 400 hours of support each week to approximately 1700 athletes from Olympic and Paralympic summer and winter sports, as well as a number of English and professional sports. In order to stay at the forefront of international competition, the EIS aims to provide highly integrated, quality-assured services and the development of world leading experts who are driving innovation and sharing knowledge to positively impact sporting performance. This symposium will outline the multidisciplinary philosophy and approach taken by the EIS to supporting elite athletes. It will provide specific examples to illustrate this approach in areas including athlete development and welfare, optimisation of training techniques, and preparation for competition.
To build a lasting legacy of sporting achievements on the world stage, the development of a sustainable network of sport science and medical expertise and world class facilities is vital to the sporting high performance system. The EIS is committed to not only developing our own experts, but also influencing change and informing best practice beyond the high performance system through representation on various advisory panels across science, medicine, exercise and health.
History has shown many instances where significant events have stimulated innovation resulting in stepwise changes in knowledge and understanding. The London Olympic and Paralympic Games have provided the platform for the increased investment of time, commitment and financial resource that has seen significant developments in the knowledge and practice of sport science and medicine – these range from those of a technical nature to the way in which sport science and medicine professionals are trained has evolved.
This symposium will highlight how the EIS has collaborated with partners on major projects to provide sports with the very best service through innovation; in addition, examples of where such innovation and development in sport science and medicine has provided a legacy for wider populations in society.
Ken van Someren and Steve Ingham

Developing Children into Champions
Williams, CA*; Lloyd, RS*; Haff, GG*; Hume, PA*
1University of Exeter, United Kingdom; 2University of Gloucestershire, United Kingdom; 3Edith Cowan University, Australia; 4Auckland University of Technology, New Zealand

Developing Children into Champions
The process of developing future sporting champions begins in childhood when those who are thought to be talented are identified and exposed to training regimes and stimuli believed to maximise their development. This symposium will bring together an esteemed collection of international scientists and practitioners to consider key factors of youth athletic development; covering scientific principles, current evidence and applied methodologies. Chair Dr Jeremy Moody

Long-term Athlete Development
Prof Craig Williams will explore the evolution of talent development models across a multi-disciplinary perspective, highlighting the merits and limitations of those models most popularly referred to and implemented in the sport and education setting. Appraisal of existing models will identify the need for a greater empirical evidence base and continued evolution of how athletic ability is developed in childhood.
Craig Williams
Youth Physical Development
Dr Rhodri Lloyd will present information on the newly constructed Youth Physical Development model and the role that strength and conditioning can play in maximising physical development from a young age through to early adulthood. This presentation will also provide practical guidelines and dispel some of the myths often associated with certain aspects of strength and conditioning, such as weightlifting and plyometric training, during childhood. Rhodri Lloyd

Youth Periodisation
Dr Greg Haff will address the complex issue of periodisation, a process often directly or indirectly ignored in youth training programmes. This presentation will demonstrate that growth and maturation, training stimuli and adaptation and developmental goals should all be carefully considered within the periodisation of a long-term development programme. Greg Haff

Youth Injury Occurrence and Prevention
Prof Patria Hume will close the session by discussing the interaction of growth, maturation and training on the occurrence and aetiology of overuse injuries in youth athletes, together with multi-faceted prevention strategies to help protect the developing athlete. Patria Hume

Different Perspectives on the Brain Regulation of Endurance Performance
Marcora, SM*; Nybo, L*; Marino, FE*; Millet, GY*
1University of Kent, United Kingdom; 2University of Copenhagen, Denmark; 3Charles Sturt University, Australia; 4Université de Lyon, France

The Psychobiological Model
The psychobiological model is a model of endurance performance based on three main principles:
A) Endurance performance is a voluntary behaviour, not a task directly limited/regulated by neuromuscular or energetic failure, neural reflexes, or subconscious central governors;
B) Voluntary behaviours, including endurance performance, can be explained using psychological constructs and theories (psychological level of explanation);
C) Our mind is ultimately generated by neuron activity in the brain, and it can be affected by physiological factors (biological level of explanation).

According to this psychobiological approach, the only factors directly limiting/regulating endurance performance are psychological (e.g., perception of effort and potential motivation); physiological factors affect endurance performance only indirectly by affecting psychological factors. During the symposium, we will discuss motivational intensity theory, review experimental evidence in favour of this model of endurance performance, and present recent studies on the neural correlates of perception of effort.
Samuele Marcora

Central Fatigue
Evidence from experiments with superimposed electrical stimulation during maximal voluntary contractions clearly demonstrate the presence of central fatigue; defined as an inability to maintain maximal central nervous drive to the skeletal muscles during brief and prolonged efforts. Studies with hyperthermia, severe hypoxia and hypoglycaemia furthermore illustrate that prolonged exercise may provoke cerebral perturbation and subsequently aggravate central fatigue. During maximal static contractions and sprinting this will deteriorate the ability to maintain force or power output, whereas during prolonged dynamic exercise with constant power output fatigue will emerge as increased difficulty to maintain the dictated pace. However, fatigue is not a single parameter issue and during competitions such as time trials or other exercise modalities where intensity and hence speed may be continuously changed, fatigue and performance will be influenced by the complex interplay of central and
peripheral factors. A model describing the “cerebral regulation of exercise performance” therefore should include all the components of importance for fatigue including factors that will affect the athletes pacing strategy. This presentation will provide such a model with focus on the influence of central fatigue that may arise secondary to neurobiological changes provoked by prolonged exercise.

Lars Nybo

The Central Governor Model
As originally proposed the Central Governor Model (CGM) was an attempt to explain the paradoxical observation related to the maximum oxygen consumption (VO2max) plateau and the capacity of the heart to deliver the required blood supply to working muscle. This aspect of the CGM has been extensively debated. Since this original proposition the CGM has been used as an alternative explanation for understanding the regulation rather than the limits of human exercise performance. In its simplest form the CGM predicts that the amount of skeletal muscle that the brain chooses to recruit or activate will always be regulated to ensure that the organs of the body are protected during exercise; thus exercise is brain-regulated behaviour, the primary purpose being survival and never an absolute maximum effort. The theory proposes i) physical activity is controlled by a central governor in the brain; ii) multiple organ systems function as a complex system during exercise; iii) no single physiological system is ever used to its maximum capacity; iv) the CG aims to ensure that exercise terminates while or bodily systems remain in homoeostasis and in normal functional range. The end result of such a system is the ability to anticipate the requirement of the exercise bout. Thus, a model that accommodates anticipatory regulation must by definition coordinate responses subconsciously. We understand this process in athletic performance as pacing. It follows that an athlete develops a pacing strategy either before or very early during the exercise bout. The CGM might not be the final explanation but a feedforward mechanism might potentially advance our understanding of human performance. As the classical theory has undergone very little modification since its inception in the 1920s, is it possible that the constraints of this theory are contributing to limiting our understanding of fatigue?

Frank Marino

The Flush Model
In the ability to run marathon and ultra-marathon, fatigue resistance is critical. Fatigue is generally defined as strength (or maximal power) loss. To investigate neuromuscular fatigue, evaluation requires measurements of maximal voluntary contractions and maximal electrical/magnetic stimulations. These measurements provide an insight into the factors in the central nervous system and the muscles implicated in fatigue. However, such testing do not necessarily predict how muscle function may influence prolonged running performance and whether this has an effect on speed regulation during a real competition, i.e. when pacing strategies are involved. In other words, the nature of the relationship between fatigue as measured using maximal contractions/stimulation and submaximal performance limitation/regulation is questionable. To investigate this issue, we are suggesting a holistic model that can be applied to all endurance activities, but is specifically adapted to ultra-endurance running: the flush model. This model has four components: (i) the ball cock (or buoy) which can be compared to the rate of perceived exertion and can increase or decrease based on (ii) the filling rate and (iii) the water evacuated through the waste pipe, and (iv) a security reserve that allows the subject to prevent physiological damage. We are arguing that central regulation is not only based on afferent signals arising from the muscles and peripheral organs but is also dependent on peripheral fatigue and spinal/supraspinal inhibition (or disfacilitation) since these alterations imply a higher central drive for a given power output. This holistic model also explains how environmental conditions, sleep deprivation/mental fatigue, pain-killers or psycho stimulants, cognitive or nutritional strategies may affect ultra-running performance.

Guillaume Millet

Science in Optimizing Elite Performances in Sport
Müller, E*1; Keskinen, KL*2; Stretch, R*3
1University of Salzburg, Austria; 2Finnish Society of Sport Sciences, Finland; 3Nelson Mandela Metropilitan University, South Africa
Science in optimizing elite performances in Skiing, Swimming and Cricket

Multiple factors determine performances in elite sport. Sports discipline itself is the basic determinant setting limits to the activities practiced by the actors. The athletes develop their physical characteristics to meet with the requirements set by both the sport discipline and their counterparts. This Symposium highlights factors that determine elite performance in three sports disciplines: skiing, swimming and cricket. Each has their own peculiarities, even though many characteristics are in common. Scientific knowledge in the area of e.g. biomechanics, exercise physiology and medicine is accumulating rapidly. World Commission of Science and Sport wish to bridge the gap between theory and practice by providing updated information on latest research in the field.

Erich Müller, Kari L. Keskinen, Richard Stretch

Contemporary Issues in Recovery

Howatson, G*; Gregson, W*; Morton, JP*; Cook, CJ*

1Northumbria University, United Kingdom; 2Liverpool John Moores University, United Kingdom; 3UK Sport, United Kingdom

Contemporary Recovery Strategies; what’s the Evidence?

During and following strenuous physical activity disturbances in homeostasis can result from the metabolic stress, mechanical stress (such damaging eccentric biased contractions), or indeed a combination of the two. Regardless of the exercise stimulus, it seems likely that both inflammation and oxidative stress are in some way implicated. The biggest challenges that athletes and practitioners must overcome following strenuous exercise are the subsequent performance decrements and residual muscle soreness that can persist for several days following the exercise insult. Typically these include reduced muscle function, such as the ability to produce force, reductions in joint position sense and reaction time and muscle soreness. These factors are important for several reasons because it can impede the ability to perform at a high intensity in subsequent training bouts and/or competitions and it heightens the risk of potential injury. As a consequence, researchers and practitioners have examined a plethora of potential recovery strategies applied as a prophylactic or therapeutic intervention to manage inflammation and oxidative stress and hence the negative effects associated with strenuous exercise. In this presentation an overview of the problems associated with strenuous exercise is presented and a selection of contemporary but topical prophylactic and therapeutic recovery interventions are discussed.

Glyn Howatson

Cold Water Immersion in the Post-exercise Period: Implications for Recovery and Adaptation

Cold water immersion (CWI) is frequently applied following exercise in an attempt to alleviate some of the physiological and functional deficits associated with exercise-induced muscle damage and therefore subsequently enhance the athlete’s recovery. Despite its widespread adoption, CWI remains controversial due, in part, to the lack of physiological data regarding underlying mechanisms. Some of the effects of cryotherapy have traditionally been thought may be mediated through reductions in micro-vascular blood flow to the injured muscle, which in turn reduces both oedema and the induction of inflammatory events. Whole limb CWI is therefore thought to be effective by virtue of its impact upon deep muscle blood flow. This presentation reviews data from our laboratory and others which has recently examined the effects of CWI on muscle blood flow perfusion using contemporary techniques. The effects of these blood flow alterations on post-exercise muscle glycogen re-synthesis are also discussed. Contrary to its purported effect in enhancing skeletal muscle restoration, CWI has been hypothesised to attenuate specific skeletal muscle cell signalling pathways leading to reduced training adaptation. Recent work from our laboratory which has explored the influence of CWI on cell signalling pathways which mediate mitochondrial biogenesis is also discussed.

Warren Gregson

Nutrient-Gene Interactions: Promoting Recovery versus Training Adaptations?

From a nutritional perspective, traditional approaches to recovery have focused on ensuring appropriate
carbohydrate (CHO) availability (in terms of timing, type and quantity) so as to maximize post-exercise muscle glycogen re-synthesis and restore subsequent exercise capacity. Furthermore, addition of high quality protein is also essential to promote protein synthesis and skeletal muscle remodelling in the early recovery period. However, with recent advances in molecular biology, emerging evidence suggests that deliberately withholding CHO intake in the early post-exercise recovery period (such that muscle glycogen remains low prior to the next training session) enhances skeletal muscle cell signalling thereby leading to enhanced training-induced oxidative adaptations of skeletal muscle. In this regard, considerable debate now exists in relation to whether nutrient availability should be manipulated to promote recovery or training adaptations. This presentation reviews data from our laboratory and others and outlines novel cell signalling pathways by which reduced CHO availability may regulate mitochondrial biogenesis. Ultimately, the author discusses how periodised models of nutrition can be applied to simultaneously promote training adaptations and recovery where the Olympic sports of boxing and soccer serve as the sporting framework.

James P Morton

Recovery Adoption and Implementation: Practicalities of Sport

Recovery science has expanded our understanding of the processes that underlie this important aspect of competition and training, however ultimately there are practicalities that determine how much is adopted and implemented in sports. A factor of some importance is quantification of the impact of recovery modalities on actual measured performance. Often robust science is presented with logistic difficulties in the field to show quantifiable gain to either performance or training block outcomes and often these are complexly affected by recovery strategies. An example is the use of cool water immersion across multi competition in a short timeframe. A proportion of athletes clearly gain from this strategy while others show no effect or measurable detriment. We have found that this outcome depends on both heat capacity and heat gain across not only the competition but the warm-up as well. As both warm muscles prior and heat loss subsequent to competition are important variables the data shows that for successful implementation a deeper understanding of the holistic sporting environment is needed. Equally both coach and athlete belief in the effectiveness of any recovery modality is an essential factor not only in adoption but also ultimately in performance impact. We present data showing a modality that has clear, supposedly beneficial physiological effects, but producing a performance deficit due to poor belief in its efficacy. Adoption and implementation remain key challenges in the transference from lab to field.

Christian J Cook

Endurance Exercise: Is Muscle the Limiting Factor?

Ross, EZ*; George, K*; Shave, R*; Romer, L*

1University of Brighton, United Kingdom; 2Liverpool John Moores University, United Kingdom; 3University of Wales Institute Cardiff, United Kingdom; 4Brunel University, United Kingdom

Neuromuscular fatigue following endurance exercise

An exercise-induced decrease in maximal force production, or the inability to sustain further exercise at a required force, characterizes muscle fatigue. Processes that lead to muscle fatigue can occur at every level of the brain-muscle pathway, whenever a sustained or repeated contraction is performed. Following endurance exercise, knee extensor strength decreases by up to 30%, and this strength-loss can be attributed to 'peripheral' mechanisms acting at a muscular level, 'central' mechanisms affecting corticospinal excitability and 'supraspinal' mechanisms causing output from the motor cortex to become sub-optimal. Very recently, techniques to investigate mechanisms of fatigue following whole body exercise have become more sophisticated, allowing greater insight into the cause of fatigue. This presentation will explore these most recent findings, exploring concepts such as supraspinal fatigue (evidence from transcranial magnetic stimulation studies), afferent feedback from locomotor muscles during endurance exercise contributing to fatigue, and finally evidence of a 'chronic fatigue' induced by repeated bouts of endurance exercise.

Emma Ross
Cardiac muscle function and endurance exercise
Studying the effects of prolonged intense endurance exercise upon the heart is, in part, based upon the concern that such extreme levels of exercise may be deleterious to the heart. Recent studies suggest that cardiac function is impaired following prolonged endurance exercise in highly trained athletes. New techniques such as Tissue Doppler Imaging (TDI) can detect subtle functional changes at a regional level, and are more sensitive and accurate than standard echocardiography in the identification of alterations in cardiac function following prolonged exercise. This presentation will discuss cardiac muscle function, measured using a variety of techniques, including TDI, following acute bouts of prolonged exercise. In addition, recent data observed following repeated prolonged bouts of exercise will be discussed.
Keith George

Cardiac muscle damage following endurance exercise
The observation of blood-borne markers of cardiac damage following endurance exercise has led to the suggestion that prolonged exercise may induce some level of EICD (exercise-induced cardiac damage). This presentation will examine the now well-established evidence that Cardiac Troponin-T (cTnT) is released following acute and repeated bouts of endurance exercise, reflective of minor myocardial injury, and its clinical significance. Recent data reported using new biological assays, which allow more sensitive detection of cTnT, will be discussed and the link between functional decrements and the presence of markers of myocardial damage will be explored.
Rob Shave

Respiratory muscle function and endurance exercise
This presentation aims to discuss the controversial question of whether the respiratory demands of exercise contribute significantly toward exercise limitation, either directly through limitations of the respiratory muscle pump or indirectly through effects on limb blood flow and locomotor muscle fatigue. The concept of respiratory muscle fatigue during endurance exercise and the implications of this fatigue for exercise tolerance will be discussed. Finally, the presentation will address the potential mechanisms by which respiratory muscle fatigue could compromise exercise tolerance and whether it is possible to overcome this potential respiratory limitation.
Lee Romer

Benchmarking and Monitoring the Performance Influence of Skill Acquisition Interventions
Fairweather, M M*; Sanders, R*; Alcock, A*
1sportscotland Institute of Sport, United Kingdom; 2University of Edinburgh, United Kingdom

Benchmarking and Monitoring the Performance Influence of Skill Acquisition Interventions
In high performance sport measuring the retention and transfer effects of skill acquisition training activities relative to targeted competition performance requires a paradigm framework that clearly interfaces with the coaching process. Within this symposium we will explore several examples of applied skill acquisition support that effectively interfaces with the coaching process and concurrently meets the necessary skill acquisition, retention and transfer conditions to assess both learning and performance impact. Via several case studies we will highlight the importance of understanding critical coaching questions prior to designing both measurement and paradigm solutions that best fit the coaching process. This symposium will therefore examine practical principles underpinning skill acquisition, retention and transfer measurement relative to periodised coaching processes and programming conditions. The case studies tabled will explore and discuss longitudinal measurement conditions that have a primary aim in impacting upon targeted competition performance. Challenges faced when creating a longitudinal measurement environment within high performance sport where skill acquisition measures can provide valuable insight will also be addressed.
Ross Sanders, Alison Alcock and Malcolm Fairweather
Cardiovascular Responses to Exercise in the Child and Adolescent Athlete

Circulatory adaptations to endurance training are closely linked to improvements in maximal oxygen uptake (VO2max) and, by extension, to performance on endurance athletic events. By the traditional concept, a training-induced increase in maximal cardiac output reflects improvements in stroke volume, which, in turn, is a manifestation of left ventricular diastolic enlargement. By this model, the latter is a consequence of extra-cardiac factors such as augmented plasma volume and enhanced parasympathetic tone (sinus bradycardia). Some evidence in highly-trained adult endurance athletes has suggested, however, that increases in maximal cardiac output and stroke volume might reflect, instead, improvements in myocardial function. This discussion will address findings in adolescent athletes which indicate that myocardial function during exercise (as measured by Doppler echocardiographic techniques) in this age group is independent of aerobic fitness, and that greater values of VO2max in the athlete are an expression of larger ventricular size.

Thomas Rowland

Oxygen Uptake Kinetics in the Adolescent Athlete

Pulmonary oxygen uptake kinetics are typically utilised as a proxy for muscle oxygen consumption kinetics during the transition to and from exercise. Despite the fast fundamental oxygen uptake kinetics previously demonstrated in adolescents, our findings show that even in this population, trained individuals of both sexes express faster oxygen uptake kinetics than their untrained counterparts. Therefore, as in adult populations the determination of oxygen uptake kinetics has utility in assessing the effectiveness of interventions designed to augment the efficacy of the cardiovascular and metabolic response to exercise. However, whether, as in adult populations, a direct correlation exists in adolescents between the rate constant of oxygen uptake kinetics and the upper limit of steady state exercise (critical power) remains to be tested.

Simon Marwood

The Exercising Adolescents’ Respiratory System

The process of ventilating air into the lungs and then transporting oxygen into the circulating blood has long been thought of as ‘over engineered’ however more recently it has come to be accepted that inspiratory muscles can become fatigued and that there are some sample populations (adolescent female endurance athletes) who demonstrate arterial oxygen desaturation during exercise. In addition asthma (a respiratory disease common in children but less so in adults) appears to be increasing in prevalence across the globe and placing a large economic burden upon society. Exercise is pivotal to understanding asthma both as a trigger for bronchoconstriction (asthma attack) and as a method of non-pharmacological treatment for the condition. Differences in the adolescent respiratory system and the impact upon exercise performance, including the sex differences in asthma prevalence, arterial de-saturation during exercise and ventilatory limits to exercise performance will be discussed.

Martin R Lindley

Beyond Talent: Expert Athletic Performance and its Development

Expert athletic performance and its Acquisition

Sporting success relies on the expert performance of athletes and teams. The expert performances of elite athletes are underpinned by physical, psychological, and skill attributes. A number of factors are involved in the acquisition
of these attributes. In this presentation, the most up-to-date science is reviewed on the attributes of expert athletes, particularly those related to skill, and some of the factors involved in their acquisition. The review will show how skill consists of perceptual, cognitive and motor abilities that play a major role in expert athletic performance. It will show how practice, training, instruction and other activities can be optimised for athletes from childhood to adulthood in order for them to acquire skill and expert performance. Some of the other factors related to the development of expert performance in sport, such as an individual’s age relative to their peers, will also be outlined.

Paul. R. Ford

The Role of Deliberate Practice and Deliberate Reflection in the Skill Acquisition of Elite Athletes

Practice plays an important role in the acquisition and development of expert performance. Engagement in deliberate practice is thought to be how expert performers continue to improve their performance beyond its current level. Deliberate practice activity is planned and designed, relevant to improving performance, requires resources, requires effort, and may not be inherently enjoyable. In this presentation, a series of research studies are detailed examining the role of deliberate practice and a new concept, deliberate reflection, in the skill acquisition of expert and intermediate Gaelic footballers. One study examined whether expert players self-select to deliberate practice, experience its characteristics and improve their performance, all to a greater extent than intermediate players. Another study examined if expert players deliberately reflected on their practice and improved their performance, both to a greater extent than intermediate players. In a final study, one group of intermediate youth Gaelic footballers who experienced an intervention including deliberate practice and deliberate reflection were expected to improve performance to a greater extent than a control group. Findings are compared to deliberate practice theory and show how it may be applied to accelerate the development of skills in athletes.

Edward K. Coughlan, A. Mark Williams and P.R. Ford

Developing expert athletic performance

Since its inception in 2006, the UK Talent Team has applied science and innovation to the World Class Performance landscape impacting in a variety of ways on athletes’ development. Through ground breaking talent identification and transfer initiatives, including Girls4Gold and Fighting Chance, over 7,000 individuals from the Great British public have been assessed as part of various technical frontline solutions designed to identify athletes with elite sporting potential. As a result, over 50 athletes new to the high performance system are now on Olympic and Paralympic development programmes, working towards success in London 2012, Sochi 2014, Rio 2016, and beyond. The programmes have already produced 90 international medallists (at senior and junior level) including 15 World Championship, 7 European Championship, 27 World Cup medals. In this session, the team will examine a number of case studies from these initiatives, reviewing how science has been used to identify, confirm and develop talented athletes. The team will also discuss how they benchmark effectiveness, initiate research initiatives and undertake education programmes in order to continually enhance the understanding of talent identification, confirmation and development of athletes across the World Class Performance Pathway.

Chelsea R. Warr and Ian Yates

The Perceptual and Cognitive Foundations of Athletic Pacing

Pacing’s Inner Zombie: The forgotten role of the unconscious in the regulation of pacing and performance

Pacing is a type of homeostatic mechanism which ensures that the athlete reaches the endpoint of their chosen event in the fastest possible time but without catastrophic failure of any physiological system. Like all homeostatic mechanisms, pacing requires three basic functions, namely afferent information from sensors describing any potentially harmful environmental or internal changes, a decision making algorithm which decides whether alteration of pace is required based on this afferent signaling, and efferent output capability to enact any changes
in pace signaled as being required by the algorithm. One hundred years after Freud and his colleagues introduced
the concept of the unconscious to the discipline of Psychology, in Sport Science, perhaps due to the ubiquitous use
of the Borg RPE scale in most pacing research protocols, it is still widely believed that the decision making
algorithm occurs at a conscious level, and that athletes consciously decide how to pace themselves through their
chosen athletic event. In this presentation, we will examine recent research, and forgotten basic neuroscience
principles, to show that the body functions optimally when regulated by unconscious control mechanisms, and
that conscious thought processes may actually hinder, rather than optimize pacing and performance.
Alan St Clair Gibson

There is more to pacing than reaching the endpoint: Task fragmentation is a cognitive strategy in endurance sport
Pacing is a behavioural strategy adopted by athletes that involves distributing energy resources during an event in
order to achieve the fastest possible time without experiencing premature fatigue. In endurance events, athletes
are thought to adjust their pacing to preserve a sustainable rate of increase in perceived exertion so that the
maximal tolerable perceived exertion coincides with arrival at the endpoint. In a series of studies it was observed
that the so-called performance template is not only a function of the endpoint but also other geographically
convenient or otherwise relevant reference landmarks. In an Ironman triathlon predictable changes in pace that
coincided with the laps of the cycling and running course. We also found a different RPE trajectory between the
swim, cycle and run components resembling a dog-tooth pattern rather than linear increase in RPE as predicted by
the performance template (Parry et al., 2010: Br J Sports Med, 45, 1083-94.) We also found that during a lapped
running task schoolchildren, varying in age from 5 to 14 years, fluctuated their pace on a lap-by-lap basis indicating
a strategy that is influenced by the occurrence of geographical relevant landmarks in addition to the endpoint
(Micklewright et al., 2012: Med Sci Sports Ex, 44, 362-9.) Our pacing and RPE results indicate a tendency to
fragment longer exercise tasks into smaller constituents, and that such constituents appear to be defined by
geographical landmarks or other meaningful points in an event. While the endpoint remains the ultimate pacing
reference point, athletes also appear to use other relevant environmental cues to compartmentalize and perhaps
cope with enduring exercise tasks.
Dominic Micklewright

Psychological aspects of pacing: Forgotten findings, falsehoods, and future directions
The advent of pacing research has often been traced back to the seminal discovery by William Morgan (Morgan &
Pollock, 1970) who found that elite and non-elite endurance athletes employ remarkably different cognitive
strategies to aid them in completing long distance running events, and that these strategies profoundly influence
performance outcome. Unfortunately, several crucial aspects of Morgan’s findings remain long mischaracterized or
neglected, particularly results indicating that successful and unsuccessful athletes differ in their ability to accuracy
gauge perception of effort. This presentation will focus on rectifying major misinterpretations of Morgan’s
research as well as his conceptualization of the cognitive strategies of association and dissociation. Findings from
his early work that remain relevant to the current direction of pacing research will also be highlighted. Finally,
potential directions for research on psychological factors that could potentially influence both an athlete’s pacing
ability and willingness to endure the pain and exertion required for success in endurance sporting tasks will be
introduced.
Jack Raglin
Contested Bodies – Conflicts and Controversies about Dress Codes at International Sport Competitions.

In spring 2011, the International Badminton Federation decided to make skirts mandatory for female players, obviously, to increase the glamour quotient in this sport and to attract a larger audience. Bikinis in beach volleyball and increasingly “stunning” attire in tennis seemed to have enhanced the public interest in these sports. At the same time, sport organizations from Islamic countries demand that Muslim women be allowed to compete in all sports and events wearing the hijab. A third party in the struggle about the dress code is the Atlanta Plus Committee and its supporters who addressed the IOC in 2010 with the demand to exclude NOCs who force female athletes to wear “restrictive garments” such as the hijab.

In this paper I will explore the arguments and reasons as well as the political and ideological background of the various initiatives and groups involved in the “battle” about the appearance of female athletes. In addition, I will approach the dress issue from the perspectives of various groups of female athletes. Drawing on constructivist concepts of gender, religion and ideology, sport and taste, I will try to unpack the politics and policies of the dress codes as well as the open and hidden meanings.

Gertrud Pfister.

Sport in Society: Cultivating Fair Opportunity or Enforcing Unfair Inequality?

Official justifications of sport usually highlight its potential of including individuals and groups with different cultural, ethnic and religious backgrounds. From local policies to the Olympic value system sport is considered an important arena in heterogeneous societies for open communication and dialogue. The paper examines whether these premises hold water, and, if so, under what conditions.

On the one hand sport is structured around the principle of fair opportunity. In competitions all participants compete under the same rules. Eligibility and classification are defined mainly on the basis of previous performances and on inequalities between individuals that are seen to give unfair advantages/disadvantages such as inequalities in age, biological sex, and body size.

On the other hand sport is a typical product of modern, industrialized society with extensive (and many would say unfair) inequalities in resources and life conditions between individuals and groups. Olympic results reflect to a large extent existing inequalities in resources between nations. Mass sport participation tends to reflect social inequalities in society in general.

The paper discusses the status of sport in society as a model sphere for equal opportunity versus the view of sport as a reflection of problematic inequalities. In a concluding section it is pointed at several possibilities for how to strengthen sport as a model sphere.

Sigmund Loland

Sensitivity Towards Strangeness (STS)

Globalization processes encourage transnational migrations. Western societies become increasingly multicultural. Sport and physical education, as parts of society also become more and more multicultural. Research shows that
Sport organizations and physical education teachers are left alone with problems related to the increasing heterogeneity. Most of them are working on an assimilative perspective instead of focusing on integration. People seem to avoid the phenomenon of cultural difference. In addition, teachers perceive a gap between research and pedagogical practice. There is an obvious need of research within this field and in particular a need of developing scientifically controlled guidelines for practice.

In this paper it is intended to present a new approach within the field of sport and physical education. The general aim is improving mutual understanding between natives and strangers and a more rational management of conflicts within multicultural societies through the medium of sport and physical activity.

The theoretical focus is directed to concepts of difference and strangeness. A perception of difference is prerequisite for an experience of strangeness. But perceiving a difference does not always lead to an experience of strangeness. Only if another person or situation or if a perceived difference is difficult to understand or different from our expectations then people classify this as strange. This concept is not only referring to a state of feeling or perceiving someone or something as strange. Strangeness refers moreover to structures leading to such perceptions and mechanisms of how people deal with it.

In other terms, strangeness represents the limits of understanding. This induces uncertainty which can be realized as confusing, funny or irritating. The implicit uncertainty makes it difficult to deal with strangeness constructively. In addition, meeting the stranger confronts us with different values and knowledge and this can be perceived as a threat to our identity. The fact that we do not really know or understand what the other person or group stands for makes it so difficult to handle. Anyway, people feel to construct plausible pictures of the world around them. They judge strangers and attribute meanings towards strangeness even though the perceived difference is based on a lack of information. This often leads to misunderstandings, stereotypes or stigmatizations.

The specific approach of Sensitivity towards Strangeness (STS) tries to meet the challenge of learning how to deal constructively with difference and strangeness (Esser-Noethlichs, 2011). STS is related to openness, uncertainty management and identity development. Dealing with difference and strangeness constructively can promote identity development. In physical education situations can easily be created in order to experience acknowledgment and affiliation or inclusion. These are stabilizing elements in identity development and they are needed in order to tolerate uncertainty. It can also be experienced how it feels to be a stranger and with one’s own body as personal reference. Subsequent discussions are crucial element to develop an awareness and constructive strategies of dealing with strangeness.

STS is conceptualized and operationalized in order to measure outcomes of intervention research (Esser-Noethlichs, 2011).

Marc Esser-Noethlichs,

Critical Reflections on the Role of Sport in Pece Processes
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¹University of Johannesburg, South Africa; ²Sports Authority Israel, Israel; ³University of Brighton, United Kingdom

Critical reflections of the role of sport played in conflict resolution and peace building in South Africa twenty years after the end of apartheid.
Cora Burnett

Critical reflections on the role of sport in conflict resolution and peace building two decades after the Anglo-Irish Agreement.
John Sugden

Critical Reflections on the role of sport in conflict prevention and inter-community relations in Israel.
Uri Schafer
It’s Complicated: The Politics and Practices Of Sport in International Development

Kay, T*; Ahmad, A*; Cornejo Améstica, M*

1Brunel University, United Kingdom; 2*

In Nelson Mandela announced in 1995 that ‘sport has the power to change the world’, since when the international ‘sport for development and peace’ (SDP) movement has grown exponentially. Sport has been formally recognised by the United Nations and other transnational development organisations as a contributor to the Millennium Development Goals, elevating many sport organisations and personnel to new levels of status in international policy. These developments have inevitably attracted critiques that span a wide spectrum, ranging from the opponents who deride western-led SPD programmes as neo-colonial imperialism, to the strident advocates of ‘power of sport’ supporters.

This paper provides an empirically based consideration of the tensions and ambiguities that foster these polarised views. Drawing on fieldwork in Zambia, India and Brazil, it examines how externally funded programmes are reconfigured and reworked at local level. Its analysis highlights complexities in how local programme staff and participants engage with programmes, and in how research and knowledge about programmes are constructed. The paper especially highlights the value of participatory research conducted in-country through partnership approaches as a means to providing a more credible account of the complexities of SPD.

Tess Kay

The Hijab In Sport: A Political Symbol of Difference or a Symbol of Religiosity?

This paper examines the cultural-religious significance of the hijab to the Muslim female athlete. Drawing on the findings from a doctorate study on the sporting experiences of the British Muslim women’s football team (Ahmad, 2009) this paper will address the power relations that operate within and around the Muslim female footballer. The paper demonstrates how this small group of Muslim women used Islam as a tool for their liberation and a base that permits their participation in sport, thus reflecting an Islamic feminist ideology (Bahlul, 2000; Moghadam, 1994). The British Muslim women’s football team competed in the Women’s Islamic Games in Iran and this paper aims to highlight the ways in which the hijab was significant to these individuals and its relevance within a sporting context (Ahmad 2011; Benn et al, 2011). Data was collected through interviews and participant observation over a 4-year period of training with the British Muslim Women’s Football Team and competing at the Women’s Islamic Games. Findings revealed subtle forms of power inequalities that have previously been left unquestioned by those that suffer from them. The study illustrates how Muslim women have constructed their perceptions from their experiences of sport and position in society as a whole, showing how they can experience relative power, feeling both powerful and powerless simultaneously.

The British Muslim women’s football team found an avenue in which they could continue to be ‘visibly Muslim’ and participate in sport. The team challenged dominant western stereotypes of the typical heavily veiled and oppressed Muslim woman and challenged cultural stereotypes in competing in a ‘masculine’ sport. They challenged misconceptions and pushed boundaries in their choice to compete in the Women’s Islamic Games. This paper points towards the differing levels of religious freedom expressed by individuals and the ways in which individuals adapt and negotiate their values and their sports participation.

Aisha Ahmad

Sport Inclusion, Exclusion and Politics in Latin America.

History indicates that the aboriginal communities (ethnic communities) had games that symbolized their religious and social life. Those games had an important role in the life of the communities. Nevertheless with the arrival of the European conquerors and the incorporation of new games and sport practices, the aborigine’s practices and culture disappeared. Few cases, such as in Brazil, the capoeira is a corporal practice that has an international projection and that culture. In the latest years themes on the area of sport, PE, recreation and leisure are frequently discussed in Latin American congress. Research scout the Latin-American identity y its close relationship with sport has allowed diverse researchers to question about: the role of our history?, the actual situation of PE
and sport in Latin America? What are the interests that the actual Latin American society has in relationship with sport? And other questions have been around whether sport is an instrument of inclusion or exclusion, taking into account social diversity, ethnicity, economy and politics in each Latin American country.

Miguel Cornejo Améstica

S38

Measuring for Sport and Health

Stewart, AD; Marfell-Jones, M*; Hencken, C*; Riach, I*; Fawkner, S*; de Ridder, H

Robert Gordon University, United Kingdom; Open Polytechnic, New Zealand; Bodymorph Ltd, United Kingdom; SportScotland Institute of Sport, United Kingdom; Edinburgh University, United Kingdom; North West University, South Africa

While advances are being made in measuring the body using medical imaging and other lab techniques, there will always be the demand for practical, portable and cost-effective methods for assessing individual body size, shape and composition. Even with such methods, it is widely recognised that use of specialist anthropometric equipment without the necessary training can introduce large errors which are not acceptable by today’s scientific standards. This symposium encapsulates the very essence of why ISAK exists: in order to standardise the acquisition of anthropometric measurements and thus maximise their precision, accuracy and utility. The theme of Measuring for Sport and Health will be developed by a number of speakers who will, via a range of contexts, including surrogate measures for adipose tissue, discuss the development of an anthropometric profile, the detection of change, and the application of anthropometry to measuring children. Uniquely, ISAK has created a protocol for use worldwide, and has provided an international training and accreditation scheme for practitioners and researchers in over 50 countries. This symposium draws on the experience of key drivers and proponents of that scheme.

S100

Hydration and Exercise

Maughan, RJ*; Armstrong, LE*

Loughborough University, United Kingdom; University of Connecticut, United States

Fluid Intake, Thermoregulation and the Perception of Effort

The normal response to exercise is an elevation of body temperature. This is accompanied by a number of physiological responses aimed at supporting the increased metabolic rate of the active muscles (increased ventilation, cardiac output and local muscle blood flow) and dealing with the consequences (disturbed metabolic homeostasis). In prolonged, moderate-intensity exercise, there is a rapid increase in core temperature for the first 10-15 minutes followed by a relative steady state that depends on the relative exercise intensity. At high intensities and when the thermal stress is high, no steady state is reached and core temperature rises progressively until exercise is terminated. The degree of hyperthermia can be attenuated by increasing fitness levels or by ingestion of fluids, especially of cold fluids. Though the focus has been primarily on effects of fluid ingestion on performance, effects on the subjective perception of effort are apparent in the early stages of prolonged exercise. For the recreational exerciser, this effect may be more relevant than any effect on performance: a decreased perception of effort is likely to encourage exercise adherence. Further evaluation of strategies to reduce the perception of effort is required.

Ron Maughan

Effects of Fluid Loss and Replacement on Physical and Mental Performance

Humans continuously lose water from the kidneys, skin and lungs; these losses are counterbalanced by consuming beverages and food moisture. However, when fluid losses exceed the dietary intake of water, decrements of physical and mental performance can occur. Because thirst is not sensed until a 1-2% body mass loss exists, it is possible for mild dehydration to occur during daily activities involving no exercise. During exercise, larger body water losses are incurred (3-12% of body mass, depending on the intensity/duration, clothing, and
host/environmental factors), primarily due to sweat evaporation. Physiological strain (i.e., increased heart rate) is proportional to the water deficit, beginning at 1-2% body mass loss. Endurance exercise performance declines at approximately 3% dehydration, whereas strength/power performance falls at about 4-5% body mass loss. Sport skills also may decline as a result of dehydration. Recent well-controlled experiments suggest that a 1.5% level of dehydration approximates the threshold for a decline of cognitive performance (i.e., computerized tests of visual vigilance), increased fatigue and task difficulty, reduced vigor, and headache onset. In total, the aforementioned decrements of physical and mental performance illustrate the importance of fluid replacement, utilizing an individualized plan to counteract moderate-to-severe dehydration.

Lawrence E. Armstrong

S125

Is Technology Enhancing Sport? An Evaluation of Public Attitudes Towards the Impact of Sports Research
James, D*
Sheffield Hallam University, United Kingdom

Throughout the history of sport, reaching as far back as the ancient Olympics, athletes have always used the very best technologies at their disposal in order to enhance their performance. More than ever, science and technology are absolutely central to the modern sporting world, acting as a catalyst to keep sport evolving and to push the boundaries of the possible. However, this relationship can be an uneasy one; exactly where do we draw the line between providing the conditions for an athlete to achieve their personal best and providing an unfair advantage?

Throughout 2012, the Research Councils UK worked in partnership with the Royal Institution and Sheffield Hallam University to stage a series of six public events, each exploring the research behind a different Olympic sport. As well as focusing on the research that contributes to athletic success, the events also considered the ethical implications of this work. Audiences were asked to respond to a series of statements about the relationship between research and sport via wireless voting consoles. The accumulated data provides valuable and revealing insights into public attitudes towards the impact of sports research.

This session will present an analysis of the findings of this research as well as exploring some of the broader philosophical and ethical issues associated with the use of enhancement technologies.
President Rogge in his opening address at the Olympic Movement in Society Congress in Copenhagen, 2009 expressed his concern over the health of young people globally and the importance of the role of sport in society in addressing the issue:

“In the late 1800s, de Coubertin worried that youth in his native France were turning away from physical activity. Today, we see the same problem in the growing rate of youth obesity throughout the world.... We are here to make sure that the Olympic Movement will continue to serve athletes, the world’s youth and society at large for decades to come.” [1]

One of the themes during the Olympic Movement in Society Congress was “Olympism and Youth”. Following the presentations and discussions in Copenhagen on this theme, Recommendation #51 was proposed as guidance for members of the Olympic Family:

<#51> Everyone involved in the Olympic Movement must become more aware of the fundamental importance of physical activity and sport for a healthy life style, not least in the growing battle against obesity, and must reach out to parents and schools as part of a strategy to counter the rising inactivity of young people.[2]

Dr. Rogge’s opening address and the subsequent Recommendation (#51) from the Olympic Congress underscores the importance of the public health issue of the health and fitness of young people globally. According to the World Health Organization (WHO), physical inactivity is the 4th leading risk factor for global mortality behind hypertension, tobacco use and high blood glucose contributing to 3.2 million deaths globally per year. Sixty percent of all global deaths can be attributed to non-communicable diseases. 31% of adults around the world are physically inactive and 5.5% of all deaths globally can be attributed to inactivity, including cardiovascular disease, diabetes mellitus and some cancers. [3]

In 2010 the International Olympic Committee (IOC) and the WHO signed a Memorandum of Understanding, agreeing "to join efforts and to cooperate...to promote healthy lifestyles, physical activity and sport among the communities."[5] This collaboration illustrates the intention of the IOC to expand its mandate beyond the care of the elite athlete to also address global public health issues. According to the WHO, interventions to reduce non-communicable diseases require adequate and appropriate education to empower and encourage behaviour changes by individuals, families and communities. [6, 7] It is well established that the acquisition of knowledge and the development of healthy routines in childhood extend into adulthood. [8] As a result of this new mandate and in light of the importance of education in the success of influencing behavioural change, the IOC convened a Consensus Meeting in January 2011 to discuss the role of sport and physical activity in addressing the health and fitness of young people globally. There was a critical review of the scientific base in this field with the aim of providing recommendations and identifying potential solutions through the collaboration of sport with existing programs in this field.
This symposium reviews the highlights of this IOC Consensus Meeting. Prof. Armstrong sets the context for the subject by reviewing the scientific evidence on current levels of fitness and activity in young people. The health risks of physical inactivity are reviewed by Prof. Micheli including the risks of cardiovascular disease, metabolic disease, obesity, bone disease, mental health issues and sports injury. Prof. Van Mechelen outlines the phenomenon of inactivity investigating the correlates of sport participation and physical activity, the determinants of sedentary behaviour in youth as well as the determinants of sport drop out. A review of existing intervention programs looks at both evidence from school based interventions as well as community based interventions. Prof. Mountjoy summarizes the symposium with ensuing recommendations for action addressing the role of various organizations and institutions in the issue of sport participation and inactivity in youth.

In conclusion, sport has an important role to play in the current global health crisis of rising morbidity and mortality from non-communicable diseases caused by physical inactivity already starting at a young age. Together with other partners in inter-governmental organizations, government, education and health care sectors, sport can be instrumental in invoking behaviour changes in young people to positively affect global health. “Participation in sport has significant physical benefits, contributing to people’s ability to lead long and healthy lives, improving well-being, extending life expectancy and reducing the likelihood of several major non-communicable diseases.” [4]


Introduction - MOUNTJOY
Setting the Context: Are children fit and active? - ARMSTRONG
Health implications of inactivity - MOUNTJOY
What are the correlates of PA/inactivity/low fitness - van MECHelen
Options for change: evidence from community/school based programs - KREIMLER
Recommendations for action – MOUNTJOY

S6

Sport and Globalisation: Voices from ‘Margins?
Keim, M*
University of the Western Cape, South Africa

The Role of Universities in North – South partnerships for Sport, Development and Peace
Due to globalisation in sport and multi-stakeholder involvement including North – South partnerships there is a great need for scientific approaches to sports programming as well as curriculum development, training and professional development.
In terms of sport development and peace initiatives, many of which are situated in the global South with donors in the global North and are geared towards the millennium development goals, there is a need for interdisciplinary approaches, evidence-based sports interventions, management and monitoring and evaluation.
Over the last 20 years, North – South multistakeholder partnerships have increased especially in the field of sport and development including North – South university agreements with student and staff exchange, research
collaboration or project implementation in the field. There are challenges to making these relationships and projects sustainable and mutually beneficial. Different visions, values, ethics, world views, approaches to teaching, research and community engagement in the field of sport, development and peace can undermine the success of even the best intentions to programmes. It will be argued that the careful consideration of broader national contexts, histories and meanings need to ground sport, development and peace initiatives no matter where they take place, and that this consideration has too often been disregarded by the North when working in the South. The presentation and discussion will focus on the following:

What is the role of Universities in Sport, Development and Peace especially with regards to North – South partnerships and post graduate training?

Questions to be discussed will include:

Are North –South partner universities making active and intentional use of their resources and human capital to support a mutually beneficial sport for development and peace research, teaching and community development?

Can we as universities play a part to create awareness for more suitable and sensitive approaches from the North, regarding the approach to research in the development context.

Can the South teach the North?

How can we assist the next generation of sport and development researchers and academics through postgraduate training programmes which have a developmental and cross-cultural emphasis, to become interdisciplinary skilled “pracademics” with the necessary sensitivity for multicultural and global issues.

Marion Keim

S16

Pre-Clinical Risk Factors, Physical Activity and Fitness in Paediatric Populations
Stratton, G*; Boddy, LM; Murphy, MH*; Cunningham, C*; Hopkins, N*; Buchan, D*; Baker, J*; Green, DJ

1College of Engineering, Swansea University, United Kingdom; 2Liverpool JMU, United Kingdom; 3University of Ulster, United Kingdom; 4University of Western Scotland, United Kingdom

Physical Activity and Endothelial Function
In recent years the prevalence of obesity, physical inactivity, sedentary behaviour and low cardiorespiratory fitness in Western countries has increased rapidly. These variables are independently associated with cardiovascular disease risk and/or mortality. Atherosclerosis begins in childhood and endothelial dysfunction is its earliest detectable manifestation. Endothelial dys/function can be quantified using flow mediated dilation (FMD). We aimed to investigate childhood associations between endothelial function and a range of modifiable and non-modifiable CV risk factors. We provide novel information regarding relationships between physical activity, sedentary behaviour, body composition, cardiorespiratory fitness of endothelial function. Our findings indicate that whilst there are weak relationships between endothelial function and the cardiovascular risk factors measured, high intensity physical activity may have the greatest potential to enhance vascular health in young people at risk of endothelial impairment and future development of atherosclerotic diseases.

Nicola Hopkins, Gareth Stratton, Marie Murphy, Lynne Boddy, Conor Cunningham, Danny Green

Cardiorespiratory fitness and clustered cardiometabolic risk schoolchildren
We have measured clustered risk using invasive and non-invasive markers of cardiometabolic health in children in England Scotland Northern Ireland and Wales. Further we have quantified the relationship between cardiometabolic risk and cardiorespiratory fitness and physical activity. We have used receiver operating curves to propose a threshold of fitness below which children have elevated metabolic risk. The data suggest that participants at ‘high cardiometabolic risk’ were less fit than those with ‘normal cardiometabolic’ risk. The odds of being classified as ‘high risk’ over 10 times those classified as unfit. PA on the other hand was not a significant predictor in logistic regression analysis.

Gareth Stratton, Marie Murphy, Lynne Boddy, Conor Cunningham
The Effects of a High Intensity Exercise Intervention on Markers of CVD and Health
Recently, a growing body of evidence has found that the adaptations typically associated with traditional endurance exercise interventions may also appear through low volume, high-intensity interval training (HIT). This study examined the effects of a field based intense exercise intervention within the school In the HIT group, significant improvements in muscular power 10-m sprint, cardiorespiratory fitness and agility were noted. Waist-hip ratio (WHR) increased in the control group but not in the HIT group. The HIT group experienced a reduction in systolic blood pressure (SBP) though diastolic blood pressure (DBP) did not change. These findings demonstrate that brief, intense exercise is a time efficient means for improving cardiometabolic risk factors in youth.

Duncan Buchan, Julien Baker, Non Thomas

Sport for Development Teams with Sport Science and Medicine: Necessary Collaborators for a Learning Legacy.
Oglesby, C*1; Bergholz, L*2; Keim, M*3; Rordorf, I*4; Mwaba, M*5
1Beyond Sport, United States; 2Edgework Consulting, United States; 3Univ of Western Cape, South Africa; 4Streetforballworld, Germany; 5NOWSPAR, Zambia

The Work of Beyond Sport
Beyond Sport is a global organization that promotes, develops and supports the use of sport to create positive change across the world. Created in 2009, brainchild of the fertile genius of Nick Keller, Beyond works through three main avenues: 1) Annual Summit where literally thousands devoted to sport and development network and celebrate awardees; 2) Beyond Sport Award Program is a process whereby as many as 400-500 submissions describe the sport for development work around the globe in categories such as sport for health, education, environmental awareness, social inclusion and many more. Three short-listed candidate organizations in each category are flown in for the Summit and the eventual winner receives incredible capacity-building benefits for the succeeding year; 3) Beyond Sport World an on-line networking platform allowing organizations involved in sport for development to promote their activities and connect. Beyond Awardees are selected with a strong emphasis on sound evidence base and design. Many academic researchers are involved but there is room, and need for many more. The Panel today makes this clear.
Carole A. Oglesby

The Work of Edgework Consulting
Two examples of research-driven sport for development program designs will be presented: Doc Wayne USA and UNICEF Namibia Sport-2-Life. These examples will be used to depict the tremendous gap that currently exists between research and practice. From the unique vantage point as a consultant working with a broad range of S4D organizations, many opportunities will be described for researcher-academics to contribute including the following: 1) Partnering with S4D programs to conduct meaningful and in-depth evaluation; 2) Promotion of an evidence-based approach bringing current research to organizations for direct use; 3) creating and testing emerging research and evaluation methods; 4) generating funding for new research and practice.
Lou Bergholz

Building Networks for Sport, Development and Peace
This presentation examines the concepts of collaboration and networking to raise awareness of the importance of better understanding the multitude of possible partnerships in the area of youth development through sport. It draws on various theories and practical examples including the case study of a South African network of civil society organizations using sport as a tool for youth development and peace building. It looks at challenges and fears and also successes and good project implementation affecting the lifelong engagement of youth in sport and physical activity.
Marion Keim

The Work of StreetFootballWorld
The StreetFootballWorld network consists of over 90 social profit organizations around the world that use football
to address issues in their communities. The stories of 2 network members, and their partnerships, will be presented. A description will be presented of InFocus, newly developed online software that assists sport for development organizations in measuring and communicating the positive social impact they achieve as well as to help government, funders, and the general public understand how programs using football and sport can have an impact.

Imke Rordorf

The Work of NOWSPAR
The National Organization of Women in Sport, Physical Activity and Recreation is a membership organization of Zambian women founded by Matilda Mwaba. The mission of NOWSPAR is to advocate for the equal participation of women and girls in sport at all levels through research, policy analysis, awareness raising and capacity development. These processes occur in regard to individuals and organizations for the purpose of enhancing the delivery of sport for girls and women. Programs include the following: Every Body Matters (community programming); SHEROES(mentor program); She Got Moves (community dance and movement programs); Women and Sport Leadership Network.

Matilda Mwaba

S69

Sports For Development
Bukhala, PW*1; Misener, L*2; Forsyth, J*2
1Kenyatta University, Kenya; 2University Of Western Ontario, Canada

Sport is not a new element in development cooperation. It has been used in an ad hoc way to reach development-related objectives as far back as the 1920s. The United Nations has used sports as a means to improve the conditions of people affected by conflicts and natural disasters for many years. Sport is also increasingly recognized as an important tool in helping the United Nations achieve its objectives, in particular the Millennium Development Goals. In Kenya the Vision 2030 manifesto endorses sport as one of the key pillars of development. Despite this recent progress, the systematic use of sport and physical activity for development in developing countries has not been well documented as there is no centralized coordination to monitor the impact of sports for persons with disabilities for development in these countries. In addition there still remains many unconvinced of the impact disability sports can have on development and humanitarian objectives.

The development of the Paralympics sports globally has ensured that sport can be enjoyed by all, including those with physical and intellectual disabilities. The Paralympic movement has been shown to have the ability to break down walls of prejudice and discrimination, while showcasing courage, motivation, empowerment and inspiration to others. The present study documents the role of Paralympic sports in the development of athletes with disabilities in the East African region in the current social, economic and ideological context of the developing nations of the world and identifies the growing number of national and international agencies and organizations using Paralympic sports in their development programming, and discusses challenges, opportunities and prospects.

Peter Bukhala

Leveraging Parasport Events For Sport Participation
Much research on events has focused on the concept of legacy, recognized as the long-term economic, tourism, social, and environmental outcomes for a host city from staging events (Gratton & Preuss, 2008). An emerging focus on event leverage represents a paradigmatic shift away from solely impact or legacy studies to the examination of the strategies and tactics required to optimize desired outcomes from events. O’Brien and Chalip (2007) defined leveraging as “the implementation of strategies by stakeholders to maximize the benefits from hosting an event or festival” (p. 142). Leveraging Theory recognizes that the outcomes from events depend not on the mere fact that an event has taken place, but rather on the ways that events are used (often in combination with other marketing and management resources) to render desired effects (Chalip, 2004; 2006). While recent
research has begun to focus on developing strategies to leverage the social outcomes of events, there is a paucity of research focusing events for athletes with a physical disability (parasport events; i.e. Legg & Gilbert, 2010). It is widely believed that parasport events have the potential to drastically affect social change through awareness about disability, enhancement of infrastructure, and visibility of sport opportunities. However, there is little evidence to demonstrate these outcomes. Through a narrative analysis of multiple parasport events, this paper focuses on emergent leveraging tactics being used by parasport event organizers to affect social change and enhance awareness about disability and opportunities for parasport participation. In this way, it is possible to more clearly understand the potential leveraging opportunities, tactics, and strategies of parasport events, and how they may be utilized to positively influence social change. key words: leverage, paralympic, sport participation.

Laura Misener

The Cost Of Inclusion: The IOC’s Agenda 21, Aboriginal People, And Sport Development
Olympic ceremonies have historically been a fertile ground for the promotion of nationalist ideologies. Central to these stagings are cultural iconography that reinforce popular ideas about a country and its people. In recent decades, these images and symbols have also amounted to an important source of revenue for the Olympic industry. It is the confluence of these two trends – the commercialization of Olympic properties, including cultural iconography, and state ideology – that will be examined in this paper. The focus of analysis centers on the positioning of Aboriginal people in Agenda 21, an IOC policy document that serves as the blueprint for how Aboriginal people and other marginalized groups will be included, and ostensibly benefit from, the hosting of Olympic Games. This paper will use the Vancouver 2010 Winter Olympic Games as a case study for why marginalized groups, hoping to reap Olympic rewards for sport development reasons, should proceed with caution.
Janice Forsyth

S128

Physical Activity and Cancer
Dickhuth, H H*; Dimeo, F*; Wessner, B*; Baumann, F T*
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Physical Activity and Cancer
Fatigue and loss of physical performance are frequent problems of cancer patients. Several biological, psychological and social factors have been suggested as an explanation for the origin of fatigue in this context. In most cases this symptom has a multifactorial genesis. However, recent studies suggest that fatigue may originate from alterations in the muscular energetic systems caused by cancer and its treatment. Furthermore, there is convincing evidence indicating that exercise programs help prevent cancer fatigue and may reduce its intensity. In our lecture we present the actual evidence on the relationship between fatigue and impairment of physical performance in cancer patients, report the results of studies about the effects of exercise in cancer patients, and suggest new directions for research.
Fernando Dimeo

Exercise and cancer cachexia: A molecular point of view
Cancer cachexia, the involuntary loss of skeletal muscle as well as adipose tissue mass due to cancer, leads to weight loss, a reduced quality of life, pronounced morbidity and a higher mortality rate. The extent of weight loss is dependent on tumour type and occurs in 30-80% of cancer patients being an important prognostic factor as a higher loss of weight coincides with a higher mortality rate and/or recurrence of the tumour [1]. Including physical training into the rehabilitation programme of cancer survivors seems to be essential in increasing quality of life, muscle strength and in lowering cancer-associated fatigue as well as mortality [2]. However, in order to effectively treat cachectic cancer patients it is necessary to understand the molecular mechanisms leading to skeletal muscle atrophy but also hypertrophy. Usually, skeletal muscle mass is maintained constant by balancing protein synthesis and degradation. During cancer cachexia protein degradation via proteolytic pathways such as the ubiquitin-
proteasome pathway is enhanced while protein synthesis is reduced [3]. Additionally, apoptosis of muscle cells and
the development of a pro-inflammatory state contribute to the loss of muscle mass. Various exercise interventions
have been shown to effectively counteract these alterations but the optimal type, intensity, and timing of training
programmes should be investigated in more detail.
Barbara Wessner

Physical exercise with cancer patients during chemotherapy and radiation

Introduction: Cancer patients suffer not only because of illness and medical therapies but also due to lack of
mobility during the phase of chemotherapy [Baumann 2009]. Between 70 and 100% of all cancer patients are
suffering from fatigue during chemotherapy [Mock 2001, Jacobsson 1998, Irvine 1994]. In addition, the
psychological burden is enormous and have a detrimental effect on their quality of life.
Results: In our studies we show a positive effect of endurance training on physical constitution and quality of life
on leukemia and lymphoma patients during high dose chemotherapy. With breast cancer patients we made
resistance training during chemotherapy. The level of resistance of the patients was maintained and even
increased. Regarding the assessment of quality of life, as significant improvement could be achieved in Fatigue.
Discussion and Conclusion: Physical exercise programs still play only a minor role during the treatment of cancer
inpatients. Only limited experience exists regarding resistance training with cancer patients [Courneya 2007]. No
signs of complication were registered in our studies. Different therapeutic exercise interventions for the individual
cancer entities are necessary due to varying medical treatments and side effects. However, further studies have to
be conducted, in order to better understand the exact effects of exercise and the different training intensities.
FT Baumann, Sporthochschule Köln
Major Sporting Events

S13

Football and Spectatorship
Mumford, S*1; Jones, C*2; Erhart, I*3
1 University of Nottingham, United Kingdom; 2 University of Wales in Cardiff, United Kingdom; 3 Bilgi University, Turkey

Purism and Partisanship
This talk will develop a distinction made originally by Dixon between purist and partisan ways of being a sports fan. The partisan supports a team whereas the purist watches sport for its aesthetic values. It will be argued in this talk that the distinction between purist and partisan can be defended, though not quite in the way Dixon makes it. Purism and partisanship will be distinguished as different ways of watching sport such that the purist and partisan watching the same game can literally see different things, even with the same view of the same events. This will be supported by claims from the philosophy of aesthetics, the psychology of perception and art history. Dixon and others have defended the partisan way of watching sport. This defence will be challenged and purism supported. Although the purist has a different kind of experience from the partisan, including a different kind of emotional experience, it will be argued that there is no all-round argument for thinking it inferior.

Stephen Mumford

Female Football Fans in Turkey
This research focuses on the female football fans in Turkey. Interviews are conducted with fans of the four largest football clubs (Beşiktaş, Galatasaray, Fenerbahçe, Trabzonspor) residing in Istanbul and Trabzon with a purpose to understand their love of football which is still considered a masculine sport in Turkey. Their game viewing habits and motivations as well as their frequency of following mass media, sports programs and membership to online forums and fan groups will be analyzed. The research will also focus on the positive and negative reactions they receive in the football stadium, the so-called last fortress of manhood in Turkey.

İtir Erhart

The Ethics Of Spectator Chanting In Football
The behaviour of elite football, both on and off the field, continues to make headlines for the wrong reasons. Violence, cheating, bad language, drunkenness, infidelity and criminality are commonly associated with some of the highest paid stars. Since the apparent decline of football hooliganism the behaviour of those watching football attracts comparatively little attention. In this paper I want to draw attention to a range of vices which characterise football crowds. Racism, homophobia, sexism, anti-Semitism, sectarianism, aggression, xenophobia, parochialism and chauvinism are common characteristic of both individuals and crowds at football. Although football fans and football crowds demonstrate important virtues like loyalty and commitment, the vices listed are also too often present. I argue that offensive chanting and abuse should not be tolerated or accepted in football stadia and action should be taken against individuals and clubs more regularly to discourage this anachronistic practice.

Carwyn Jones
London: Global City and Olympic Legacies
Horne, J*; Krüger, M*; Terret, T*
1University of Central Lancashire, United Kingdom; 2Department of Sport Science, Germany; 3University of Lyon, France

Continuity and Change in London Olympic Narratives: 1908-2012
London first staged the Summer Olympic Games in 1908, stepping in at relatively short notice after Rome withdrew. After the Second World War, London once again took up the challenge of staging an Olympic Games at short notice. In the context of war devastation, rationing, and general shortages, the 1948 Olympics were staged as economically as possible, and have subsequently been dubbed the 'Austerity Olympics'. The UK did not again contemplate campaigning to stage the Olympic Games until the late 1970s. An abortive London bid to stage the 1988 Games presaged a series of failed bids, before eventual success in 2005. Indeed the UK is only the second nation to be awarded a third Olympic Games, and London is the first city to stage a third Summer Olympic Games. The main focus of this presentation will be on how 'London', 'Englishness/ Britishness', 'sport', 'the world' and 'Olympism' have been constructed in the three Olympic narratives of 1908, 1948 and 2012. Archival resources including documents (guide books, bid documents, reports, newspaper accounts, and media reportage) and images from 1908, 1948 and 2012 will be analysed to identify and compare the key narrative themes for each of the London Olympic Games.

John Horne

The German Participation in the London Games
When Olympic Games took place in London in 1908 and 1948, the German turner team participated officially in Olympic Games, was in 1908. The Deutsche Turnerschaft, the biggest organization of the world at this time for physical exercises, tried to use the London Games for demonstrating the German system of gymnastics and exercises. But the sporting world in general and the English especially showed little interest. After this London experience the German turners were enforced in their opinion to decline the Olympics. In 1948, no German team and no German sportsman were able to participate in the first Games after the Second World War. The simple reason was that neither a German national state nor a German Olympic Committee still existed. The only men who experienced the games were the German “Mister Olympic”, Carl Diem, who was invited by his old friends in the IOC, and the German artificial gymnast Helmut Banz. As a prisoner of war in Britain he coached the British Gymnastics team.

Michael Krüger

London-Paris-Berlin:A Media Analysis of the Olympic Games 1912
Between 2005 when London was chosen to host the XXXth Summer Olympic and Paralympic Games and the opening ceremony in 2012 the international press has widely reported on the preparation of the World’s largest sport event. For sure the perception of the journalists during this period has been influenced by the political relations between their own country and the UK. In the case of France, the fact that Paris also bided in 2005 and was eliminated thanks to the victory of London cannot be neglected. The analysis of one of the largest French newspaper, Le Monde, therefore shows that the articles emphasise and comment the difficulties and problems the organisers have to face. They for instance focus on the high cost of the security rather than of the reduction of the terrorist risk. They highlight the fact that London did not present the real budget when it was asked for. These economic considerations can be analysed as a consequence of the Olympic concurrence between London and Paris, but they also must be evaluated in the light of the economic crisis which divides Europeans, as some comparisons with the German press also help to understand.

Thierry Terret
Spectrum of Medical Problems Encountered at Major Sporting Events
McDonagh, D*; Philips, N*
1Norway; 2United Kingdom

An event physician and physiotherapist must be able to adequately cope with the wide range of injuries and illnesses, be they major life-threatening disorders or simple head colds, that can occur at a major event. The ability of the medical staff to diagnose and treat such disorders can have long term consequences for the athletes health and sporting career. The team staff and the event staff must be competent and experienced in tackling not only medical conditions, but also looking after all aspects of the athletes well-being in this stressful and challenging environment. Both speakers will address a variety of issues based on their years of experience as both event planners and team medical staff.

Mega sporting event legacy (DCMS)
Girginov, V*; Horne, J*; Roche, M
1Brunel University, United Kingdom; 2University of Central Lancashire, United Kingdom; 3The University of Sheffield, United Kingdom

Olympic Legacy: Construction, Governance and Leverage
This paper examines the concept of Olympic legacy and develops an argument which frames it as a construction, governance and leverage process. The study is based on five years of empirical research with various Olympic stakeholders. Using the London 2012 Olympic and Paralympic Games as a case in point a link is made between Olympism, as a normative and developmental project promoting universalised visions of the ideal citizen, and current concerns with Games’ legacy. The power of the Games to mobilize huge symbolic and material resources is analysed against the distribution of the benefits accrued from this event fairly and sustainably across society. Despite the universalising claims of Olympism the delivery of any legacy is essentially a socially and politically constructed process, which involves a range of actors at local, national and global levels and years of negotiations. Olympic legacy is discussed not as a retrospective but a prospective concept concerned with shaping the future through interactions between the state, market and society. This entails designing systems of governance to guide and steer collective actions towards a consensus amongst various parties concerned, which makes legacy a governance issue. The limitations of legacy governance are exposed. The socially constructive nature of legacy also suggests that Olympic benefits will not accrue automatically but have to be planned and secured through various mechanisms. The case of the UK National Governing Bodies of sport in leveraging the opportunities presented by the Games is analysed.

Dr Vassil Girginov

‘Managing Olympic Legacy – Before and After London 2012’
This paper will briefly review Olympic legacy management processes that have emerged in the last decade and comment on their effectiveness. Because legacy management processes are still evolving and there remain gaps, loose ends and shortcomings in legacy management protocols and procedures, it will be argued that legacy management is a more difficult exercise than Olympic Games management. The following issues will be considered:

- The diffuse character and variety of legacy objectives
- The problem of legacy assessment and its time frame
- Legacy governance
- The monitoring of legacy by an Olympic city and the IOC
- The policing of legacy
Research into legacy management
A central issue is whether legacy management can ever match the lofty legacy objectives and rhetoric that has become prominent in Olympic discourse. A related issue is whether legacy management practices can be reformed and improved to deal with various shortcomings in legacy practice.
John Horne *
*This paper draws upon work conducted in conjunction with Professor Richard Cashman, UTS, Australia, whose contribution is hereby gratefully acknowledged.
Pedagogy

S15

Sports, Brain Development and Education in the 21st Century
Wexler, B*; Dong, J.X.*; Kirk, D.*
1Yale University, United States; 2Peking University, China; 3University of Bedfordshire, United Kingdom

The 20th century saw great advances in understanding the role of stimulation from the environment in shaping brain development after birth. The beginning of the 21st century has seen efforts to harness this neuroplasticity to treat disease and, more recently, to enhance normal brain development. This paper will describe a new program for young children of computer-presented brain exercises and physical exercises to cross-train the brain and increase cognitive skills. It will also review the neuroscience foundation for the programs such as these.

Bruce Wexler

A Study of Social and Cultural Impacts on Children’s Involvement in Sport in 21st Century
Background: Sport is often considered not only as an opportunity for children to learn culturally relevant sports skills, but also as an environment for teaching children important attitudes and values such as competition, sportsmanship, discipline, authority, and social relationships. However, the realization of this presumption is largely determined by a number of social agents who influence directly or indirectly young children to involve in sport. These agents include parents, teachers, peers, administrators and the mass media.
Aims: To promote childrens sport globally it is crucial to investigate the respective roles of the agents and their relationship with children and sport.
Methods: Literature review, case studies and educational experiment in China.
Results: This paper explores the following social and cultural issues relating to children and sport: how teachers attitudes towards sport affect childrens participation in sport; how parents interest and expectation affect their children participation in sport; how coaches develop appropriate relationship with parents; how public concern about childrens safety in the community affect childrens engage in sport; how to attract children into sport in the era of computer and internet; how to run sports programs for children from different social and geographical stratification; what challenges and problems are faced with children and sport at both elite and recreational levels in 21st century.
Conclusion: By analyzing the social and cultural factors behind children and sport the paper claims that sport can play important part in childrens overall development, but this can only be done by concerted efforts of government, school, community and family. It also suggests that different approaches should be taken when different age, social class and geographic locations are referred.

Jinxia Dong

Sport, pedagogy and physical culture for the 21st century
There can be no question that school physical education ¨C and in particular secondary school physical education ¨C has in the first decade of the 21st century lost its place as the primary preparatory sport experience for young people. Many young people now experience sport for the first time outside the school, in clubs, the family and other community settings, from the age of five or even younger. The nature and quality of these experiences are however determined to a large extent by geographical location, social class, gender, disability and a range of local cultural values. In this context, I ask in this presentation first, how we might think differently about how we
prepare young people to engage with the physical culture of their societies including their participation in sports, and second, that we consider how physical cultural pedagogy (the interacting and interdependent elements or learning, teaching and curriculum) might be reconfigured to meet new needs and address new challenges. I conclude that there will be multiple sites for young peoples engagements with physical culture, that we have a special responsibility to prepare them appropriately for such experiences, and that digital technologies will inevitably and increasingly play a part in the process.

David Kirk

Putting the Right People into the Right Places - The Long-Term Impact of Workforce Planning
Driscoll, J*; Wernham, F*; Booth, J*
*sports coach UK, United Kingdom; **sportscotland, United Kingdom; ***Professional Golfers’ Association, United Kingdom

Overview – Preparing the Coaching Legacy for 2012
As host nation to the 2012 Olympic and Paralympic Games, Britain has been subject to intense scrutiny from media, politicians and public to provide a long-term legacy for sport. The expected surge in participation around the Games will put added pressure on schools, clubs, local authorities, Governing Bodies and others to provide the coaches and officials required to meet the growth in participant numbers. The role of these coaches and officials has been acknowledged for many years. The need to recruit, develop and deploy them effectively is as important for the local sports club as it is for a national team preparing for world-championship competition.

The last three years have seen dramatic progress in the UK in how sports have taken the theories of long-term athlete development and applied them to workforce planning for practical long-term benefit. The session will outline the National Agency’s strategy, including the need to build the connections between academic research and practical implementation at local, regional and national level. After an overview of how sport is structured and funded in the UK, the session will summarise the results of a long-term research project into sports coaching, which has generated robust statistics on the recruitment, development, deployment and attrition of coaches. A traditional characteristic of coaching in the UK is the dependence on volunteers, who give up their spare time each week to support their local club or association. The challenges for the training and development of this volunteer workforce will be examined and a snapshot of the past 10 years’ developments in coach education will be presented. From a simple vision in 2002 to a point where more than 30 sports have their coach education programmes endorsed to a common quality standard, it’s not been an easy journey, but one from which other countries could learn.

Having good coach education programmes is only part of the story. The major step taken by several sports in recent years is to undertake detailed workforce audits, to compare supply and demand and so ensure that their strategies are delivering the right numbers of coaches, in the right places, to work at the right level according to the demands of their sports. The process starts with detailed mapping of the sport, using the Long Term Athlete Development Model as a guide. A clear picture of all participants, together with their needs, allows the sport to develop its planning and sometimes its complete structure to unlock potential growth. Looking ahead, the session will close with a focus on development plans linked to the 2014 Commonwealth Games in Glasgow and the 2016 Olympics in Rio.

John Driscoll

The Long-term Impact of Workforce Planning
The session will provide a brief overview of the structure and funding of sport, detailing the contribution of sportscotland – the national agency for sport in Scotland – toward supporting the education and development of coaches in Scotland. It will summarise the investment areas, programme and project areas and infrastructure to support partners in having the right people in the right places at the right time. It will outline the approach to supporting new coaches coming into the system, together with the need to develop and retain those already involved.

Understanding current and future workforce requirements is a continual challenge for the national agency, as well
as for local and national partners. The session will outline approaches taken to accelerate this, along with a case study of a sport which has used workforce understanding to influence their strategic planning.

Fiona Wernham

Right Coach; Right Place; Right Time: The 21st Century Vision for Golf Coaching Across GB and Ireland

This case study examines the long-term change programme being undertaken by the golfing organisations across Great Britain and Ireland in relation to their framework for coaching. ‘Right Coach; Right Place; Right Time’ is the collective 21st Century vision for coaching shared by these partner organisations, with the change process being led by the Professional Golfers’ Association. The impetus for change within the golf coaching system was created by the launch of the UK Coaching Framework. This provided a clear reference point for the development of a cohesive and ethical coaching system. Through the adoption of a five-step approach to managing change, the partnership have established a clear coaching vision and philosophy that will provide the foundations for all coaching related development in the forthcoming years.

The first step in this process has been an investment of time into building a story that tells and sells the vision in simple terms. This vital first step has helped to secure buy-in to the long-term vision and associated developments, and has also led to the establishment of a communications plan with clear key messages for specific target audiences and stakeholders.

One of the biggest challenges associated with the development of the vision for golf coaching has been to develop an understanding that this is actually a major change programme and must be led and managed accordingly. The culture of sports development has generally been linked to three or five year funding programmes, after which new programmes emerge. Altering perceptions to view this particular coaching system development as potentially a 20-30 year change programme has been an interesting journey.

The session considers how, by viewing and managing the development and implementation of a world-leading coaching system as a major change process, the sport of golf can sustainably shift the culture of golf coaching. Through the practical application of a simple change process, it reflects on the impact of adopting a long-term approach to change in sport and makes recommendations as to how the learning from this process in golf could be utilised throughout the sports development and coaching sectors.

In conclusion, the speaker will present the journey of change undertaken by the golfing organisations within Great Britain and Ireland in relation to the development of their 21st Century vision for coaching. This is a challenging, complex, exciting, frustrating, interesting and rewarding story of coaching framework development.

Jane Booth

S20

Olympic Pedagogy - Common Global Concerns and Different Continental Teaching

Binder, D*; Culpan, I*; Naul, R*

1 EDI Educational Design International, Canada; 2 University of Canterbury, New Zealand; 3 University of Duisburg Essen, Germany

Introduction

The roots of Olympism related to education go back to the most essential writings of Pierre de Coubertin and his critique about the lacking of the modern revival of the “antique gymnasium” as a permanent place of a balanced educational development of body, will and mind for youth. Both, the Olympic Games and the antique gymnasium should have been re-invented by the modern Olympic movement. Coubertin’s concerns about this lacking of the Olympic movement, expressed in one of his “Olympic letters” and his famous book on “La Pédagogie Sportive” (1922) are both frequently assessed as the real historical source of modern Olympic education worldwide which main ideas and ideals have been copied for the different versions of the IOC Olympic Charter up today (cf. Naul, 2009).

Olympic Education in Africa and the Americas

The Olympic Charter provides a potential framework of shared values for Olympic educational initiatives of National Olympic Committees, educational systems and youth sport organizations. Methodologies and
implementation strategies differ, however, from country to country. This presentation will highlight approaches to Olympic education in several specific sites in Africa, in North America, and in Central and South America.
Deanna Binder

Olympic Education in New Zealand
The literature highlights the contested nature of Olympism and Olympic education. Indeed some scholars argue that Olympism is a remnant of an age gone by and others argue that Olympic education is ‘ideological inscription’ and even ‘pedagogical’. This presentation will highlight these critiques and in so doing suggest a need to move to Olympism education as opposed to Olympic education. The presentation will outline how Olympism education in New Zealand, as advocated by the University of Canterbury, has placed Olympism at the core of its programm and the Olympic movement at the margins. By doing this there is a need:
- For the adoption of specific pedagogies that will better address the bi-cultural needs of our learners
- To holistically critique the movement culture in order to move towards fostering a critical consciousness that will encourage learners to take social action against injustices, inequalities, rampant consumerism and non-ethical and non virtuous behaviours in sport.
In identifying these needs this presentation will conclude by arguing that in New Zealand, Olympism education is a legitimate part of the physical education curriculum.
Ian Culpan

Olympic Pedagogy across Europe
The term of “Olympic education” was only established in the mid 1970s, when promotion of Olympic education get more supported by IOA seminars for teachers, coaches and students and more supported by education programmes of the new established National Olympic Academies (NOAs), particularly across Europe since the end of the 1980s (cf. Naul, 2010). The Centennial Olympic Congress at Paris (1994) become a breakpoint for a stronger promotion of Olympic education by the IOC, particularly as a part of the bidding process of cities to host Olympic Games (for Olympic Games since 2002) as well as for funding research of children and youth sports and young people’s assessment of Olympic ideals (Telama, et. al. 2002). Another turning point of the IOC is seen in the inauguration of the Youth Olympic Games (2007) with the promotion of Olympic Values to young athletes and the promotion of physical activity and a healthy lifestyle for all young people to counteract the ongoing development of sedentariness and overweight, particularly since the Copenhagen Olympic Congress (cf. IOC, 2009; Bogner & Sebastini, 2009). The paper will focus on selected results of a study which includes five groups (A., B., C., D., E.) of in total 15 different criteria to evaluate and to compare the development of Olympic education programmes of ten EU-countries. This study goes back to an early initiative in 2004 (cf. Binder & Naul, 2004) and further detailed research applications to IFOSE and the IOC (cf. Binder & Naul, 2007; Naul & Culpan, 2009) but was never supported and funded neither by the International Federation of Olympic and Sport Education (IFOSE) nor by the International Olympic Committee (IOC, 2009). Five major criteria for the review are: A. Information: definition and concept of Olympic education; B. Teaching: Olympic education and the PE curriculum, Olympic education extra-curricular activities; Olympic education as a part of non-school based youth sport programmes; C. Training: Olympic education as a part of PE teacher and sport coach training, Olympic education within further education/training programmes and activities; D. Products: kinds of teaching materials and products, web pages; E. Research and evaluation items. Among the countries are from the East: Czech Republic, Poland, Russia and Ukraine; from the West: Germany, France and the UK; from the South: Greece and Spain.
Roland Naul
Role Of Olympic And Paralympic Movement In Education And Awareness

Fliess Douer, O*; Prof. Dr. Doll-Tepper, G*; Prof. Dr. Thompson, WR*; Mansell, M*; Downs, P*
1Zinman College of Physical Education and Sport Sciences at the Wingate Institute, Israel; 2Freie Universität Berlin, Germany; 3Georgia State University, United States; 4British Paralympic Association/NASUWT, United Kingdom; 5Australian Sports Commission, Australia

Sport As A Global Phenomenon – Using The Potential Of Sports

Sport in today’s societies has many faces and facets, it includes recreational activities, sport for all, traditional and indigenous games and sports as well as high performance sport.

Physical activity and sport are practiced in a variety of settings, including schools, sport clubs and communities to name but a few. Sport in its broadest sense includes “all forms of physical activity that contribute to physical fitness, mental well-being and social interaction” (see UN Inter-Agency Task Force on Sport for Development and Peace 2003).

Sport initiates and reflects changes in society and addresses issues of equal opportunities and inclusion. Empowerment through sport is important for all people; it is, however, of particular importance for those who had less opportunity for participation, such as girls and women, children and youth from disadvantaged families, people of older age and persons with disabilities.

With regard to persons with disabilities many countries all over the world are currently implementing the “UN Convention on the Rights of Persons with Disabilities”. Article 30 focusses on “Participation in cultural life, recreation, leisure and sport” and calls for action to ensure that persons with disabilities have equal opportunity to participate in sport to the fullest extent possible, either in mainstream sporting activities or in disability-specific sporting and recreational activities. Inclusive physical education in schools is especially required and needs to be provided on a high quality level. The presentation will highlight current efforts from an international perspective and examples of good practice will be shared.

Gudrun Doll-Tepper

After-School Programs And Summer Camps For At Risk Youth – Sports Based Youth Development

Kids who have no place to go - end up going nowhere. Kids with some place to go - end up going places. Every day in the United States as many as 15 million children leave school with no place to go. And every day many of these children are involved in crimes, join gangs, or experiment with drugs, alcohol or sex. The highest juvenile crime rate occurs during the hours of 3:00 and 6:00 PM (after school). In the inner city of Atlanta and in major cities across the world, the statistics are no different. After-School All-Stars offers a proven alternative for middle school children during these critical hours of the day. We engage them in activities and on-going relationships that increase confidence and encourage success in all areas of their lives - at home, in school and in the community.

After-School All-Stars provides comprehensive out-of-school programs that are fun for kids and also keep them safe and help them achieve success in school and life. This program improves kids’ lives by nurturing their minds, bodies and spirits through programs that incorporate independent learning, academics and enrichment activities. Programming falls into five highly structured and organized categories, each led by a Certified Teacher: Academic Remediation and Enrichment, Cultural Enrichment, Technology, Sports and Recreation, and Parental Involvement. In Atlanta, over 2,800 children participate in the after school programs every day and over 700 attend the 6-week summer academies

After-school programs and summer camps are one of the few places where low-income, urban students have the chance to receive structured and safe health and fitness activities. With research showing 33% of kids in the U.S. either overweight or obese by the 3rd grade, After-School All-Stars is tackling the childhood obesity crisis by helping kids become more active and knowledgeable of healthy eating choices. After-School All-Stars continues its commitment to becoming a leader in the emerging field of sports-based youth development and to intentionally connect sports activities to lessons on leadership, nutrition, community service, gender equality and exposure to nature and the outdoors. Our program is currently being supported by the Fox Sports Network and by coaches provided by the AmeriCorps-funded Coach Across America programs. Sports programs typically emphasize the
non-traditional sports including hiking and camping on weekend trips or during the summer.

Walt Thompson

Paralympic Education In Schools “Ability V Ability” Project – Providing Inspiration To Young People To Help Them Deliver Their Own Personal Best

This Presentation will examine the use of Paralympic Games and Sports for changing the way society looks at disability. Paralympic Sports have been used in adapted/physical education to educate non-disabled students on disability. This concept is called Reverse Integration. One of the question that we may like to address in the future is: Is Paralympic/Disability Sport still seen as sport that is for people with disabilities only, or is it seen as sport which can be played outside the Paralympic arena by all?

The aims of the programme are:

- Raise awareness of the Paralympic movement
- Help young people appreciate more fully the nature of an inclusive society
- Recognise the achievements of Paralympic athletes
- Dispel the myths about sport and disability
- Provide examples of sporting excellence, in both individual and team sports
- Promote Paralympic sports to all

This presentation will provide an insight into how we can use Paralympic/Disability sport in a PE/APA programme to include all and work to embed it into the everyday curriculum across multiple settings. The concept of Paralympic education was developed via a programme called “Ability v Ability” and was delivered via School Sport Partnership programme which is now called “School Games Organisers programme” in the UK, as well as direct deliver via teachers and teaching assistants. This project is supported by a DVD and interactive web site www.abilityvability.co.uk

One of the main outcomes over the last three years has been a substantial increase in Paralympic Education due to the “ability v ability” programme and also in part due to the London 2012 Games “Get Set” programme. Schools in the UK are now starting to see how and in what format they will continue this as part of the Paralympic Education legacy. The question which comes clearly out of this work is: Is Paralympic/Disability Sport still seen as sport that is for people with disabilities only or is it seen as sport, which can be played outside the Paralympic arena by all?

Martin Mansell

Providing Opportunities For People With Disability In Sport And Physical Activity – Who Makes It Happen?

On the face value, creating opportunities for people with disability to participate in sport and active recreation is easy. It’s essentially the same as for anyone. You make the activity fun, exciting, competitive and rewarding and people will turn up and want to come back for more. Sometimes it is that easy. But sometimes it isn’t. While programs and services for people with disabilities have become more and more sophisticated there are still very real challenges to participation.

In this presentation we will explore the critical human characteristics that contribute most to new opportunities in sport and active recreation for people with disability. Based on 25 years experience in the field I will outline the personal characteristics and personality types that, when combined, can create multiple opportunities for participation. If we are able to recognize who makes it happen not what makes it happen, then it becomes easier to provide sustainable opportunities in the long term.

Peter Downs

S27

Enhancing Power and Speed in Youth: New Insights

Oliver, JL*1; Meyers, RW*1; Lloyd, RS*2; Rumpf, M*3; McMaster, DT*3

1Cardiff Metropolitan University, United Kingdom; 2University of Gloucestershire, United Kingdom; 3AUT University, New Zealand
Enhancing Power and Speed in Youth: New Insights.
The aim of this session is to present and discuss the findings of the most recent research into the development of speed and power in youths. Although the development of some fitness components in youth (strength, aerobic fitness), have been researched more extensively, there is a relative lack of research into the development of speed and power. Speed and power are fundamental to success in many sports and therefore contribute to future competitive achievement and enjoyment in childhood and beyond. Both speed and power are multi-factorial and the underlying factors which limit their expression are likely to be affected in a variety of ways by both development (i.e., growth) and training. The presenters in this session represent a group of emerging researchers in this area that are members of the STAR Sports Alliance, a collaboration of researchers studying long-term athlete development.

Jon Oliver

The Development of the Stretch-Shortening Cycle in Youth Athletes
The presentation by Dr Lloyd will focus upon the development of the stretch-shortening cycle in youth athletes, providing original data on the natural development of these characteristics throughout childhood and adolescence. Data from large-scale field based studies and well as laboratory based assessments of muscle function (EMG) are provided to highlight the periods of natural development.

Rhodri Lloyd

Lower Body Force-Velocity-Power Profiling in Youth Athletes
Mr McMaster’s presentation continues the theme of power development in youth by reviewing lower body force-velocity-power profiling in pre-pubescent, pubescent and post-pubescent males. Furthermore he provides evidence of the effects of strength training on the force-velocity-power profiles of these three maturation groups.

Travis McMaster

Speed Development in Youth Athletes
The presentation by Mr Meyers then diverts the focus towards the speed development in youth. The data presented from cross-sectional and longitudinal field based assessments provides an insight into the natural development speed and sprinting kinematics from pre-pubescence through to post-pubescence, whilst highlighting the influence of chronological age and maturation upon speed.

Robert Meyers

Kinematics and Kinetics of Maximum Running Speed in Youth Athletes
The presentation by Mr Rumpf continues the focus of speed development by presenting laboratory work utilising a non-motorised treadmill to investigate the kinematics and kinetics associated with maximum sprint velocity in male youth participants. The importance of certain kinetic and kinematic variables in the development of maximal speed will be discussed in reference to maturation.

Michael Rumpf

Coaching as a Moral Enterprise: Reflective Practice and Experimental Philosophy
In the academic literature on sports coaching it is argued by some that good ethics is not only important, but central to the development of good practice (Hardman, Jones & Jones, 2010; Hardman & Jones, 2011; Loland, 2011, Standal & Hemmestad, 2011). Coach education programmes pay increasing attention to ethics, welfare and codes of conduct. Often, however, coach education strategies, particularly at the foundational stages, convey the moral dimensions of coaching through methods that extract ethics from how coaches actually encounter moral issue in their coaching practice. The result for coaching practice, I argue, is that hypothetical discussions on what to
do in real or pretend moral issues both lack transferability and the central importance of the moral dimension of sport coaching fails to be embraced. In this presentation, I argue that the development of coaching ethics in coach education programmes should be grounded in coaching practice. I argue that this requires sports coaching to be understood in terms of phronesis — the Ancient Greek idea that in addition to requiring theoretical knowledge and technical know how, it is a practice that requires good judgment. I then argue for a normative ethics of sports coaching grounded in the processes of reflective practice and immanent criticism. The presentation then discusses some methodological issues and preliminary findings related to two case studies involving sub-elite level coaches of an individual and team sport.

Alun Hardman

Coaching, Ethics, and “Experimental Philosophy”
In his book “Experiments in Ethics” (pbk Harvard/2010), philosopher Kwame Anthony Appiah explores how empirical science may inform our discussions of ethics. In the vein of what has been called "experimental philosophy," this presentation focuses on how the sciences may helpfully illuminate our thinking about moral psychology and decision-making in the practice of coaching. Among the considerations that may fruitfully inform our thinking about coaching are discussions in neuroscience and cognitive science about factors that operate outside of conscious awareness but that nevertheless influence decision-making. In this regard, neuroscience is engaging in important conversations about the emotions, while cognitive science is exploring the role of heuristics in decision-making. An exploration of these issues in connection with coaching may help shed light on how unconscious factors may both help and hinder ethical decision-making in coaching practice. In addition, an awareness of the role of such factors may help coaches anticipate and reduce distorted forms of communication with athletes.

Jeff Fry

Cruel to be Kind: Caring coaches.
Coaches of modern day professional sport are often faced with questions about the moral impropriety of their players. Players accused (and found guilty) of racism, homophobia, violence, excessive alcohol consumption are generally defended by the coach unless certain lines are crossed or marks overstepped. Loyalty within a team seems a crucial instrumental virtue for team success and harmony; however, the coach might be left defending the indefensible for the sake of unity. In this paper I explore the limits of acceptable tolerance and the choices available for coaches and clubs when faced with bad behaviour. I argue that in some cases, the coaches and clubs have a duty to act in a more robust fashion which paradoxically might in the long term be beneficial to the player also. This means taking seriously the player’s behaviour by punishing them appropriately, but also showing a commitment to the player’s character and well being by providing appropriate rehabilitative intervention opportunities.

Carwyn Jones

S35

Performance Data Management and Analysis – Developing coach and Athlete Understanding
Robson, SJ*; Forrest, LJ*; Murray, AM*
sportscotland institute of sport, United Kingdom

Athletes and coaches are often reliant upon, but unaware of, the data management processes underpinning performance. Facilitating informed choices to athletes and coaches is one of the roles of the multi-disciplinary support team. This can be better achieved through collecting, analysing and interpreting data through a fully integrated data management system.

One of the goals at the sportscotland institute of sport is using data to drive integrated and objective decision processes, with the end goal of improving performance. This presentation will discuss the data management system and techniques used by practitioners at the sportscotland institute of sport. Historically, the challenge has been collating information into one location in order to analyse and visualise inter-related, yet distinct, data sets. We will discuss the journey which resulted in the development of a system that now
enables shared visibility of information. This allows the coach along with the multi-disciplinary support team to generate questions relating to decision making and future planning. Answering these questions encourages engagement, sharing and communication between athletes, coaches and their support staff. The outcomes of which can create measurable changes in performance. We will demonstrate our processes using the specific examples of the female athlete and swimming.

Conceptual Overview
It is argued in this symposium that ‘Sport Pedagogy’ (or ‘Sport & Exercise Pedagogy’) is a foundational (sub) discipline that should inform professional practice in physical education and sport coaching. Sport pedagogy is located in the academic territory between education, sport, and sport/exercise sciences. Researchers focus on the needs of diverse learners of all ages in physical activity and sport settings, the abilities of professional teachers and coaches to meet those needs, and the contexts in which sport policy and knowledge are developed and delivered. The contribution of sport pedagogy to sport theory and practice is critically assessed.

Kathleen Armour

Advanced Sport Pedagogy in a European Context.
The EU Sport Unit has highlighted the societal and educational role of sport as one of the central research topics for its new research agenda. The need for EU citizens to learn and develop continuously across the life course is regarded as pivotal. In this regard, Europe can seek to enhance lifelong health and wellbeing through the development of effective and ‘portable’ sport/physical activity/health pedagogies. It is argued that through pedagogic innovation, teachers and coaches can contribute to quality of life – and economic competitiveness – in a period of economic contraction and instability.

Fiona Chambers

Sport Pedagogy and Questions about Learning
One important challenge ahead for sport pedagogy researchers is to consider afresh challenging questions about learning. Learning in the fields of sport, physical activity and physical education is a particularly complex business, since most existing theories of learning are defined cognitively. Learning in sport is, however (to a large extent) practical and embodied, and it is not just an individual affair but is closely linked to the wider cultural contexts of sport and related areas such as health. This paper will critically review notions of learning process, direction and content as key concerns for sport pedagogy researchers.

Mikael Quennerstedt and Marie Öhman

New Research Programmes in Sport Pedagogy
The field of sport pedagogy is reaching a level of maturity and critical mass. Looking ahead, however, it is argued that researchers should focus on crossing traditional boundaries in order to ensure they are able to answer questions that are relevant to sports participants. Specifically, future research programmes should be developed that are (i) practice-referenced, (ii) relational and (iii) interdisciplinary. It is only by developing such programmes that sport pedagogy researches can serve society by informing and enhance sport and exercise participation across the life course.

David Kirk and Leen Haerens

Discussant: Clive Pope
Today’s sports practitioner and coaching graduates are expected to learn more technical skills at a faster rate than ever before. And yet in most cases, technical skills alone are insufficient to place graduates in a strong position for that vital first job in elite sport. Employers are also looking for the ‘soft’ people skills that enable graduates to make an impact when they are applying their technical excellence (Coll & Zegwaard, 2006). Some academic institutions help to equip their students with soft or generic skills (Barrie, 2006) through initiatives such as work experience and integrated learning programmes. Some employers also assist by providing a stepping-stone for students with sponsored post-graduate studentships. In addition, the UK Home Country Institutes of Sports have developed fast-track development programmes to help new employees acquire the generic skills needed for success in the elite sport environment (Cassidy, 2010). Some sports also provide similar programmes for their prospective elite coaches. This session looks at the application of an integrative learning model within these development programmes, whereby a range of informal and formal learning activities enable new employees to accelerate their contribution to the support of elite sport. This session also explores ideas on how academic courses can promote generic skills at an earlier stage of development.


of their identity formation/development process? What might be the consequences of a coach “hanging onto” their athlete identity and not developing an alternate identity as a coach?

Clifford J Mallett

Integrated Coach Development: A Systems Approach to Elite Sport Coach Development

The traditional focus of coach developmental efforts has been on changing individual coach attitudes, knowledge, and behaviors (Trudel & Gilbert, 2006). Despite decades of formal coach education initiatives around the world, there is little evidence that these efforts have resulted in more effective coaching (Trudel, Gilbert, & Werthner, 2010). A review of literature across related domains such as education and business shows that similar individual level change efforts have also been largely ineffective (Liker & Meier, 2007; Stigler & Hiebert, 1999). Instead, there is an emerging body of evidence showing that individual development is optimized when it is nested within a systems level development effort (Ermeling, 2010; Gilbert, Gallimore, & Trudel, 2010; Rother, 2010; Saunders, Goldenberg, & Gallimore, 2009). A systems level approach recognizes that coach development is fundamentally connected to athlete and program development; all three levels of development are integrated and targeted simultaneously in an effort to create and sustain learning systems. The purpose of this presentation will be to share an overview and evidence for a systems approach to continuing professional development for sport coaches. The presentation will include examples of tools for measuring development across the three integrated levels (coach, athlete, program) and an illustration of continuous improvement principles in action based on ongoing research with coaches of elite and developmental level athletes.

Wade Gilbert

The Paradox of Helping Elite Coaches Develop: Designing a Program that is Time and Cost Effective that is Consistent with the Research on How Coaches Learn

Contemporary coaching educators must find ways to provide highly customized educational programs that leverage experiential learning, provide opportunities for interacting with and learning from other coaches, and help coaches reflect on these experiences while at the same time being cost effective in terms of time and resources. The U.S. National Wrestling Coaches Association Coaching Leadership Academy (CLA) program will be presented as one possible model that can be used to help meet the current educational needs of elite coaches in a cost- and time-effective manner that is consistent with the latest research on how coaches learn. The CLA was designed to improve the leadership capabilities of collegiate coaches with the goal of providing them with broad-based knowledge that will help strengthen their programs, especially off the mat and in doing so stem the tied of universities discontinuing wrestling as a varsity sport. Program components include: (1) a pre- and post-program 360 degree coaching leadership assessment; (2) completing 10 online learning modules and accompanying workbook covering topics such as marketing, fund raising, health and safety, and developing the wrestler as a person; (3) participation in a 2 day in-person workshop where participants learn from experienced coaches, experts, and each other in a highly interactive format; and (4) individual work with a mentor coach for the year following the in-person workshop. How the program ties to current coaching education research (e.g., Trudel & Gilbert, 2006; Trudel, Gilbert & Werthner, 2010), barriers to developing the program, and its strengths and limitations will be discussed.

Daniel Gould

Elite Coaches’ Own Safe Space for Reflective Learning: The Role that a Personal Coach can Play

The differences between having 10 years of coaching experience and 10 times one year of coaching experience is reflected mainly by coaches’ ability to reflect on their practice. Nevertheless, it is important to consider what are the most appropriate situations for coaches to enter into a reflective process and nurture their creativity. Using the literature on (a) lifelong learning, (b) reflective practice, (c) executive and life coaching, and d) my own training and experience as personal coach, the goal of this communication is to explain how the interactions (sustained or punctual) between an elite coach and a personal coach can create a safe space for “for exploration, discovery and true learning to take place as the learners face their professional and personal challenges” (Parsloe & Leedham, 2009, p. 25). For the interactions to be more than an interesting conversation between two individuals, both actors need to fully invest themselves. Elite coaches have to take responsibility for their own learning by allotting time for meetings and acting on agreed requests for development. To play an efficient role, personal coaches have to be
trained and qualified because these type of conversations are very specific “ and not everyone...is used to having the patience and skills to help people learn in this way” (Parsloe & Leedham, p. 9). Parsloe, E. & Leedham, M. (2009). Coaching and mentoring: Practical conversations to improve learning. London, UK, Kogan Page.

Pierre Trudel

Physical Education Curricula for Future Generations: Global Patterns? Global Lessons?

Doune Macdonald

Is Global Neo-liberalism Shaping the Future of Physical Education?

Globally, school physical education (PE) is at a cross-roads as schooling increasingly seeks to value and measure students’ performances that will ultimately contribute to economic prosperity. Alongside this performance regime is the valuing of individual responsibility and market choices consistent with what has been termed global neo-liberalism. Consequently, in many countries, PE curricula are accountable for the generation of responsible citizens who are physically fit, sports-playing, socially connected, health literate and economically productive. Each of the speakers in this symposium will briefly introduce their countries educational context and raise where they believe the PE curricula should be heading and why. Our discussant, Professor John Evans, will try to make sense of these national trajectories in the light of international policy trends.

Clive Pope

The Jagged Edge and the Changing Shape of Health and Physical Education in Aotearoa New Zealand

While Health and Physical Education (HPE) has retained its status as a component of the most recent National Curriculum, a casting eye across the education landscape would reveal changes that are having direct and indirect influences on the subject. The two most significant changes fall under the rubric of provision. First, recent Government strategy has seen the amalgamation of Colleges of Education with Universities and an associated pressure to rationalise professional programmes to academic options. For many teacher educators this widespread re-ordering of job descriptions, coupled with institutional responses to a national drive toward literacy and numeracy attention, has placed several HPE initial teacher education programmes in quite precarious positions. The second influence on provision has been the marked appearance of agencies and organisations that have assumed delivery of curriculum and co-curriculum within many schools. While some of these providers are commercial others are community-based agencies with varying ideological agendas. These acknowledged changes, among others, are cutting away at the political and professional autonomy (read shape) of HPE.

Kicheon Lee

The Korean Physical Education National Curriculum: a Shift from the Edge to a Central Subject

The Korean national curriculum has been reformed seven times with a 6-8 years interval, including the 7th curriculum which was developed in 1997, and implemented at schools from the year of 2001. The curriculum change has been driven by national and social needs to teach students systematically in line with general education’s philosophical and theological themes. In turn, the main theme for the 7th curriculum is that of a “differentiated curriculum”. The intention of the differentiated curriculum was to eliminate educational inequality and the major characteristics of this for PE were three-fold: a physical activity, values-based approach; cross-curricular approaches in elementary school; and elective subjects in secondary school. Now fifteen years have passed since the inception of the new curriculum and research suggests: physical education (PE) is still being regarded as a minor subject compared with others; the PE curriculum’s major philosophy and principles are heavily based on western concepts; and lastly, many students are still physically unfit and passive in their daily life. Now we are at a cross-roads and PE needs to refocus moreso on a fundamentals-based approach.
Re-Thinking the Place of PE in American Schooling

As the United States enters the second decade of the 21st century, it does so in a polarized political, social, and educational climate heretofore unseen in its relatively short history. Such a climate has implications for how physical education (PE) may need to reinvent how it contributes to the schooling of American children and, ultimately, the well-being of the nation. Currently, PE receives much “moral support” from the public and politicians yet little in the way of policy and financial support from policy makers at the national, state, and local levels. This presentation proposes a rationale for and a plan for PE to reposition itself in the school curriculum so that it can make contributions (perhaps even more that it currently does) and remove itself from the divided debate on what public schooling should include and how it should be provided.

Bryan McCullick

Development and Transition of Physical Education in Germany

The present discussion concerning physical education (PE) in schools has become overshadowed by the general debate on the quality development of instruction in school which drives the present political efforts. In view of the poor results of German school students in the international performance comparison studies, efforts are being made for improving the quality of education regarding the “learn result”. In this context, administrative control efforts are increased by again restricting the freedom for decision of the individual schools which had been granted at the end of the 20th century. The most obvious proof of this development is seen in the introduction of educational standards and competencies in curricula. The purpose of this presentation is to discuss the problems of standardization in the PE curricula and the central characteristics of current curriculum concepts in Germany. Although the concept of “educational physical education” has been established in a majority of PE lesson plans, it becomes apparent – in connection with the standards debate – that questions surrounding the conceptual direction of lessons in PE are being raised.

Günter Stibbe

Public Policy and Physical Education in Post-Colonial Africa

The development and promotion of physical education (PE) in post-colonial Africa is dependent on public education policy. The critical factors that influence public policy initiatives, frameworks and corresponding reforms include triple cultural heritage (indigenous, Islam, and Western), Europeanized discourse, and stratification of school subjects, public school expenditure, and teacher training. Policy processes and enactments involve government officials and scholars, whose education and cultural understanding of education is grounded in westernized ideological orientations and beliefs. Islamic Africa influences different aspects of education, which impacts PE curriculum and practice. Indigenous African games and sports were devalued, leaving the school curriculum to be a contested terrain in many ways. The purpose of this paper is to discuss critical factors that influence PE curriculum and practice in post-colonial Africa, as well as suggest policy innovations or initiatives that encourage inclusivity of perspectives, inculcate new knowledge on paradigm shift in school subject stratification, address the disconnect between different ethnic populations in schools, promote excellent curricular innovations and educational practices, and curb overweight and obesity rates evident in cities across Africa.

Professor Rose Chepyator-Thomson, University of Georgia, USA

Discussant
Professor John Evans, Loughborough University, UK

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The ISAK Method of Measuring - A Practical Demonstration
Stewart, AD; Smith, P*; Riach, I*; Fawkner, S*; Fawkner, S*
1Robert Gordon University, United Kingdom; 2Glasgow Caledonian University, United Kingdom; 3SportScotland Institute of Sport, United Kingdom; 4Edinburgh University, United Kingdom

There is more to making anthropometric measurements than is commonly appreciated. In this practical there will be demonstration of a range of techniques, beginning with how to approach and landmark the participant. In
2011, ISAK produced its new manual, which represented minor revisions to its protocol which remained unaltered since 2006. Three new measurements were added to make a full protocol of 42 measurements. In this practical there is the opportunity to observe, participate and learn from experienced ISAK practitioners using the best equipment available, and be involved in measuring a range of variables on our volunteers. This is a genuine hands-on session, where both experienced and those new to measuring will be welcome to participate.

Pam Smith, Irene Riach, Samantha Fawkner

Development of a Structure for Research Methodology in Sport Science
Haag, H*; Mess, F**; Toriola, A*; Holzweg, M*; Kluka, D*; Lopez de D’Amico, R*
1University Kiel, Germany; 2University Konstanz, Germany; 3Tshwane University of Technology, South Africa; 4Humboldt University, Germany; 5Barry University, United States; 6Universidal Pedagogica Experimental Libertador, Venezuela

Purpose
The purpose of the workshop can be summarized in the following way:

• Present and discuss one model for research methodology.
• Implement aspects which guarantee a holistic view for research methodology which is especially needed for the multidisciplinary field of sport science.
• Present a model with a clear research logic by following a six-step approach.
• Make clear that knowledge and expertise in regard to research methodology is necessary for consuming (reading and understanding) research and for being active part of a research process.

Content
• Philosophical Foundation: Philosophical foundations of science and research. Examples for epistemology positions and for scientific theories. Holistic perception of research (Herbert Haag).
• Research Methods: Short introduction into the following three research methods: description, correlation, experiment (Filip Mess).
• Research Designs: Overview of different steps in research design and presentation of aspects for qualitative research design (Abel Toriola).
• Techniques of Data Collection: Introduction into questioning, observing, testing and content analysis (Martin Holzweg).
• Techniques of Data Analysis: Overview to selected statistical and hermeneutical concepts (Darlene Kluka).
• Transfer-Theory-Practice: Discussion about practice guided theory and theory guided practice. Presentation of possibilities for transfer (Rosa Lopez de D’Amico).

Procedure
• The six content areas will be presented and supported by material to be distributed.
• A summary will be given with a final round of question-answer period to the six workshop organizers.

References
Perspectives On Practical Aspects of Physical Literacy
Maude, PM*; Taplin, E; Almond, L*; Whitehead, M
1University of Cambridge, United Kingdom; 2University of Plymouth, United Kingdom; 3N/A, United Kingdom; 4University of Bedfordshire, United Kingdom

Physical Literacy and the Young child
The first paper will focus on physical literacy and the young child. The concept of Physical Literacy will be explored in the context of young children as they develop and learn. The working definition of Physical Literacy describes a physically literate individual as one who has the motivation, confidence, physical competence, knowledge and understanding to maintain physical activity throughout the lifecourse. Reference will be made to children’s physical growth, their movement development and the achievement of physical competence in the early years. The importance of active play in sensori-motor development and the importance of this sensori-motor development as a precedent to cognitive, social and emotional development will be discussed as children embark on their physical literacy journey.
Patricia Maude

Physical Literacy as a personal journey
The second paper will consider the notion that physical literacy can be seen as a personal journey that is ongoing from cradle to grave. Physical literacy is not a capability that is achieved at a particular time and then persists throughout life. All can achieve physical literacy. There are no benchmarks that have to be reached. Each individual will be on their own physical literacy journey, which will be unique. The paper will be illustrated by examples of personal physical literacy journeys.
Liz Taplin

Physical Literacy and a pedagogy of engagement
The third paper will focus on physical literacy and a pedagogy of engagement. This presentation will identify the central components of physical literacy and demonstrate how the process of engaging with individuals is the key to the assimilation and accommodation of important messages associated with developing a commitment to a physically active lifestyle. The key features of physical literacy need to be made accessible to the unformed and uninformed minds of young people as well as adults, whose ability to evaluate life plans and make choices about what to do with their lives is not yet developed or may not have been considered. By establishing this link and outlining how pedagogues need to work with individuals of all ages, the presentation will provide a comprehensive framework to guide practice.
Len Almond

Physical Literacy, ‘reading the environment and the importance of encountering different environments in the promotion of physical literacy.
The final paper will look at the attribute of a physically literate individual who is described as perceptive in ‘reading’ all aspects of the physical environment, anticipating movement needs or possibilities and responding appropriately to these. It will be proposed that realisation of this attribute involving effective interaction with the world is at the heart of physical literacy and aligns with Existential views. The commitment to developing effective interaction impacts on the nature of experiences in physical education and it is to the issue that the paper will finally turn.
Margaret Whitehead
Mixed Emotions: Understanding and Managing Students’ Emotions in Study and Sport
Lavallee, D*; Jones, M; Martin, T; McCarthy, P*; Mark, H; Cumming, J; Duda, J; Lane, A; Devonport, T
1University of Stirling, United Kingdom; 2Staffordshire University, United Kingdom; 3Glasgow Caledonian University, United Kingdom; 4University of Birmingham, United Kingdom; 5University of Wolverhampton, United Kingdom

Mixed Emotions: Understanding and Managing Students’ Emotions in Study and Sport

Introduction
Emotions pervade the lives of student-athletes. Trying to achieve in sport and education, while balancing the competing demands of these challenging environments can give rise to strong emotional responses. Because emotions relate to performance and participation understanding and managing students’ emotions in study and sport is a worthy endeavour with meaningful outcomes. The objectives of this symposium are twofold; firstly to provide an overview of the diverse research activity in this area, and secondly to provide a forum to discuss issues pertinent to the study of emotions as they apply to student-athletes.

Andy Lane

Exploring how student athletes respond to demanding performance settings
We report a series of studies exploring how student athletes respond to demanding sporting and academic settings using the Theory of Challenge and Threat States in Athletes (TCTSA: Jones et al., 2009) as a framework. Data were collected on student athletes’ self-efficacy, perceived control, achievement goals, emotions and cardiovascular reactivity. The relationship between the cognitive approach to demanding performance settings and emotional and cardiovascular responses are discussed, with suggestions provided on the most adaptive way to think about important upcoming sport and academic events. Other research examines the link between academic and sporting stressors, and in particular an increase in academic-related stress following sporting injuries. Findings will be discussed in relation to reciprocal effects of sporting and academic endeavours.

David Lavallee, Martin Turner and Marc Jones

Do induced positive emotions improve concentration?
The skill of concentration in achievement settings such as exams and sport is exposed to the vicissitudes of intruding emotions. Paradoxically, this vulnerability is also a strength because if emotions influence concentration, it should be possible to induce emotions to support concentration (Fredrickson, 1998). In Study 1, 45 student-athletes were randomly assigned to one of three emotion conditions (positive, negative, neutral). Emotions were manipulated using film clips; then participants completed the concentration grid task. Those experiencing positive emotions performed statistically better on the concentration grid task than those experiencing negative emotions. In Study 2, the same emotions were induced using classical music among 20 student-athletes. They completed the Stroop task in a counter-balanced repeated measures design. Participants in the positive emotion condition had faster response times than the negative and neutral emotion conditions. Inducing positive emotion using music or film might be a functional technique to improve concentration among student-athletes in achievement settings.

Paul McCarthy

Developing emotional and attentional control in young student-athletes through sports participation
Sport is an environment considered to provide experiences which can facilitate the development of life skills and thus foster well-being in student-athletes. It is assumed that these skills transfer to other domains of the student-athletes’ life, however, whether this indeed occurs has rarely been investigated. To address this gap in the literature, the present study examined the extent to which student-athletes’ development of attentional control and emotional control through sport transfers to the academic domain. The 419 participants were aged between 15 and 18 years and completed questionnaires assessing emotional control and attentional control in both sport and school contexts, positive youth experiences in sport, and indicators of well-being (e.g., general self-worth). Results showed significant relationships between positive youth experiences, attentional control and well-being. Emotional control revealed a mixed pattern of findings. This talk will focus on the issues faced while measuring emotional regulation and how we can ensure sport environments positively influence participants’ capacity to
regulate their emotional state.
Mark J. G. Holland, Jennifer Cumming, and Joan L. Duda

Emotion and coping in student athletes
In the United Kingdom, an increasing number of talented athletes are choosing to combine high performance sport with higher education. A key feature of the student-athlete experience is the simultaneous pursuit of personally meaningful goals in athletic, academic, social, and sometimes work domains. The interactional and reciprocal nature of these ongoing demands may strain an athletes’ resources producing a range of emotional consequences. As such, teaching student-athletes strategies to cope with such demands is of particular importance to sport psychology practitioners (Devonport, 2007). The present study profiles a holistic approach toward the teaching of coping skills that not only seeks to manage stress and emotions, but also facilitate the achievement of personal goals across domains thereby promoting balance. This approach may encompass the broader needs of student-athletes and help facilitate lifelong success.
Tracey Devonport

The Expert-Performance Approach: Understanding and Enhancing Coaching Effectiveness and Learning
Despite there being a large number of sports coaches who have an undoubted effect, there is still some debate as to what constitutes effective coaching and how it is acquired. The Expert Performance Approach is a framework used to understand and enhance performance, its underlying mechanisms and its acquisition in complex and skilled tasks, such as sports coaching. In this presentation, the framework will be outlined and relevant coaching literature reviewed with respect to it. The review will include detail of performance in coaching, its underlying mechanisms, such as the role of knowledge structures, and its measurement. It will also include information on how coaches acquire the behaviours and knowledge necessary to be effective. Acquisition processes such as deliberate practice, reflection, coach education and observational learning will be discussed. New research applying the framework to coaching will be presented. Practical implications will be outlined regarding the measurement and education of coaches.
Paul R. Ford

Coach Behaviour Analysis: Developing Practice and Coach Effectiveness
Coaching effectiveness hinges on an alignment between coach behaviour, practice type, and context, as well as the athlete’s development and specific needs. This presentation considers research that both describes coaching behaviour and practice structure, and identifies the “how” and “why” of these behaviours during different practice types, establishing what cognitive processes underpin specific behaviours and practice in context. The presentation considers the nature of coach self-awareness and coaches’ epistemological gap, that is, the gap between
understanding and practice, knowledge and action. The presentation illustrates how coaching practice can be
guided by research evidence rather than uncritical inertia and how exploring the underlying assumptions and
explanations for coach behaviour offers a way for practitioners to challenge their practice, move from a practice
“comfort zone,” and open up to self-reflection. Lastly, the presentation illustrates how behavioural analysis using
computer technology can be used as a scaffold for coach reflection and to identify coach learning needs.
Chris Cushion

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PAR and (indigenous) Knowledge Production in the African Context of Sport
Amusa, LO*; Toriola, AL*; Hollander, W*; Burnett, C*; Ogunniyi, CL*
1University of Venda, South Africa; 2Tshwane University of Technology, South Africa; 3University of Johannesburg,
South Africa

The contextualisation and publication of indigenous knowledge in Africa: The African Journal for Physical, Health
Education, Recreation and Dance (AJPHERD)

The African Journal for Physical, Health Education, Recreation and Dance (AJPHERD) is a peer-reviewed journal
established to achieve the following objectives: (1) provide a forum for physical educators, health educators,
specialists in human movement studies and dance, as well as other sport-related professionals in Africa, to report
their research findings based on African settings and experiences, and also to facilitate mutual exchange of ideas
among African professionals; (2) afford the professionals and other interested individuals in these disciplines the
opportunity to learn more about the practice of the disciplines in different parts of the continent; and to (3) create
an awareness to the rest of the world about professional practices in the disciplines in Africa. AJPHERD has been
published consistently since it was launched in 1994. Two issues were initially published annually from 1995-2001;
which was subsequently increased to four issues per annum. The Africanness of the journal is reflected in a
number of features and issues: cover design, focus on indigenous African games, activities and sports (e.g.
activities of the Africa Association for Health, Physical Education, Recreation, Sport and Dance: AFAHPER-SD, and
those of Dr Peter Wanderi which led to the formation of the Traditional and Indigenous Games Federation in
Kenya), rejection of African studies by foreign journals; focus on improvements and standards of teaching Physical
Education in African schools, publication of researches done in Africa on African athletes by Africans (e.g. at the All-
Africa Games in Harare, Zimbabwe, 1995; Johannesburg, South Africa, 1999 and Abuja, Nigeria, 2003), formation
of Society of African Journal Editors (SAJE) in 2005 in Nairobi, Kenya, as well as the focus on African Physical
Education and sport professional bodies in west, southern and east Africa. The discourse also covers other
pertinent contemporary issues and contributes to the debate concerning the need for preservation and
propagation of indigenous knowledge in Physical Education, physical activity and sports in Africa.
Lateef O. Amusa and Abel L. Toriola

Synthesizing social and managerial science in sport for development methodology
The SˑDIAT has gained international recognition as evidenced in academic publications and report overviews. Yet,
the strength and synthesis of paradigms brought a new dynamics to programme evaluation within the framework
of strategic management and delivering sport for development programmes for optimal social impact. The
instrument design and implementation will be discussed based on extensive case study analyses of the GIZ/YDF (a
youth development through sport programme) that was implemented since 2007 in 9 African countries. The main
findings relate to causal relationships between programme management and delivery, and various programme
design principals, stakeholder involvement to meet requirements of sustainability and multi-leveled social impact
according to pre-designed indicators. The increase in instrumental sophistication provide a basis for the
meaningful synthesis of reporting on Indicator Monitoring Scores that dovetail with required qualitative data to be
collected and methodological refinement.
Wim Hollander

PAR and (indigenous) knowledge production in the African context of sport
This paper draws on more than a decade of research into indigenous knowledge systems linked to sport, games,
dance and sport for development within the African context. By exploring Participatory Action Research as an empowering tool to establish reciprocal agency between researcher and research participants, the research process is scrutinized. Following an inductive and grounded theoretical approach, an indigenous conceptual framework emerged around central themes. In the first instance, it is shown how the 'doing of research' impacts on research participants and their social worlds, and in the second instance, social concepts are formulated that holds explanatory meaning in addition to broader sociological theories and conceptual frameworks. Emerging concepts based on indigenous knowledge and practices are thus utilized for interpretation of results of four selected case studies. The community 'uptake' is discussed relating to i) the national School Sport Mass Participation Programme (gender dynamics), ii) Jag Foundation’s Mighty Metres Programme (power relations and group dynamics), iii) the Australian Sport Outreach Programme (community engagement) and iv) GIZ/YDF (German Development Cooperation's Youth for Development through Football Programme) (stakeholder dynamics). The central theme of power relations and reciprocity is embedded in the core of collaboration and strategic partnerships for individuals and groups in various African contexts of chronic poverty.

Cora Burnett

Comprehensive case studies Conducting in-depth research to triangulate data collection

Traditional ethnographic research involves living in a location for at least a year and being submerged into the local customs, culture, language and life. In the 21st century, researchers are pressured to complete research in less time for less cost which often leads to incomplete data collection and a lack of contextual understanding. Conducting comprehensive case studies and living close to the context may be a possible solution that satisfies both ends of the methodological spectrum. These case studies provide a foray into 'thick descriptions', as Clifford Geertz (1973) describes them, to be able to try and understand the social understandings of actions, words and decisions made. Delving into the perspectives of multiple people as well as being intimately involved in the field of study for a length of time provides deeper insights into the subject matter than a short month or even six-month research period. Case studies themselves imply a comprehensive procedure; however the methodological difference in this approach is more closely related to the traditional ethnographic practice of getting multiple perspectives on the same topic. Used for collecting data for PhD research and sport for development impact studies, this technique selects and interviews individuals based on a certain criteria (i.e. a team member of the focus study). Going two steps further, additional interviews are conducted with the individual's significant others, including their teacher, coach, parent/guardian, sibling and/or friend. This provides a rich story surrounding the individual and builds a strong case study of triangulated material from a variety of perspectives, levels of hierarchy and familiarity with the subject. Within the variety of stories, contradictions may arise, while other aspects of the life and habits of the individuals and family members are confirmed. If, according to Geertz, 'cultural analysis is intrinsically incomplete' (1973:29), it is our job as researchers to try and portray the most complete picture possible with as much information and understanding from a local perspective as possible.

Cassandra Ogunniyi

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Coaching As A Profession

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Professionalization of the sports coach: a call for a sense of direction

The paper will attempt to foreground and problematise a number of issues that the coaching communities need to consider in its journey towards professionalization. While there continues to be domestic aspirations (North, 2009) for a professionalization of the UK workforce and an international call for coaching to be valued as a profession (ICCE), there is little apparent real progress on the direction in which this professionalization process is moving. If we settle for a mixed provision approach with both a volunteer base and an increased professional sector, how is that to be delineated, to what degree will there be a natural occupational pathway from one to the other, and is this mixed market to be seen across all sports and coaching and across all domains? (Taylor & Garratt, 2012) While most of the debate has been introspective, we still need to consider the way coaching as an emerging profession is
Does sport coaching really want to be a profession?
This short paper will explore such questions as ‘What is a profession?’ Can and should sport coaching really be a profession in the traditional sense? What can we learn from traditional professions as well as those in sport and physical activity contexts who are striving to be a profession? Most of the literature approaches the nature of the profession through a range of values, attributes, specialist knowledge, education and ethics (for example, Cruis et al 2004; Williams 1998; Duffy et al 2010) and more rarely, as an interacting network of institutions and people (Khurana 2010:1). The criteria and benefits of a profession will be explored, alongside health warnings from research on some traditional professions (Kennedy, 2005; Sommerlad et al., 2009, 2010; Duffy et al., 2011).
Reference will be made to debates and initiatives on professionalization or professions in sport contexts (Whitson and McIntosh 1993; Smith and Westerbeek 2004; Taylor and Garret 2010; Hylton and Hartley 2012).

Professionalising practice in sports coaching
Professionalisation is part of the current discourse in sports coaching. While the professionalisation of occupations can largely be traced to the desire of the government apparatus to control public sector occupations in terms of training budgets, recruitment quotas, targets for performance, and so on, this does not apply to sports coaching, and the demand, if there is any, is therefore ‘internal’. This short presentation argues that there is merit in focusing on the professionalisation of practice (Evets 2003, 2010), in contrast to the whole occupational grouping and infrastructure of coaching being described (by any uncontested criteria) as a profession. It would be desirable to set limits on the professionalisation of practice by identifying ‘quality’ criteria and even some pre-requisites (education and training), although not necessarily formal education courses. This raises interesting issues about volunteerism (which would not be negated in this interpretation), but some roles/domains may be incompatible with ‘acting like a professional’. Becoming a profession is not a matter of self-determination; the government apparatus needs to see the benefit of applying funding controls, the importance of acknowledging (relatively) unrestricted practice, or reacting to crisis of public clamour when things go wrong. None of this applies to sports coaching, although this is strange given the close association with the interests of young people (and, perhaps, national sporting success). Mechanisms such as registration, accreditation, licencing, and so on, can be taken out of the ‘profession’ debate, but still be central to the recognition of ‘professional-like behaviour’. The challenge is to exert sufficient leadership to ensure that we make progress along this road.

Sport Coaching as a blended professional area
A recent position paper in the International Journal of Coaching Science (Duffy, Hartley, Bales, Crespo, Dick, Vardhan, Nordmann and Curado, 2011) has argued that the International Council for Coach Education (ICCE) should shift its focus from the positioning of sport coaching as a profession in the conventional sense. This position has been informed by recent developments within South Africa (SASCOC, 2011) and is further reflected in the ongoing discussions to develop the International Sport Coaching Framework (ICCE/ASOIF, 2012). Central to the argument is that sport coaching embodies a service function that in many cases is strongly rooted in volunteer effort as part of a blended landscape that includes part-time paid and full-time paid coaches. The nature of this blend varies according to contextual influences that are most strongly in evidence between sports and countries. The presentation will further develop the key elements of this argument and will focus on the emerging nomenclature being employed within the joint ICCE-Association of Summer Olympic International Federations Project group on the International Sport Coaching Framework. In particular, data will be presented to support an
early analysis of the concept of a blended profession with particular emphasis on coaching status categories; coaching role descriptors and coaching domains. The implications for the further development of coaching as a blended professional area will be considered, with a focus on the leadership actions that might be taken by ICCE and other organisations within the wider professional field. Such actions should include the greater engagement of coaches themselves in the discourse relating to the future direction of the professional area, as well as a stronger engagement with fellow professionals within sport and physical activity. The need for actions that cross international boundaries will also be highlighted, including the activation of proposals in the ICCE strategy (ICCE, 2010) relating to a coaching ‘senate’. Finally, the implications for further research to inform the debate will be highlighted.

Patrick Duffy

S112

Enhancing Children’s Movement Development through Observation
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Enhancing Children’s Movement Development through Movement Observation
Movement Development and ‘Observing Children Moving’
The symposium opens with consideration of the movement development of young children, including factors that support the achievement of movement potential. Delegates will then have opportunities to focus on ‘Observing Children Moving’ (OCM), a ground breaking resource designed to enhance appreciation of human movement and to raise standards for learners. The aim of OCM is to support observation, description and analysis of movement in order to provide appropriate feedback to learners and thereby to increase their knowledge, understanding and performance. OCM addresses the needs of learners aged between 3 and 7 years and exemplifies a range of motor patterns, including gross motor activities, fine motor activities and manipulative activities. Through examination of videos of learners moving, detailed analysis of the movements observed and ‘hot spots’ which provide teaching points for learners, delegates will experience a variety of observation tasks, along with related information and activities. These all contribute to supporting a thorough knowledge and understanding of the constituent elements of human movement.

Patricia Maude

Applications of Movement Observation in Physical Education
In the second part of the symposium delegates will have opportunities to explore and discuss selected aspects of ‘Observing and Analysing Learners Movement’ (OALM). This learning tool is designed for those working with children aged between 7 and 13 years and exemplifies activities related to the physical education curriculum in athletics, dance, games and gymnastics. In this interactive session, the constituent elements of OALM will be presented, through observation of videos of motor patterns, shown singly and in split screens, filmed from in front, from the side and in some cases from behind and above. For further comparison, movement analysis screens can be studied alongside videos. Additionally, a selection of the motor patterns are the subject of detailed biomechanical analysis with specifically adapted videos and supporting information. Through discussion of observations made, descriptions and analyses of movement and through sampling the observation tasks, delegates, delegates can consider applications of these techniques in their own settings and professional work.

Margaret Whitehead and Patricia Maude

S116

Strategies To Prevent Sudden Cardiac Death In Elite Athletes: Pre-Participation Cardiovascular Screening
Antonio, P*; Domenico, C*; Sanyay, S*; Drezner, J*; Paolo, A*

1Institute of Sport Medicine and Science, Italy; 2University of Padua, Italy; 3Medical Director Virgin London Marathon, United Kingdom; 4Associate Professor, Department of Family Medicine, United States; 5Cardiologist, Leachman Cardiology Associates, P.A., United States
Preparticipation Cardiovascular Screening In Competitive Athletes

The sudden and unexpected cardiac death is a rare, but tragic and emotional event, which often assumes high visibility when it occurs in an elite and professional athlete. Unavoidably, this event also raises a number of practical and ethical issues, including feasibility and efficacy of pre-participation cardiovascular screening to prevent these catastrophes. At present, uncertainty still exists regarding the cost/effective strategy for identifying cardiovascular abnormalities at risk in young athletes.

The medical history and physical examination. The medical history and physical examination have originally been proposed by the American Heart Association as the most cost/effective protocol, which is also relatively easy to be implemented in large athlete populations; however, this protocol intrinsically lacks the capability to identify most of the potentially lethal cardiovascular diseases. In the retrospective analysis conducted by Maron BJ et al. in 134 young athletes who died suddenly, more than 80% of athletes had undergone pre-participation medical evaluation comprised of medical history and physical examination; in only 4 athletes (3%), however, the examination raised suspicion of cardiac disease and in just one (with Marfan’s syndrome) was the correct diagnosis made. It is of particular note that only one of the athletes with HCM in this series had a correct diagnosis made during life.

The 12-lead electrocardiogram. The addition of non-invasive testing, such as 12-lead electrocardiogram, has the power to increase the diagnostic efficacy of the screening and, indeed, is relied upon extensively in Italy, where a national-based screening program for competitive athletes has been implemented for almost 20 years. Italian investigators have shown that implementation of the screening program is associated with substantial reduction in mortality due to timely identification of clinically silent, arrhythmogenic cardiomyopathies. Specifically, incidence of sudden cardiac deaths decreased from 3.6 to 0.4 deaths x 100,000 person-years (i.e., from 1 every 27,000 to 1 every 250,000) over 25-year period in screened individuals, corresponding to 89% reduction in deaths. In comparison, there was no change in death rate in non-screened individuals. In the same time period there was a concomitant increase in the number of young athletes identified at screening with cardiomyopathies (from 4.4% to 9.4% and disqualified from competitive sport.

In 2005, the study group of sports cardiology of the European Society of Cardiology proposed the implementation of the Italian model to screen competitive athletes in Europe, and similar statement has been endorsed by the medical committee of the International Olympic Committee and the FIFA. At present, the implementation of the 12-lead ECG into screening program is still largely debated in the U.S.

Domenico Corrado

Impact Of Age, Sex And Ethnicity On The Athlete’s ECG

The cardiovascular adaptation to exercise is governed by the sporting discipline as well as several demographic parameters that include age, sex, size and ethnicity. An understanding of this fundamental principal offers the welcome prospect of reducing false positive results following electrocardiographic pre-participation screening. Sinus bradycardia, voltage criteria for chamber enlargement and repolarisation changes are common to all athletes. In general adolescent athletes and female athletes exhibit less quantitative changes than adult and male athletes. Minor T-wave inversion and notching of the T waves in leads V1-V4 may be observed in Caucasian athletes aged < 16 years old. Some athletes exhibit more profound repolarisation changes that may overlap with those observed in hypertrophic cardiomyopathy, arrhythmogenic cardiomyopathy, long QT syndrome and Brugada syndrome. Athletes of African/Afro-Caribbean origin particularly demonstrate the highest prevalence of repolarisation changes; almost two thirds show ST-segment elevation and approximately 25% reveal T wave inversions. The latter are usually confined to the anterior precordial leads. Pooled data from several organisations and respectable periods of longitudinal follow up have improved our knowledge of the athlete’s ECG and formulated more specific interpretation guidelines.

Sanjay Sharma

A Global Approach To The Prevention Of Sudden Cardiac Death: Preparticipation Screening And Aeds On The Athletic Field

Sudden cardiac arrest (SCA) is the leading cause of death in athletes during sport and exercise. A global approach to sudden death prevention includes both pre-participation cardiovascular screening and emergency planning for SCA on the playing field. The purpose of cardiovascular screening is to identify athletes with conditions at risk for SCD. Screening protocols inclusive of electrocardiogram (ECG) have greater sensitivity, and current evidence does
not support a screening program based on history and physical alone. Modern ECG standards for interpretation allow for a low false-positive rate; however, greater physician training is needed in many countries to properly apply ECG screening. Emergency planning for SCA and the availability of automated external defibrillators (AEDs) provides an additional strategy for the prevention of SCD in athletes. Recent data provides persuasive evidence that successful management of SCA in athletes is possible through prompt recognition of SCA and early access to an AED. Brief seizure-like activity and/or agonal respirations are common in athletes immediately after collapse from SCA. Thus, SCA should be suspected in any collapsed and unresponsive athlete with an AED applied as soon as possible for rhythm analysis and shock if indicated.

Jonathan A. Drezner

“Prevention Of Sudden Cardiac Death In Athletes: The Case Of Coronary Artery Anomalies ”
Like for any other high-risk causes of Sudden Cardiac Death (SCD) in the young, Coronary Artery Anomalies (CAA) should be prospectively studied by a disciplined and prospective mode, before any effective and feasible screening policy can be promoted. Specifically, the studies should include:
1. The prevalence of CAA in a general, young population, in order to establish the prevalence of the targeted conditions (“high-risk cardiovascular conditions”);
2. The incidence of SCD in different-ages populations, subdivided by causes of death/SCD (in autopsy, generalized studies): the concept of risk ratio;
3. Establish the types of CAA that are likely to cause increased risk of SCD;
4. Description of precipitating causes (intensity of exercise, etc);
5. Markers of severity of stenosis in individual cases of CAA.
The Center for Coronary Anomalies at the Texas Heart Institute has been carrying out 2 parallel prospective, populations-based studies:
A. In children of 11-15 years of age (15-20 min acquisition time): clinical questionnaire, EKG, Cardiac MRI by CCAA screening protocol. Primary Targets: HCM, DCM, CAA, EKG abnormalities. At present: 2,000/10,000 cases done. B. In the Houston Forensic Institute/CCAA: study of 2 years of autopsies and genetic studies in cases of SCD of unknown cause at autopsy. Cases are mainly due to SCD or out-of-hospital deaths. Primary Targets: HCM, DCM, CAA, in different subgroups (SCD in the young, deaths from non-cardiac causes, etc). At present: 3,000/7,000 cases done. The main aim of our studies is to establish the feasibility and cost/effectiveness of a new screening protocol.
Paolo Angelini

S127

Designing a Network of Organisations/Institutions for Sport, Sport Education and Sport Science (SSSS)
Haag, H*; Keskinen, KL*; Antala, B*
1Christian-Albrechts-University, Germany; 2Finnish Society for Research in Sport and Physical Education, Finland; 3University of Commenius, Slovakia

Purpose
The purpose of the above workshop can be summarized in the following way:
(1) Networks are an important source for gathering, storing and retrieving information in regard to Sport (Keskinen), Sport Education (Antala) and Sport Science (Haag) (SSSS) and therefore they have to be known.
(2) They are realized in three dimensions which have to be understood in its uniqueness and interrelationship: public (GO’s) – private (NGO’s) – economy.
(3) Discuss and understand major issues which make sure that a holistic approach is realized besides a necessary differentiation within SSSS.
(4) The network is an important issue for ICSSPE, especially in regard to the Association’s Board and its members. Therefore a contribution can be made to further develop and understand ICSSPE in its structure and mission.
(5) Developing by discussion guidelines for future strategies in order to strengthen this network.

Content
The following issues will be presented and discussed:
(1) Structure in regard to SSSS
(2) Topics which stand for a holistic understanding of SSSS
(3) Strategies for bottom-up and top-down relating to a six-circle theory:
local – district – province/state – country – continent – world level

Procedure
• The three content areas will be presented and supported by material to be distributed.
• Three groups will discuss in the group-work manner.
• Results of the work of the three groups will be presented in the audience.
• A summary will be given with a final round of question-answer period to the four workshop organizers.
Physical Activity and Health

Do as I say or do as I do? Familial Influences on Child Physical Activity and Sedentary Behaviour
Watson, PM*, Thompson, JL*, Archbold, V†, Richardson, D‡; Knowles, Z; Murphy, R; Dugdill, L; Cable, NT
†Liverpool John Moores University, United Kingdom; ‡University of Bristol, United Kingdom; †Leeds Metropolitan University, United Kingdom; †University of Salford, United Kingdom

Family Influences on Child Physical Activity and Sedentary Behaviour.
Recent evidence suggests that physical inactivity and sedentary behaviours are distinct and independent risk factors for obesity and related chronic diseases in both children and adults. These behaviours are complex and change over the course of childhood and adolescence due to variations in personal, familial, social and environmental influences. This presentation will provide an introduction and general overview of the roles that families play in influencing physical activity, inactivity and sedentary behaviours amongst children and adolescents. Data will be presented describing what is known about family correlates associated with these behaviours, including parenting styles, parenting practices, logistical support, and role modelling. Gaps in the current research base will be identified, and strategies for intervention that can be targeted in partnership with families to increase physical activity and reduce sedentary behaviours will be discussed.

Janice L. Thompson

The social-cognitive frameworks that exist for children and the child-parent interactions model (within the context of physical activity environments) are grounded in Bandura’s Social Cognitive Theory (1986) and enable parent-child interactions (including those situated in physical activity) to be observed. Nonetheless, there are mixed reviews as to whether parent’s actual physical activity levels facilitate their children’s own activity levels. Consequently, a greater understanding of how physical activity correlates operate within the social and cultural context of the family home are needed if we are to offer more realistic behaviour change strategies. However, there remains limited published ethnographic data on British families. To extend our understanding of why children and families are engaging in or maintaining sedentary behaviours attention was sought to uncover how correlates interact simultaneously within the context of day-to-day existence. For the purpose of this study participant observations were undertaken with one family: 2 females (12.6 years & 43 years), 1 male (10 years) over a 9 month period in an area of high health need (UK). A total of 288 hours of observation were completed in the family home. The interaction and relationships of the correlates to activity adherence will be considered and discussed concurrently against previous literature during this presentation. A further consideration of the study’s findings was also the significant power and capacity neighbourhood ‘members’ had to facilitate or hinder physical activity. In this sense, it would appear that this family’s physical activity perceptions and behaviours were directed at a community level, which needed to be uncovered and observed to better understand the wider context in which physical activity choices are made.
Victoria Archbold & David Richardson

Increasing Physical Activity in Overweight Children: a Familial Approach to Change.
The relationship between physical activity and overweight in childhood is believed to be bi-directional. Whilst a lack of physical activity contributes to the development of overweight, children who are overweight also face
physical, psychological and social barriers to participation in physical activity. For these children, who often report negative experiences of school-based physical education, the family may play a key role in changing physical activity-related perceptions, attitudes and behaviours. This presentation draws on data from the Getting Our Active Lifestyles Started (GOALS) intervention to explore how we can effectively intervene “from the outside” to help families make sustainable changes to their physical activity behaviours within their daily lives. Through weekly fun-focused sessions, GOALS employs a range of behaviour change techniques to support families with overweight children to make sustainable changes to their physical activity and eating behaviours. This presentation reports qualitative data from focus groups with families six weeks into the 18-session GOALS intervention. The focus groups explored how the intervention was impacting on families’ physical activity behaviours and cognitions, and what it was about the intervention that was helping families change. The presentation will conclude with a family case study of a 9-year old child (now 13 years old) who transformed his sedentary lifestyle to become a regional rugby player with high aspirations for the future, based on a retrospective interview with the child’s parents approximately four years after they participated in GOALS.

Paula M. Watson, Zoe Knowles, Rebecca Murphy, Lindsey Dugdill & N. Tim Cable

S19

Partnerships: The Key to Ensuring a Legacy of Physical Activity.
Applebaum, R*1; Bird, W*1; Reynolds, V*1; Jarvis, P*2
1; StreetGames

Partnerships: Catalysts to Promote Active, Healthy Lifestyles
If one were to use ‘purpose and outcome’ to define the terms, partnership and catalyst, they would be synonymous, though not identical. Barring a detailed scientific definition, a catalyst at its core is an ‘agent for change’ that can bring a transformational outcome quickly, efficiently and effectively. Restricting the definition of partnership to less than 20 words, a partnership is about sharing resources that can allow entities involved to achieve collective goals more efficiently and effectively. The words underscored are deliberate—to emphasize this similarity between two important nouns that are essential when we look at global health today and ways to ensure a sustainable legacy of physical activity. Why? Because ensuring sustainable and regular physical activity in all our populations is one very effective solution to helping solve a number of complex health issues we face globally including obesity and Non-Communicable Diseases (NCDs). The Coca-Cola Company has supported sports, athletics and physical activity efforts since its founding 126 years ago. We believed then, as we do now, that as an integrated society all sectors must work together, using new models that enable workable solutions to be developed as quickly, efficiently and effectively as possible. Today, we also recognize obesity and NCDs are multifactorial problems that demand multi-disciplined, workable solutions and that increasing levels of physical activity is one of those solutions. This presentation will provide examples of the Company’s efforts in the area of active, healthy living as one solution to help bring about transformational, positive change to global health and well-being and the importance of partnerships to achieve this goal—to raise the standards of physical activity and help our communities achieve active, healthy lifestyles.
Rhona S Applebaum

The International School Walking Competition, Beat the Street
There is good evidence to show that children who walk to school are generally more physically active. Most walk to school initiatives are aimed at primary school children and much of the research around health benefits has focussed on this group. Beat the Street (BTS) is a global walk to school competition for 11 to 13 year olds. Funded by The Coca Cola Foundation and delivered by Intelligent Health and the public health charity, Knowledge into Action, the competition will invite schools from all over the world to take part. Using the most advanced technology, BTS is designed to capture the imagination and interest of children, with innovative and interactive online tools and resources enabling them to engage with other schools around the world. Following a successful pilot project in 2011, twelve schools in the two most recent Olympic cities (London and Vancouver) will compete against each other in October 2012. In the next two years eight more major cities will take part in the competition. This is a public health intervention based on recent scientific evidence on behaviour change and scrutinised by an
expert advisory group. The project aims to encourage healthy behaviours by increasing the amount children walk. William Bird and Veronica Reynolds

Delivering doorstep sport to young people in disadvantaged communities, StreetGames
Young people living in areas of high deprivation are half as likely to participate in physical activity as those living in affluent areas. However, there is no shortage of demand. Participation in physical activity is profoundly skewed by socioeconomic status. There is a strong association between a lack of physical activity, high deprivation and poor health. Few public health initiatives have greater potential for improving health and well-being than by increasing physical activity. StreetGames is a registered charity and was launched in January 2007 to change lives and communities for the better by delivering doorstep sport. That is, sport at the right time, place, price, and style to engage young people and make sport accessible to those who live in the most deprived areas in the UK. StreetGames is backed and supported by three key partners Sport England, Coca-Cola and The Co-operative who share an interest in helping young people be more active. The aim of each StreetGames project is to be sustainable and become part of the fabric of the community. This leads to stronger and safer communities, a championing of social action and volunteering, as well as improved health and wellbeing.
Paul Jarvis

S28

Physical Activity In Diabetes Management: The Science, Education And Medical Contributions
Robertson, K*; MacMillan, FM*; Gold, A*; Kirk, A*
1Royal Hospital for Sick Children (Yorkhill), United Kingdom; 2University of Strathclyde, United Kingdom; 3Aberdeen Royal Infirmary, United Kingdom

Physical activity and Type 1 Diabetes
Type 1 Diabetes is the commonest endocrine and metabolic disorder affecting children, with an incidence of around 30 per 100,000 per year in the under 15 year olds in Scotland. The cause is autoimmune destruction of the insulin producing pancreatic beta cells and this process usually begins in the first 1-2 years of life. The presentation can be at any age but the peak is around 11-12 years. Total insulin deficiency is incompatible with life so replacement therapy by insulin injection is mandatory. Most children inject insulin 4 or 5 times daily or receive it by insulin pump. They must also test blood glucose levels multiple times daily in order to gauge insulin doses and carbohydrate intake. While it is often said that exercise is the third element of diabetes care (after insulin and carbohydrate) it is a delicate balancing act to optimize blood glucose. For those wishing to participate in sport at a higher level, this is critical since performance is directly related to metabolic control. This presentation will lay out some of the principles involved referring to the evidence based guidelines from the International Society of Pediatric and Adolescent Diabetes.
Kenneth Robertson

Promoting physical activity in Type 1 diabetes
Paediatric patients with Type 1 diabetes can have poorer health and overall quality of life than their non-diabetic peers and some studies suggest that they may be less active than their non-diabetic peers. Regular physical activity has many potential health benefits for any young person but can also benefit areas of health specifically important for those with Type 1 diabetes. In addition being regularly active can reduce the risk of developing diabetic complications. Sedentary behaviour (sitting/lying down) has been shown to be associated with poorer health outcomes in adolescents with Type 1 diabetes. Promoting physical activity participation and minimising sedentary behaviour in this population is therefore important due to the potential health benefits that can be gained. Limited research has investigated the effectiveness of unsupervised physical activity interventions in this group. It is therefore necessary for physical activity interventions targeting this group to be developed which do not rely on the supervision of coaches, researchers or medical staff. Interventions based on theory and which target important behavioural processes are required. In order to determine the key behavioural processes qualitative research with paediatric patients and influential figures is also needed. Intervention studies should incorporate objective measures of physical activity and sedentary behaviour to determine their efficacy, rather than subjective methods
which can be liable to reporting bias.

Freya MacMillan

Physical activity and Type 2 diabetes
In the UK 4-5% of the population have diabetes mellitus and about 85% of these people have Type 2 diabetes. The aetiology of Type 2 diabetes is multifactorial and there are many different phenotypes. In addition the prevalence varies considerably between different ethnic groups. Treatment comprises lifestyle advice with the addition of glucose lowering drugs including insulin and management of cardiovascular risk. There is good evidence that the development of Type 2 diabetes is related to lifestyle and the greatly increasing rates are linked to the increasing prevalence of obesity. Increased physical activity not only reduces the risk of the developing diabetes but also reduces the risk of the complications of the disease. There is evidence that unlike the general population physical activity levels of people with diabetes have not increased over recent years. The management of Type 2 diabetes is complex and physical activity promotion does not always receive the attention deserved for a number of reasons. Strategies are being developed to attempt to address these problems and will be discussed.

Ann Gold

Promoting physical activity in Type 2 diabetes
The evidence that physical activity is an effective therapeutic tool in the management of Type 2 diabetes is well documented. Limited research has addressed how best to promote and maintain physical activity in these individuals. This presentation explores strategies to enhance compliance to physical activity for people with diabetes. Several evidence based guidelines and reviews recommend that physical activity interventions are based on a valid theoretical framework. However there is no evidence based consensus on the best theory, or combination of theories to use. Motivational tools such as pedometers, wearable sensors measuring energy expenditure and point of choice prompts appear to be effective at stimulating short term substantial increases in physical activity, but further strategies to maintain physical activity behaviour change are required. Physical activity consultation has demonstrated effective physical activity promotion over periods up to two years in people with Type 2 diabetes. Future research should identify the longer term effects of this intervention and the effectiveness of different methods of delivery. Overall there needs to be a lot more focus on this area of research. Without this the abundance of research investigating the effects of physical activity on people with Type 2 diabetes is essentially redundant.

Alison Kirk

S39

The Art and Science of Music Interventions in Sport and Exercise
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¹University of Southern Queensland, Australia; ²Brunel University, United Kingdom

Conceptual Approaches to the Application of Music in Sport and Exercise
There have been a number of attempts to develop conceptual frameworks to guide researchers and practitioners interested in music applications in the domain of sport and exercise. The purpose of this paper will be to outline these conceptual approaches, delineate the underlying mechanisms responsible for the effects of music, and present the main trends that have emerged in empirical research. Such trends might serve to guide the construction of evidence-based music-related interventions. Three principal applications of music will be expounded: First, pre-task music that entails the use of music prior to a task i.e. most often as a type of mild stimulant or sedative; second, in-task music that entails the use of music during exercise and can be applied in two forms i.e. asynchronously when it is played in the background without any conscious attempt by the performer to synchronise their movements with its rhythmical qualities, and synchronously when conscious synchronisation does take place; third, post-task music wherein music is used after sport or exercise activity to aid recovery from physical fatigue or injury. This paper will provide a general overview of this field of scientific endeavour with the intention of facilitating a full understanding of the four papers that will follow.

Costas Karageorghis
Effects of Synchronous Music among Elite Endurance Athletes

Effects of synchronous music were investigated in two field studies. In Study 1, music effects were assessed among two elite triathletes and six elite runners during three training runs. A custom-designed iPhone application was developed to record in-task RPE, feeling states, mood responses, distance run, cadence and heart rate data. Compared to the no-music condition, participants ran, on average, 7.5% and 7.2% further but reported lower RPE and more positive feelings and mood responses when running to synchronous music (d = .35) and a music-led condition (d = .29), respectively. In Study 2, nine elite ultra-distance athletes participating in 24-hr and 48-hr races listened to rotating playlists of synchronous motivational music, neutral music, audiobook and silence delivered by iPhone. During the 18-24 hr period, motivational music was associated with a 14 sec, 18 sec and 27 sec per 400-m lap improvement compared to silence (d = .39, p < .01), neutral music (d = .54, p < .001) and audio book (d = .54, p < .001) conditions, respectively. Collectively, findings supported the judicious use of music interventions among endurance athletes.

Peter Terry, Michelle Curran, Alessandra Mecozzi Saha, Ross Bool

Examining the Stability of the Exercise Heart Rate-Music Tempo Preference Relationship

A triad of experimental studies involving the present authors has addressed the relationship between exercise heart rate and preference for music tempo. The purpose of the present study was to examine the stability of the cubic (two points of inflection) exercise heart rate-music tempo relationship found by Karageorghis et al. (2011) in cycle ergometry using a different exercise mode (treadmill exercise) and to examine a number of psychological outcome variables. Participants exercised for 2-min at six exercise intensities (40%-90% maxHRR) and were exposed to musical tracks at four tempi (slow, medium, fast, and very fast) and a no-music control condition at each intensity. Music preference was assessed and participants were administered the Feeling Scale and Felt Arousal Scale during the task. Immediately after each trial, an attential focus item, the short Flow State Scale-2 and items from the Intrinsic Motivation InVENTORY were administered. It was hypothesised that the cubic relationship found by Karageorghis et al. (2011) in cycle ergometry would re-emerge using treadmill exercise and that the most positive motivational outcomes would be associated with the highest music preference scores. Results did not support a cubic relationship but rather a quadratic relationship (p < 0.5). There was also a significant main effect for attentional focus (p < .05; $\eta^2_p = .24$), wherein participants exhibited higher levels of dissociation in all music conditions relative to control.

Leighton Jones, Costas Karageorghis

Psychological, Psychophysical and Ergogenic Effects of Asynchronous Music in Swimming

Research has assessed the psychological, psychophysical and ergogenic effects of music in a range of dry land activities that include 400-metre running, cycle ergometry, indoor rowing and long-distance running. Such work has shown that the judicious use of music can lead to a range of benefits that include enhanced affect, reduced ratings of perceived exertion, greater energy efficiency (i.e., reduced VO2), and faster time trial performances. The purpose of the present study was to assess the psychological, psychophysical and ergonomic effects of asynchronous (background) music in swimming. A sample of 92 volunteer Brunel undergraduates nominated six musical selections for use in the experimental protocol of Stage 2. Twenty six participants were recruited from Brunel University Swimming Club and they went through a 2-week habituation period with Speedo Aquabeat mp3 players prior to the experimental phase. They were then administered two experimental trials (motivational and undeteriorous music at 130 bpm) and a no-music control during which they engaged in a 200-m freestyle swimming time trial. Results showed that participants swam significantly faster when exposed to either music condition relative to control (p < .05, $f\eta^2_p = .18$) and that the music conditions were also associated with higher state motivation (p < .05, $f\eta^2_p = .15$).

Costas Karageorghis, Jasmin Hutchinson, Leighton Jones, Hannah Farmer, Metin Ayhan, Rachel Wilson, Joshua Rance, Stewart Bailey, Christopher Hepworth

Music Applications with Elite Athletes

This applied paper chronicles a variety of music applications used with elite athletes, with particular reference to the Olympic Games. General examples include the synchronization of activities to music in order to capitalise on the well-established ergogenic effect, and using music asynchronously to, for example, induce an appropriate pre-
performance mindset, or intensify responses to relaxation and imagery techniques. Specific examples of music use with elite performers include providing inspiration to bobsleigh and shooting medallists at the 1998 and 2000 Olympic Games, respectively; implementing pre-event arousal control strategies with boxing and rowing medallists at the 2000 Olympic Games; maintaining motivation and training cues during successful rehabilitation from chronic fatigue syndrome of an Olympic canoeist; intensifying visualisation strategies among a lawn bowls team at the South East Asian Games; as an adjunct to audio-visual entrainment, also known as brainwave training, during the trap shooting event at the 2006 and 2010 Asian Games, conditioning responses to specific music to promote ideal brain activity among clay target shooters at the 2008 Olympic Games; and using iPhone technology to deliver music interventions to shooters in preparation for the 2012 Olympic Games.

Peter Terry

Reducing Sedentarism
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1The University of Queensland, Australia; 2University of Southern Denmark, Denmark; 3Norwegian School of Sports Medicine, Norway

Western lifestyles have changed remarkably over the last century, with decreasing levels of physical activity and increased sitting in most populations. While the health impacts of low physical activity have been extensively researched in the last 50 years, the epidemiology of sitting has only recently emerged as a scientific area of enquiry. Recent estimates suggest that working adults spend between 7 and 10 hours each day sitting, with about half this time spent sitting at work. This paper will examine the hypothesis that too much sitting is a risk factor for poor health, even in those who meet the current physical activity guidelines. First, the biological plausibility of too much sitting being a health risk will be briefly considered. Second, a review of the evidence on the health effects of sitting will be presented. This will include results from observational cohort studies on the relationships between sitting and diabetes, cardiovascular diseases, cancers, depression, obesity and all-cause mortality, as well as from experimental studies on the relationships between sitting and metabolic risk factors. Although some findings indicate clear dose-response relationships between sitting and health outcomes, it is difficult to define a deleterious ‘dose’ of sitting as few studies have considered sitting in all domains (eg work, leisure, transport). There is however increasing evidence to suggest that sitting for >8 hours a day is associated with increased risk of many health outcomes.

Wendy J Brown

Numerous epidemiological studies have found an association between amount of sitting, TV-viewing or other sedentary behaviours and different health outcomes. A meta-analysis recently showed that TV-viewing was associated with type 2 diabetes, cardiovascular disease and all-cause mortality. However, measures of sedentary behaviour may be surrogate measures for lack of physical activity, and interventions aiming to reduce sedentary activities may fail to increase physical activity and health. There are very few well designed studies where the amount of physical activity is controlled for when the detrimental effect of sedentary behaviour is analyzed, and only one randomized trial has manipulated sedentary behaviour with small breaks to improve health without changing physical activity substantially. Many studies have adjusted the analysis between sedentary behaviour and health for physical activity level, but is the information on physical activity level sufficiently good to avoid too much residual confounding? This presentation will look at problems related to showing that sedentary behaviour is decreasing health independent of physical activity level. The problem is important because future preventive strategies may change substantially if it turns out that reducing sedentary behaviour may be as effective as increasing physical activity. Some countries have already changed physical activity guidelines and included special recommendations related to sedentary time, but it is questionable if these changes are based on solid evidence.

Lars B Andersen

Sedentary behaviors include sitting during leisure time, at work, and during commuting. Sedentary behaviors such as TV viewing, using a computer or driving a car typically demands low levels of energy expenditure. Youth and
adults spend most of their waking time sitting or doing light activities, and most of them do little of moderate to vigorous intensity activity. This combination leads to an overall low energy expenditure which has a detrimental effect on many health outcomes. Dealing with this combination – giving low levels of energy expenditure - would reduce the risks of various diseases such as cardiovascular diseases, type 2 diabetes, musculoskeletal diseases, and psychological disorders. In addition, low level of energy expenditure is one of the key determinants of the current epidemic of overweight and obesity in Europe. In order to both reduce sitting time and to increase the level of physical activity there are several potential solutions. Among them is promotion of physical activity at school, to focus on active transport, to focus on the build environment, to do structural changes at the workplace, and to increase the neighborhood walkability. Programs will be more effective in communities where physical activity is made easy.

Sigmund A Anderssen

S51

Practical Nutrition and Weight Management Strategies for Active Individuals
Hunking RD, P*; Brewer, J*; Hetherington, M*

Practical Nutrition Strategies for Active Individuals
The value of regular physical activity to help manage weight is well recognised. Whether the individual is a trained athlete looking to meet the demands of training and competition and seeking to optimise their physique for their sport, or a member of the community embarking upon a fitness programme to lose or maintain weight, for long term good health it is essential they follow a balanced diet. Practically speaking an active person should work on developing a core eating plan that covers daily requirements for a non-training day then a range of eating strategies to address the nutritional demands of training and recovery. Obesity remains the one of the biggest challenges facing public policy. Many people join a health club and embark on a fitness programme or take up a new sport to help them lose weight. However, for some individuals exercise alone is insufficient. The mantra ‘eat less, do more’ holds true but strategies to practically achieve this can be challenging since exercise can stimulate overall appetite in an attempt to promote restoration of fuels and maintenance of body weight. In addition, intensity and duration of exercise, environmental conditions, gender and macronutrient selection can all impact appetite and subsequent weight management. Even modest weight loss can reduce the risk of obesity related diseases but to lose weight an energy deficit must be created. Sensory appeal of food is aided by sweetness and replacing sugar with a low-calorie sweetener is likely to benefit weight management by lowering energy intake. This presentation will examine different nutritional strategies that individuals can follow depending on their activity level to assist them in achieving their activity and weight goals.

Penny Hunking

Practical Hydration Strategies for Active Individuals
Exercise generates an increase in core body temperature which is regulated through the evaporation of sweat from the skin, and the convection of heat to the external environment. Sweat rates vary depending on exercise duration, intensity and climate, and consequently the hydration strategies needed to compensate for sweat loss will also vary. Whilst many studies have shown the negative impact of dehydration on both physical and mental performance, the need for sensible and science-based hydration, which reflects both the practical and physical needs of the exercising individual, is essential. For many, exercise is used as a means to promote health, fitness and weight control, whilst for others the focus is on optimising performance. Thus in addition to the type of exercise and the prevailing climate, the rationale for exercise must also be considered. Those who exercise at a low intensity for periods of 20-30 min will have very different hydration requirements to individuals exercising at a high intensity for periods of 60 min or longer. In order to maintain optimal hydration before, during and after exercise, a range of fluids can be used that meet the different need-states of the exercising individual, including water, zero calorie, hypotonic, isotonic and hypertonic drinks. Hydration strategies must reflect the specific requirements of the individual, and the physical demands of the exercise that they are undertaking. Therefore this presentation will examine the different hydration requirements of a selection of exercise modalities, and explore the potential
hydration strategies that could be adopted to meet the needs of the exercising individual.

John Brewer

Prompts, Primes And Promoters: Using Subliminal And Explicit Psychological Aids To Weight Management
The modern built environment and the obesigenic food environment conspire to encourage sedentary behaviour and overconsumption. Psychologists have characterised multiple external cues which facilitate the tendency to overconsume; fewer studies have been done to identify cues which can assist dieters to achieve their goals and to resist temptations to overeat. Although it might seem obvious that greater physical activity will produce healthier outcomes such as greater fitness and more weight loss, there are significant individual differences in the response to systematic exercise regimes, with some participants gaining weight (fat mass) in response to daily exercise. Individuals may view exercise as an excuse to overeat whereas others find exercise incompatible with eating unhealthy foods. Two parallel themes in recent experiments have explored what prompts might be used by consumers to achieve healthy eating goals. In the USA researchers found that viewing fitness commercials lowered food intake at lunch by 20% whereas reading about physical activity encouraged participants to serve more snacks; however, working with children and using superheroes as models the same investigators found that role models prompted healthier choices than an explicit health prompt. We have found food and subliminal images of food, drinks and activities can be used to assist dieters in resisting the temptation to overeat. In particular, priming individuals with healthy foods or images of foods reduces food intake at a subsequent snack occasion. Overall, there is emerging evidence of prompts, primes and promoters which can facilitate healthy eating in adults and children; this can be used to help achieve specific weight loss goals for overweight and obese individuals and a healthy diet for all.

Marion M Hetherington

SS2

Playground to Podium

Armstrong, N*1; Baxter-Jones, A*2; McManus, AM*3
1University of Exeter, United Kingdom; 2University of Saskatchewan, Canada; 3University of Hong Kong, Hong Kong

The Role of Growth and Maturation on Selection into Sport
There is considerable variation in the tempo and timing of growth and maturity not only between genders but also within genders. Whereas growth refers to increases in the size of the body or its parts, maturation refers to progress towards the mature adult state. Size has been shown to be an important predictor of success in youth sport. Since maturity status also influences size, this too has been linked to sporting success in childhood and adolescence. In contrast to a child’s chronological age (CA), which relates to time from birth, a child’s biological age (BA) relates to time from the mature state. Thus the early maturing child is characterised by having an advanced BA for their CA and the late maturing child advanced CA for their BA. It is important to remember that (i) all healthy children will reach the fully mature state and (ii) in general final size is influenced more by genetic predisposition than environmental influences. Thus, when selecting a sport that a child will be successful in as an adult, it is their adult body type that needs to be appropriate for that sport rather than body type dictated by stage of growth and maturation.

Adam Baxter-Jones

The Developmental Physiology of Elite Young Athletes
Success in elite youth sport is underpinned by a range of physiological variables which act in a sport-specific manner to influence performance. Sport performances are age-maturation- and gender-related and dependent on the intensity and duration of the exercise challenge. Knowledge of paediatric exercise physiology has been constrained by being unable to interrogate muscle in vivo. Conventionally research has been limited to the estimation of muscle metabolism from observations of blood and respiratory gases during maximal or steady state exercise and the analysis of a few muscle biopsies taken at rest or post-exercise. The introduction of 31P-magnetic resonance spectroscopy and breath-by-breath oxygen uptake kinetics studies has provided new insights into
paediatric muscle metabolism. The extant data show that children and adolescents respond to exercise with enhanced oxygen utilization within the myocyte compared with adults and that their responses are consistent with a greater recruitment of type I muscle fibres. Gender differences are apparent and in both genders the development of aerobic and anaerobic energy systems is asynchronous. Individual biological clocks run at their own rate and to interpret the performance and progress of elite young athletes in relation to their growth and maturation coaches require an understanding of developmental exercise physiology.

Neil Armstrong

Training the Elite Young Athlete - Maximizing Development and Minimizing Risk
There is ample evidence to show that both trained and untrained children adapt physiologically to training and the elite young athlete is stronger, more powerful and possesses a greater level of aerobic fitness than their non-elite young counterpart. For the many children who engage in competitive sport, exposure to intensive training means the benefits of participation can be over-shadowed by risk. The level of intense training required for success at the elite level was, for a long time, thought to cause disruption to normal growth and maturation. It would appear that exercise training, without other predisposing factors, is unlikely to cause aberrations to either growth or maturation. Nevertheless, there is clear evidence of a boundary between healthy and unhealthy levels of exertion when coupled with caloric limitation. Although development of expertise in sport does require many hours of training and concentrated practice, in the early developmental years, opportunity to sample many activities and engage in deliberate play appears to play an equally important role in the development of future sport expertise. Elite young athletes need to be provided with an environment, which optimizes the development of their talent, yet minimizes risk or harm.
Ali McManus

It’s Natural to Play, Creating Environments for Healthy Activity in Paediatric Populations
Knowles, ZR*1; Stratton, G*2; Graves, LE*1; O’Dwyer, MV*1; Sayers, J*3
1Liverpool John Moores University, United Kingdom; 2now Swansea University, United Kingdom; 3Mersey Forest, United Kingdom

21 Years of Play Based Research at JMU Research Institute of Sport and Exercise Sciences.
This symposium will celebrate 21 years of play based research at JMU Research Institute of Sport and Exercise Sciences focusing on Playgrounds, Active Play, Natural Play and Exergaming. The focus of this short introduction will be to set the context for the presentations that follow which will provide examples and impact from contexts in which active play has been studied. This will be achieved by firstly plotting both historical and contemporary issues together with policy influences related to the study of active play.
Zoe Knowles

The Liverpool Sporting Playgrounds Project (LSPP).
Children spend a significant proportion of their early lives at school. During the school day children have an opportunity for daily activity in a peer controlled environment. Moreover children experience around 600 playtimes every school year. The REACH group in Liverpool developed playground intervention programmes which involved reconfiguring the environment using multi-coloured markings and fixed equipment. The findings suggested a significant change in physical activity (Ridgers et al, 2010) could be sustained for the medium term. Further, this work built upon other interventions which suggested that playground redesign could result in significant increases in energy expenditure (Stratton & Leonard, 2002) and reductions in anti-social behaviour (Ridgers et al, 2011).
Gareth Stratton

Exergaming.
Encouraging physical activity and discouraging sedentary behaviour is important as young people spending more
than 2 h∙d⁻¹ watching TV and playing video games are at greater risk for overweight than peers accumulating less than 2 h∙d⁻¹. Time spent sedentary in youth is also negatively associated with metabolic health. Thus, as we live in a society that encourages us to sit down and spend less time being physically active, we believe the use of active video games as an innovative tool to promote positive behaviours warrants attention. Our research group has collaborated on exergaming projects with Nintendo Ltd, New Concept Gaming Ltd and Helena Homes.

Lee Graves

Physical Activity in Preschool Populations.
Preschool children are the most active segment of the population, however prevalence studies suggests that they are not sufficiently active to benefit their health. The early years represents an ideal window of opportunity to promote healthy behaviours such as increased physical activity as children’s behaviours are more malleable during this early stage of life. We will describe the effects of a school based intervention and a family focused intervention on preschool children’s sedentary time and physical activity levels. Findings from both studies offer important implications for researchers involved in intervention design and also professionals working with preschool children.

Mareesa O’ Dwyer

Natural Play.
Natural play research has focused on examining children’s perceptions, knowledge and experiences of play in the natural environment both prior to and following their engagement in a 12-week Forest School programme. Parent’s perspectives on play, barriers to and perceptions of their child’s engagement in natural based activities post programme were also sought. These projects were undertaken in partnership with Mersey Forest one of the UK’s leading environmental regeneration initiatives based in the North West of England.

Jo Sayers

Physical Activity and Health: Body, Mind and Well-Being
Blair, S*; Fox, K; Mutrie, N

Physical Activity and Physical Health
Sedentary habits are highly prevalent around the world and the WHO report indicates that physical inactivity is the fourth leading risk factor for death, following high blood pressure, tobacco use, and high blood glucose. According to this report, physical inactivity causes 3.2 million deaths/year. In the USA approximately 25-35% of adults are inactive, meaning that they have sedentary jobs, no regular physical activity program, and are generally sedentary around the house and yard. Given that sedentary and unfit individuals are at approximately two-fold higher risk for many health conditions than those who are moderately active and fit, the population attributable risk (PAR) of inactivity is high. In fact the PAR of inactivity is arguably one of the highest of all the conventional risk factors. In the Aerobics Center Longitudinal Study the PAR for low fitness in more than 50,000 women and men followed for many years is 16-17% of deaths. This is far higher than other putative risk factors for mortality. For example, obesity accounts for 2-3% of deaths in this cohort. In fact, in this cohort, low fitness causes more deaths than obesity, diabetes, and smoking combined. To address the major public health problem of physical inactivity we will need to consider and evaluate societal, environmental, and individual approaches to increase physical activity.

Steven N. Blair

Physical Activity and Maintenance of Cognitive and Emotional Health
Evidence is increasingly showing the importance of an active lifestyle in the maintenance of a sound and functional mind. Syntheses of studies indicate that regular physical activity in middle to older age substantially reduces the risk of premature cognitive decline, dementia, Alzheimer’s disease and clinical depression. Additionally, engagement in formal exercise programmes mainly involving aerobic activity indicate improvements in aspects of cognitive function in older adults. Research with animals indicating structural and functional changes in the brain as a result of exercise is now being confirmed in humans through the use of functional magnetic resonance
imaging. Daily active living is also associated with aspects of mental health and quality of life in older adults. Less is known about the effect of exercise on the cognitive function of younger people but research looks promising. 

Kenneth R. Fox

Physical Activity – Enhancing Quality of Life and Well-Being In this presentation the effect that physical activity can have on quality of life and well-being will be presented using the framework of positive psychology. Seligman (2002) suggested that the goal of positive psychology is to “...learn how to build the qualities that help individuals and communities not just endure and survive but also flourish” (p. 8). Physical activity is one human behaviour that will help both individuals and communities survive and flourish. The presentation will illustrate that at an individual level, physical activity has the capacity to foster positive emotions, enhance quality of life even for those suffering from disease, and to buffer individuals against the stresses of life.

Nanette Mutrie

Vascular Responses and Adaptations to Exercise; Key Mechanisms Linked to Lowered Risk and Increased Health and Mortality
Buckley, JP1; Gielen, S*2; Green, D*3; Schmidt-Trucksass, A*4
1University of Chester, United Kingdom; 2University of Leipzig, Germany; 3University of Western Australia, Australia; 4University of Basel, Switzerland

Since the time of Hippocrates, the health benefits of a physically active life have been documented and yet not until the 1950’s, with the work by Professor Jeremy Morris in the UK, was the epidemiological evidence-base for such reports scientifically confirmed; the main outcome being the link between physical activity in one’s occupation and/or leisure-time and cardiovascular health and mortality. Similarly the work of Paffenbarger and his team added more evidence in the US, and with an added emphasis on exercise training in leisure time. By the 1990s, work by such groups as Leon or Blair and co-workers at the Aerobics’ Institute in Dallas, augmented the work of Morris and Paffenbarger by providing long-term follow-up information on aerobic fitness and physical activity as compelling risk factors for cardiovascular disease and all-cause mortality. At the turn of this past millennium, Myers and his group published in the New England Journal of Medicine a more defining link between fitness and cardiovascular related premature mortality in those with and without cardiovascular disease. Up until this time it was not clear why, when all main factors had been controlled, physical activity and fitness were independent risk factors and not simply as influences on other risks such as obesity, diabetes, lipids, blood pressure and even family history. Only until the turn of this recent millennium was a key mechanism starting to arise; the direct effect of physical activity and exercise training on enhancing endothelial integrity, vasodilatory responsiveness and adaptation to exercise training. This symposium therefore aims to bring together some of the pioneers and leaders who have provided this more recent evidence and will include reviews and the latest updates on the vascular training phenomenon.

Coronary vascular changes - Dr Stephan Gielen
Peripheral vascular changes - Professor Danny Green
Micro and retinal vascular changes – Dr Arno Schmidt-Trucksass
Abstract Title 1: Effects of Tai Chi: New Insights in Tai Chi Research

Born as a martial art form, tai chi is an ancient Chinese exercise consisting of slow, relaxed movements for total self-development. Nowadays millions of people around the world practice Tai Chi. It had drawn more and more researches, most of which are focusing on balance and fall prevention, particularly in older adults. Besides, increasingly numbers of studies have assessed the aerobic nature and other physical benefits, such as the cardiovascular conditions, pain syndromes, autoimmune and immune conditions, etc. Mental health issues have also been investigated, including depression, anxiety, attention deficits and sleep problems. Although in recent years it witnessed tremendous growth studies on Tai Chi, the quantitative basis for determining the adequacy of Tai Chi exercise is still lacking. Most of the researches had focused on health and well-being of the exercise for senior adults, it still needs studies concerning the effects on younger and middle-aged people, more longitudinal researches are also needed. Besides, it was difficult to draw firm conclusions from the benefits reported, therefore, more well-designed studies are needed in the future. Moreover, it is not yet clear which of the components in Tai Chi makes the exercise form especially effective for seniors; it needs to explore more comprehensive basis for understanding the inner mechanisms of Tai Chi.

Yu Liu

Changes of expression of complement regulatory proteins CD55 and CD59 on elderly peripheral blood leucocytes and erythrocyte after Tai chi intervention

Objective: There are two major human cell surface complement regulatory (CReg) proteins: decay accelerating factor (CD55) and membrane inhibitor of reactive lysis (CD59) widely expressed on human blood cells, including leukocytes and erythrocyte, and protect these cells from autologous complement-mediated lysis. However, the evidence available to suggest that physical exercise can affect the expression of CD55 and CD59 among the elderly population is lacking. Thus, the purpose of the present study was to compare the changes of CD55 and CD59 expression on peripheral blood leucocyte subpopulations (lymphocyte, neutrophils and monocytes) and erythrocyte in the elderly who experienced 24 weeks Tai Chi exercise.

Methods: 170 (76 males, 94 females) healthy subjects aged 55-65 years, who volunteered to participate in this study by recruiting in Shanghai and were randomly divided into control group (38 males, 47 females) and Tai Chi group (38 males, 47 females). The subjects in Tai Chi group were prescribed a 24 weeks (60 minutes per time, 3 times per week) training programme by qualified instructors. CD55 and CD59 expression on erythrocyte and the leukocyte subsets surface were assessed by indirect immunofluorescence assays and flow cytometry. Mean fluorescence intensities (MFI) were recorded for CReg protein-labeling in each subpopulation. For the control group, the pre- and post-exercise assessments were conducted in the same way, however, there was no Tai Chi intervention.

Results: Compared to pre-exercise, lymphocytes, neutrophils surface CD55 expression showed that there was generally an downtrend in Tai Chi subjects 24 weeks intervention. On both monocytes and erythrocyte surface, CD55 expression levels decreased significantly post exercise. However, the expression of CD55 on lymphocytes and monocytes cell surface was significant higher after Tai chi exercise. Whereas in control group, the erythrocyte surface CD55 expression decreased significantly, and the lymphocytes cell surface CD59 expression showed a significant increase after Tai Chi exercise.

Conclusion: Tai chi exercise maybe activate the negative feedback regulate mechanism in elderly, but there were different influence in the white blood cell subsets (lymphocytes, neutrophils, monocytes) and erythrocyte surface of CD55, CD59, the influence of which the erythrocyte more obvious. This study can provide theoretical support for the further study of the relationship between erythrocyte immunity and exercise of the complement system.

Dinghai Yu; Ying Zhao
Erect Spine and Small-Heavenly-Circuit Phenomenon in Qi-Gong

Research Background: Tai-chi-quan, qi-gong and somatic skills are widely used in alternative treatments for health recovery. Opening jen and tu channels and aware small-heavenly-circuit phenomenon is the sign to reinstate health in qi-gong. Qi-perception is a personal somatic awareness, outsiders have no idea. However, its visible phenomenon is the correct body shape and straight spine. Structure approaches of somatics also require an upright spine and good body structure to get into structure integration.

Research Hypothesis: According to authors' pilot study of qigong and somatics found that. Through body work to adjust the body correct and spine erect, similar phenomenon as small-heavenly-circuit will take place. This study assumes that small-heavenly-circuit and structures integration as the same phenomenon, and tries to explain the qi-perception of jen and tu channels by somatic viewpoints.

Research Results: Practicing qi into the state of small-heavenly-circuit will be aware of qi-perception as that, the so-called qi which goes up in du channel on the back, down in jen channel on the abdominal, and body and mind into a static state. From the perception of muscles and bones of qi-gong skills to erect spine, the back’s extensor muscle contraction, upward pull stretch spine, and the abdominal’s adductor muscle relax down, which generates the awareness of back up and abdominal down.

Conclusions: The key points and important acupoints to reach the state of small-heavenly-circuit are related to hinder the body in an upright position and to control standing upright. They are also related to the disease about reduction of sports ability. Through the understanding of small-heavenly-circuit, the mechanism of playing qigong of health and scientific basis of qi-perception can be known more.

Chih-Ming Lee, Zhen Wang

What Is Missing from Current Tai Chi/Qi-gong and Health Research?
With their long and rich history in China, Tai Chi and Qi-gong have been shown to be useful body-mind exercises for improving people’s mental and physical wellbeing. With the completion of many clinical trials, scientific evidence has quickly accumulated to support their effectiveness and they are now being accepted as a conventional treatment or health promotion means by mainstream medical and health professionals and communities. Yet, several important aspects are missing from the current Tai Chi/Qi-gong and health research. For example, few studies were conducted to address critical issues related to dose-response of Tai Chi and Qi-gong (e.g., How long, how often, and which specific routine should be practiced?) and the mechanism, as well as distinctive features, of these exercises (e.g., What is Qi, or vital energy? How is Qi linked to health benefits?). Lack of appropriate measurement tools that can quantify Tai Chi and Qi-gong interventions accurately is another limitation. This presentation will review these aspects, limitations, research efforts made, and lessons learned in Tai Chi/Qi-gong and health research, and outline suggested future research directions.

Weimo Zhu, Dong Zhu

The Functions, Values and Measures of Wushu Health Communication
With the fast development of science and technology and the increasing improvement of people’s material living standards since 1950s, man’s pursuit of health has been strong and eager. Health is no longer simply a personal or family issue, it has become a social issue that influences the development of a country. National health is of equal importance to cultural and educational qualities of the masses. Under this background, the theory of health communication put forward by western scholars draws general attention from the academic circles, and the application of the theory on health communication plays a significant role in health promotion, disease prevention, psychological adjustment, social adaptation ability, and in the cultivation of moral health. Chinese Wushu undertakes more and more global responsibility in the field of health as a typical Chinese traditional sport. Viewed from the perspective of health communication, the history of Wushu development is a history of wushu health communication. The paper suggests on the basis of health communication theory, the present situation of Wushu international communication and the analysis of the functions and values of Wushu communication: Wushu health communication can serve human physical, mental health and help cultivate good social adaptation ability and moral healthy habits. Its values lie in: Wushu health communication can promote the cultivation of “life - long sports” conception; boost the construction of national health quality and soft power; integrating foreign and native cultures; benefit the whole world. In addition, Wushu health communication can be strategic to the promotion of global health and a solution to the aging problem; can be the primary resource and guarantee for
expanding economic development; can be the first choice of health promotion to improve the poor; can be a strategic way of decreasing the state's investment in medical care and reducing residents per capita health care costs; can offer some reference for traditional culture of different nations going to the international arena.

Yucheng Guo; Taoguang Liu; Tonggang Fan

Hydration In Sports And Exercise: Learning From The Past And Lessons For The Future

Maughan, R*; Murray, B*

It has long been recognised that dehydration, if sufficiently severe is harmful to health and performance. There is much debate, however, about the level of hypohydration at which meaningful effects become apparent. The environment, the nature of the exercise task and the physiology of the individual may all affect the relationship between hydration status and performance. Historically, a strong link was noted in industrial settings between sweat loss, fluid ingestion and performance. It was also observed that high sweat losses were often associated with muscle cramps, especially if these losses were replaced with plain water. Hyponatraemia was also noted to be a risk more than 80 years ago. The development of specific drinks for consumption during exercise is relatively new and opinions on the optimum formulation continue to evolve. Most drinks are approximately isotonic, but toxicity per se is less critical than composition. It is also now recognised that high carbohydrate concentrations can be tolerated if drinks contain a mixture of carbohydrates that rely on different intestinal transporters, allowing greater amounts of substrate to be supplied to muscles. The role of the gut itself is also now recognised, especially the degree to which it can adapt to cope with high rates of fluid and substrate ingestion.

Ron Maughan and Bob Murray

Active Living Of Children In EU-Communities: Concepts, Strategies And Outcome

Naul, R*¹; Schmelt, D*¹; Dreiskämper, D*²; Kornbeck, J*³; Tietjens, M*²; Hoffmann, D*¹
¹University of Duisburg Essen, Germany; ²University of Münster, Germany; ³European Commission, Belgium

The European Commission and health-enhancing physical activity (HEPA): towards a Council Recommendation? The presentation will provide an overview of the Commission’s activities in the field of the promotion of health-enhancing physical activity (HEPA) since 2005, including a commissioned study and its political follow-up. Action points in the Commission’s White Paper on Sport (2007) and Communication on Sport (2011) as well as the Council’s EU Work Plan on Sport 2011-14 (2011) will be explained and put into context. The presentation will explain how the EU Physical Activity Guidelines (2008), a document with jointly agreed, yet legally un-binding standards might in the future be used for policy development as EU level, contingent upon the adoption of a Commission proposal for a Council Recommendation on HEPA. The aim will be to show how research-based evidence can be channeled into the policy-making process.

Jacob Kornbeck

Physical Self-Concept and Motor Ability of Primary School Children

The Intervention Project 'healthy children in sound communities (hcsc; german: gKgK)' aims that by an integrated model of communities, schools, sport-clubs and scientific sup-port Motor Ability and Life quality of primary school children can be sustainably improved. Intervention time is four years, in which Motor Ability and BMI as well as psychological (e.g. Self-Concept) and social factors (Class-cohesion) are analyzed. In this presentation correlations between physical, social and psychological factors will be discussed. In the first cohort 369 children took part in the intervention since 2008. The physical self-concept was measured with a 21-item questionnaire (PSK-K, Tietjens et al, 2012) at 257 participants (143 female, 114 male, age 9.27 years, SD = .53 in class three). Measuring was repeated in class four. Further data was collected by questionnaires about class-clime, children’s and parents’
lifestyle as with the German Motor Ability Test. A regression analysis shows a significant influence of Motor Abilities velocity (β = .230) and endurance (β = .279) in second class to physical self-concept in third class. Further, BMI correlates negatively with self-concept at all time of intervention (e.g. t3 r = -.341). There are gender differences inside questionnaire: Items of Sport Abilities are higher at boys, those of attractiveness significant higher at girls (F (1,255) = 4.164, p = .01η² = .026). Further results of Self-Concept measuring repetition in class four and of class-climate and lifestyle factors will also be presented at the congress. Results show that motor development and weight strongly influence the physical self-concept and other psychological factors of children. Therefore intervention projects and preparatory work should focus on integrated models which include as well physical as psychological factors.

Dennis Dreiskämper

Healthy children in sound communities - a 4 year intervention pro-gram. Main outcome of BMI and physical fitness development.

Healthy children in sound communities (in German: Gesunde Kinder in gesunden Kommunen) is a four year longitudinal intervention and evaluation study with an integrated approach of a multi-component program (PA/PE, nutrition, active transportation) with a local network setting strategy (school, sports-club, municipality etc.) In 12 communities and 39 schools at the Dutch-German border the intervention program has been implemented. This presentation gives an overview of structure, intervention and evaluation of the project as well as main outcomes of the motor development and BMI after four years. The physical fitness test for North Rhine-Westphalia (NRW) which includes BMI measurements was conducted four times in four years with 6 to 10 years primary pupils (n = 369). Moreover, a parents’ lifestyle questionnaire focusing on the individual social context of physical activity, nutrition habits, time allocation for modern electronic media and child-rearing was applied as well as a children’s questionnaires focusing on physical activity, self-concept and group climate. The presentation refers to 369 children who be-long to the first cohort group and highlights results from endurance, coordination and power Items and also BMI. BMI measurements from T1 to T3 show, that the number of obese children remains static (7.7 %) and a slightly low increase of overweight from 8.1% to 9.5% is noticeable. The mo-tor performance in coordination (balancing backwards, jumping sideways), power (Push-ups, Sit-ups) and speed endurance (20-m sprint) are larger than the national average. The presentation will give information about the latest developments after the fourth and final measuring time. Results show a stagnating prevalence of overweight and obesity, which is a success be-cause German reference data imply that the number of overweight children increases especially in the timeframe of basic schooling (6 to 10 years). Moreover, the motor perfor-mance increases significantly. Data suggest that a multi-component program with an indi-vidual promotion of children with special needs works if different motor development levels are considered as well as different stakeholder interventions are coordinated.

Dorothee Schmelt

S126

Evidence Into Practice - Are Standard Cardiac Rehabilitation Guidelines FITT For Most Heart Failure Patients?

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In 2010, the National Institute for Clinical Excellence (NICE) in England included exercise-based rehabilitation within its guidelines for managing people with chronic heart failure (CHF). The evidence base for these guidelines is paralleled by the 2010 Cochrane systematic review on Exercise based rehabilitation for CHF (Davies et al.). Epidemiological data reported in NICE (2010) highlights that a large proportion of people with CHF are older than 65 years and with a majority around 75 years of age. The Cochrane review, however, reported out of the 19 selected studies on exercise, that fifteen (79%) involved patients with a mean age of 55 or less to 65 years, and only four studies (21%) in patients over 66 years, of which only one was in patients older that 70 years. Data on over 1000 patients attending cardiac rehabilitation research studies and/or programmes managed by the specialists identified within this working group concur with the age profiles reported by NICE and with correspondingly low levels of fitness (estimated at 5 METs of less). This therefore means that in many patients, the
delineation between rest, low, moderate and high intensity activity is difficult to differentiate; patients are easily susceptible to working in high intensity zones, along with symptoms of shortness of breath and muscle fatigue when bouts of activity are greater than two minutes. It is thus difficult to achieve the frequency, intensity and duration (FITT) targets recommended in standard cardiac rehabilitation guidelines. The aim of this symposium is therefore to review and potentially recommend altering current guidelines for the benefit of the typically older and low fitness levels of most people with CHF.

An overview of current guidelines and profiles of typical CHF participant ages and fitness levels attending cardiac rehabilitation in the UK –
Laura Burgess

Factors affecting and needing adaptation in exercise testing of people with CHF, including heart rate, rating of perceived exertion and respiratory responses to exercise –
Dr Lee Ingle

Setting truer and more achievable frequency, intensity and duration (FITT) targets for CHF patients older than 65 years and/or with fitness levels below 6 metabolic equivalents (METs) –
Rosalind Leslie

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Health and Physical Activity in Spinal Cord Injury
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Physiological responses to exercise following spinal cord injury
Whether the nature of spinal cord injury is traumatic or congenital this condition exerts significant effects on functional capacity. Depending on the level, severity and duration of spinal cord injury these effects will vary and can have considerable effects on health and activity. This introductory talk will consider the general effects of spinal cord injury on two key factors affecting functional capacity, those of recruitable muscle mass and the sympathetic nervous system, and how these systems affect changes in functional capacity, energy expenditure and health. Other physiological systems affecting daily living and activity patterns such as cardiovascular function and body temperature regulation will also be presented along with methods for improving health, fitness and functional capacity.
Mike Price.

Spinal cord injury: Epidemiology, classification and medical complications
Spinal cord injury is an uncommon injury. However, when it occurs, international classification methods are used to determine neurological and functional prognosis. This presentation will discuss the epidemiology, etiology and classification of spinal cord injury. After spinal cord injury every organ system undergoes physiological changes that impacts upon participation in physical activity. Common medical complications of spinal cord injury include; neurogenic bladder, neurogenic skin, neuropathic pain, autonomic dysreflexia, neurogenic osteoporosis and impaired thermoregulation. These comorbidities can impair participation in simple activities of daily living to more complex activities such as participation in wheelchair sports. We will describe the neurological etiology of each common medical complication and its corresponding prevention and treatment. Finally we will discuss the impact each complication has on participation in physical activity and ways to adapt to optimize participation in physical activity/sports.
Michelle Trbovich.

Long term rehabilitation and physical activity
The final presentation will review research relating to more long term concerns in the rehabilitation of persons with spinal cord injury. For example, due to the lack of mechanical loading on the lower body as a result of spinal
cord injury, osteoporosis occurs in the lower limbs. Consequently, the effects of physical activity and nutrition on body composition and bone density are of clinical importance to this population. Furthermore, many other musculoskeletal and metabolic conditions are often observed, examples of which will be presented along with research examining the restoration of upper limb function. Finally, research relating to the effectiveness of home-based exercise programs in extending therapeutic exercise into the homes of outpatients and facilitating wellness will be considered. This presentation will provide delegates with an insight into physical activity and health in the spinal cord injured population, integrating the experiences of practitioners from within a large rehabilitation centre.

Jenny Kiratli
Upper body exercise: Applications from Elite Performance to Clinical Rehabilitation
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Upper body exercise and its applications
Research into exercise physiology and human performance has traditionally used lower body exercise modes. However, during the 1980s there was a growth of scientific interest associated with understanding the physiological responses to upper body exercise. Such an increase in interest stemmed from the fact that, when compared to lower body exercise, upper body exercise elicits unique physiological responses to acute bouts of exercise and potentially unique adaptations to upper body exercise training. These adaptations are relevant to and have applications for elite competitors within those sports using predominantly the upper body. However, it is also important to note that such knowledge holds important applications for a range of populations in the context of rehabilitation and both vocational and recreational activities pursued by able-bodied individuals as well as those with physical impairments. As well as considering the key physiological differences between upper and lower body exercise modes from cardiovascular, metabolic and thermal perspectives this presentation will also provide expected values for conventional indicators of aerobic and anaerobic capacity in able-bodied and clinical populations.

Mike Price

The efficacy of upper body training programmes
The second presentation of the symposium will consider the physiological responses to upper body training and the potential physiological adaptations. Increases in muscle strength and aerobic capacity will be emphasized along with central and peripheral limitations to upper body exercise. The effects of upper body training programmes within clinical populations such as persons with spinal cord injury and intermittent claudication and those patients undergoing hip fracture rehabilitation will also be compared to those for able-bodied individuals. This presentation will also consider upper body exercise models for heat acclimation which have been undertaken in able-bodied participants and individuals with spinal cord injury. The benefits of upper body training on the performance and functional capacity indicators outlined in the introductory presentation will be subsequently demonstrated.

Lindsay Bottoms

The physiological responses to competitive handcycling
The final presentation will apply the underlying physiological responses of upper body exercise, and specifically arm crank ergometry, to the emerging sport of handcycling. This presentation will highlight how this innovative sport can be used to facilitate rehabilitation and help maintain levels of fitness in individuals with physical disabilities. The presentation will provide an opportunity to demonstrate how laboratory based research into arm crank ergometry can be applied specifically to sport. In covering the physiological demands of handcycling competition, field and laboratory testing and aspects of sports science support for handcyclists delegates will receive an awareness and understanding of one of the newest Paralympic sports. This is particularly timely as
following the inclusion of handcycling as a demonstration event within the 2008 Paralympic Games in Beijing, London 2012 will be the first Games to include handcycling within the full competitive athletics timetable. The presentation will also consider recent data collected during the ‘Race across America’.

Paul Smith

SS5

The Impact of Blood Profiling on Optimising Performance and Wellbeing in Elite Athletes
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sportscotland institute of sport, United Kingdom

Blood profiling of biochemical parameters, haematology, iron and lipid status is routinely carried out in the elite athlete population serviced by the sportscotland institute of sport. Blood profiling can identify indicators of decreased performance caused by fatigue and overtraining before they are demonstrated by the athlete. It can also assist in the return to optimal performance as well as monitoring athlete’s general health and wellbeing. Previous research has shown that iron depletion and anaemia occurs more frequently among athletes than in the general population (Koehler et al., 2011) and in turn may affect performance capacity (Della Valle & Haas, 2011). Furthermore, several recent studies have shown low levels of vitamin D among athletes (Willis et al., 2008), particularly in those who have low levels of sun exposure in their natural training environment. This presentation will discuss the introduction of a blood monitoring system within the sportscotland institute of sport which allows the comparison of data and normative values for each athlete at predefined stages of the season. Case studies from athletes from a variety of sports will be presented for routine blood measures including Ferritin and Vitamin D. This presentation will also consider the preparation for, and the responses to, altitude training (2130m) in elite swimmers.

Willis, KS; Peterson, NJ and Larson-Meyer, DE. Should we be concerned about the vitamin D status of athletes? Int J Sport Nutr Exerc Metab. 2008; 18: 204-224

SS8

Exercise Biochemistry
Brooks, GA*; Khanna, GL*; Kalinski, Mi*; Morozov, Vi
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The Ironic History of Lactate Metabolism
Once thought to be the consequence of oxygen lack in contracting skeletal muscle, we now know that lactate is formed and utilized continuously in diverse cells under fully aerobic conditions. In fact, as the product of one metabolic pathway (glycolysis), and the substrate for a downstream pathway (mitochondrial respiration), lactate can be regarded as the link between glycolytic and aerobic pathways. Importantly, this linkage can transcend compartment barriers and occur within and between cells, tissues and organs. Today, knowledge of lactate metabolism is understood to be important for at least three sets of reasons: [1] lactate is a major energy source, [2] lactate is the major gluconeogenic precursor, and [3] lactate is a signaling molecule with autocrine, paracrine and endocrinelike effects; it is a “lactormone.” “Cell-Cell” and “Intracellular Lactate Shuttle” concepts describe the roles of lactate in delivery of oxidative and gluconeogenic substrates as well as in cell signaling. Examples of the cell-cell shuttles include lactate exchanges between: white-glycolytic and red-oxidative fibers within a working muscle bed, working skeletal muscle and heart, brain, liver and kidneys. Examples of intracellular lactate shuttles include lactate exchange between plasma, cytosol and mitochondria as well as pyruvate for lactate exchange in
peroxisomes. Pyruvate for lactate exchange balances redox status, thus allowing peroxisomal b-oxidation. Lactate for pyruvate exchanges affect cell redox, and by itself, lactate generates ROS that have signaling functions. As well, lactate may affect metabolic regulation, for instance, by binding to G-protein receptors in adipocytes inhibiting lipolysis, thus decreasing plasma FFA availability. In cultured myocytes lactate accumulation upregulates expression of MCT1 and genes coding for other components of the mitochondrial reticulum in skeletal muscle. The muscle mitochondrial reticulum and mitochondrial networks in other aerobic tissues function to establish concentration and proton gradients necessary for cells with high oxidative capacities to utilize lactate. In contrast to its early portrayal as a metabolic waste product and poison, lactate production is part of a classic feedback loop by which short-term challenges to ATP supply stimulate glycolytic ATP production as well as the production of a rapidly used oxidative substrate that also signals tissue adaptations to stimulate lactate clearance in support of ATP homeostasis over the long-term. In vivo, lactate is a preferred substrate for cell respiration and high blood lactate levels down regulate the uptake and use of glucose and free fatty acids (FFA). Over the course of 100 years our understanding of lactate production and utilization processes has changed dramatically in diverse fields ranging from exercise physiology to tissue repair technology, neurosurgery and oncology.

George Brooks.

Effect of Spirulina Supplementation on Antioxidant Status of Athletes

Antioxidant supplementation is likely to provide beneficial effects against exercise-induced oxidative tissue damage. Recently, there has been considerable interest in the antioxidant properties of nutrients, that of vitamins in particular including vitamins A (beta carotene), C and E, having a crucial role in protecting cells from oxidative free radical damage. The significance of a blue green algae spirulina as nutrient rich supplement is extensively examined. However, its value in sports nutrition is not fully established. The aim of the present investigation was to study the effect of spirulina on serum antioxidant status and exercise induced oxidative stress of athletes in comparison to a commercial antioxidant supplement (CAS). Ninety male athletes in the age of 15-21 yrs were recruited. Among them, 45 subjects from aerobic exercise group and 45 subjects from mixed exercise group, further classified as Control group, Experimental group I (EGI) and Experimental group II (EGII) groups with 15 subjects in each group. The anthropometric measurements and dietary intake were assessed. Serum beta carotene, tocopherol, ascorbic acid, and malondialdehyde were measured. The CG did not receive any supplement. Spirulina (3g/day) for EGI and CAS (1capsule/day) for EGII was administered for 60 days. After supplementation, a repeat estimation of biochemical parameters was conducted. The supplementation of spirulina resulted in significant increase (p<0.05) in the levels of serum beta carotene, serum alpha tocopherol, plasma ascorbic acid and a significant decrease in the level of malondialdehyde in both the exercise groups.

Supplementation of spirulina improves serum beta carotene than CAS and confer protection against exercise induced oxidative stress.

Gulshan Khanna, Kalpana.K, Kusuma., Lal, P.

Exercise and Cellular Mechanisms of Muscle Injury

Strenuous exercise, in particular lengthening contraction, cause damage the contractile machinery and disrupt the integrity of the muscle cell membrane. The extent of muscle damage depends on the mode, mechanical loading, duration of exercise, age and gender. As a result of disruption of the muscle cell membrane, muscle proteins (e.g., creatine kinase, myoglobin) pass through the membrane into the bloodstream. The circulating concentrations of these proteins are commonly used as indirect markers of the extent of muscle damage. During and after exercise, leukocytes are mobilized into the bloodstream. Stress hormones (catecholamines, glucocorticoids) and cytokines are main leukocyte-mobilizing factors. Once mobilized, leukocytes travel to sites of muscle damage, where they induce inflammation and release destructive enzymes (e.g. proteinases, myeloperoxidase) and reactive oxygen species (ROS). These enzymes and ROS, along with muscle proteases, contribute to destruction and degradation of damaged tissue fragments. When produced in excess, however, leukocytes enzymes and ROS can induce collateral damage to healthy tissue. The mechanism of exercise induced muscle injury may include some sequential processes: mechanical disruption, impaired calcium signaling, activation of calcium-sensitive degradation pathways, oxidative stress, and inflammatory response. Ongoing research into contraction-induced muscle damage and inflammation will assist the scientific and medical community to continue to develop strategies that
An appropriate balance between inflammation and repair following muscle injury.
Michael Kalinski, Vladimir Morozov.

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IOC Initiatives on Injury and Illness Prevention in Elite Sport
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IOC, Switzerland

The IOC initiatives in prevention of injury and illness in elite sports
At a time when there is an abundance of medical meetings, journals and papers, some might argue that enough emphasis is put on prevention of injuries and illnesses. However, the work of the International Olympic Committee over the last four years in this field has convinced us that although the field of science is increasing year by year, the implementation of our knowledge still lags behind.

Is injury prevention important? Epidemiological studies show that of injuries seen by a physician in Scandinavia, every sixth is sustained during sporting activity(2). Among children, every third hospital-treated injury is the result of sports participation. A research group within the English Football Association found that the overall risk to professional athletes is unacceptably high—approximately 1,000 times higher among professional football players than for high-risk industrial occupations (3).

The second issue relates to the potential for new ideas and improved health. In May 2000, a PubMed search revealed that out of 10,691 papers on athletic injury, there were only 6 randomized controlled trials on sports injury prevention. However, a similar search of the literature now reveals that sports injury prevention research is emerging as a new field in medicine. While the number of papers on athletic injuries has increased by 26% over the last five years, clinical studies and RCTs related to sports injury prevention has doubled.

Sports participation is also important from a public health perspective. There is no longer any doubt that regular physical activity reduces the risk of premature mortality in general, and of coronary heart disease, hypertension, colon cancer, obesity, and diabetes mellitus in particular. The question is whether the health benefits of sports participation outweigh the risk of injury and long-term disability, especially in high-level athletes? Sarna et al. (4) have studied the incidence of chronic disease and life expectancy of former male world-class athletes from Finland in endurance sports, power sports and team sports. The overall life expectancy was longer in the high-level athlete compared to a reference group (75.6 versus 69.9 years). The same group also showed that the rate of hospitalization was lower for endurance sports and power sports compared to the reference group (5,6). This resulted from a lower rate of hospital care for heart disease, respiratory disease and cancer. However, the athletes were more likely to have been hospitalized for musculoskeletal disorders. Thus, the evidence suggests that although sports participation is beneficial, injuries are a significant side effect. To promote physical activity effectively, we have to deal professionally with the health problems of the active patient. This does not only involve providing effective care for the injured patient, but also developing and promoting injury prevention measures actively.

Since 2007 the International Olympic Committee is developing various programs for prevention of injuries and diseases in high level and recreational sports. This development is occurring with the cooperation of IFs such as FIFA, FIS, IHF, IAAF and FINA as well as with renowned research institutions worldwide. The Medical and Science Department of the IOC is currently developing research in the prevention field with several major institutions to focus on research, education and implementation of the new knowledge to all NOCs around the world. This strategy is highlighted through the IOC support of special issues of the British Journal of Sports Medicine. The Injury Prevention and Health Protection addendum to the BJSM under IOC leadership is dispersing new knowledge to the scientific community which again will help IFs and NOCs to implement new knowledge to the practical athlete. The IOC now has yearly Advanced Team Physician Meetings to educate our colleagues and a major conference every third year where researchers from around the world are discussing challenges and new results in the field of prevention of injuries and diseases. The IOC will continue the publication of the Olympic Encyclopedia and the more practical and very popular Olympic Hand Book in Sports Medicine. Every year at least two consensus conferences are conducted. Finally, the IOC has developed an injury and disease surveillance system for the Olympic Games- the first successfully conducted in Beijing, later on in Vancouver and now in London.
Through these initiatives, The International Olympic Committee (IOC) will increasingly emphasize the protection of the athletes' health and the prevention of injuries.
Torbjørn Soligard and Lars Engebretsen, IOC

Preventative Biomechanics: The Great Hope for Athlete Development
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The Role of Biomechanics in Injury Reduction
As athletes attempt to achieve the goals established in the Olympic Motto and strive to be 'faster' (citius), stronger (fortius) and go higher (altius), then greater loads will inevitably be placed on the bone and soft tissue structures of the body. An increased level of performance and the potential for injury are inevitably linked. However, biomechanics can play an integral role in reducing these loads. This symposia presents how biomechanics may play a role in reducing external loads on the body (Associate Professor Jacqueline Alderson: ‘Preventing Knee Injuries in Sport: Can We Influence Dangerous Knee Loads?’), while also providing a better understanding of how biological tissue responds to this external loading (Professor Gert-Peter Brueggemann: ‘Biological Tissue Response to Mechanical Loading in Sport - An Injury Reduction Model’).

Bruce Elliott

Preventing Knee Injuries in Sport: Can We Influence Dangerous Knee Loads?
The overriding principle required for sporting success at any level is to remain injury free. Indeed the sight of an athlete taking the pitch in a soccer game, entering a stadium to compete the final lap of a marathon or triumphantly lifting 260 kg, represents the end goal of a gruelling training journey years in the making. The ability of athletes to complete this journey is testament to their ability to stave off, overcome or withstand bone and/or soft tissue injuries which occur when forces applied to biological tissue are greater than that tissues ability to accommodate such load. However, tolerating applied loads is an inevitable component of sporting participation, with a minimum level of loading also necessary for training adaptation and to facilitate tissue and bone remodelling. A fine balance must be achieved in terms of beneficial load exposure and reducing injury risk.
Biomechanical in-vivo and cadaveric evidence in the area of anterior cruciate ligament (ACL) injury has identified that it is the combination of tibio-femoral compression, anterior tibial translation, and valgus and/or internal rotation knee moments that elevate ACL strain and expose it to the greatest risk of injury. Experimental investigations show that the ACL risk is greatest during the weight acceptance phase of sidestepping and single-leg landing. A primary avenue to reduce ACL injury risk is to change an athlete’s technique to reduce the external joint loading that serves to compromise the ACL during this phase. This presentation will examine a number variables and intervention practices, with specific focus on neuromuscular training, action-perception coupling and a variety of technique modifications, which have been found to influence external knee loads associated with increased anterior cruciate ligament injury risk.
Jacqueline Alderson

Biological Tissue Response to Mechanical Loading in Sport - An Injury Reduction Model
Sport and exercise is typically linked to increased functional capacity of the musculo-skeletal system. But acute and overuse injuries and finally tissue degeneration indicate the vulnerability of biological structures to overuse through greater mechanical loading in elite sports. Therefore a critical review of the mechanisms of tissue response to mechanical loading during physical activity on both a macroscopic and cellular level will increase the general understanding tissue damage, maintenance or plasticity related to mechanical stimuli. The response of biological tissue to mechanical loading in elite sport and highly loading exercise is of vital interest in sports biomechanics, athletic training research, and especially the development of an injury reduction model in elite as well in recreational sports. Bone loss, articular cartilage damage and joint disease will build the focus of the critical analysis of the experimental results of the tissue response to single and repetitive load applications in a short and a long term perspective. The response of bone and articular cartilage to mechanical loading in the long term
indicates a strong association to the loading patterns for the response of bone but not for that of cartilage. For the short term recent experimental results provide evidence on different articular cartilage responses related to loading regimes. The presentation will critically discuss reported results of the risk of overuse through mechanical loading as well as the potential of bone and cartilage to adapt as a function of load applied at different amplitudes, directions of force application, loading frequency and duration as well as pauses between loading periods. An attempt to derive an overuse reduction model as function of exercise related loading and subject specific prerequisites will be presented.

Gert-Peter Brüggemann

Historical Aspects of Doping and Anti Doping: The Failure of Policy and Morality
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1 University of Münster, Germany; 2 University of Stirling, United Kingdom; 3 University of Texas, United States; 4 Aarhus University, Denmark

Doping in West Germany During the Cold War Period
This paper will deal about the situation in West Germany during the Cold War period which can be considered as the formation period of modern doping as well as anti-doping in this country. First, there was an inflation of potential performance-enhancing substances since the interwar period due to the scientific progress in pharmacy, biology, chemistry, medicine, and their industrial production. As a result doping became an elastic and blurred concept which raised the central question of an exact definition of doping for separating legal dietary supplements from illegal doping substances. Second, the development of sports medicine as a specialized medical discipline applied to high performance sports produced a new group of scientific experts highly involved in the doping problem. Together with trainers and sport officials they played a key role in the athlete’s networks. Third, the increasing use of anabolic steroids in sports since the 1960s changed doping fundamentally. Their use, effects and side effects differ significantly from stimulating doping substances used in earlier times. The way of dealing with anabolic steroids was controversy in West Germany. The year 1977 marks an important step in this question. Fourth, these processes took place within an increasing process of commercialization, professionalization and politization of sports. The Cold War and the special situation in Germany seems to have been a highly relevant factor for doping in West Germany.

Michael Krüger

Key Stages in the Development of International Anti-Doping Policies
This paper reviews the key stages in the development and modernization of international anti-doping policies and assess the reasons why historical practices have left so many contemporary challenges. Drawing from primary sources relating to the policies of the IOC and other sports organizations, alongside evidence of doping from the former East Germany and elsewhere, the paper will outline some of the critical factors in the failure of anti-doping policy to live up to the moralizing inherent in the creation, development and application of anti-doping ideologies. It will then explore the reasons for these failures and discuss the political, commercial and practical challenges involved in the campaign for drug-free sport.

Paul Dimeo & Thomas Hunt

Development and Change in the Attitude toward Doping
The development and change in attitude toward doping in one particular sport namely cycling which rightly or wrongly have become emblematic of the doping problem will be explored. The paper will show how developments and changes in attitude in the outer world have influenced attitudes the world of cycling albeit not unanimously. It will be argued that it is more than a coincidence that anti-doping regulations were enforced in the 1960s shortly after the world learned through the thalidomide catastrophe that advances in medicine may come with serious side-effects; and that there is an ongoing conflict of interest between those who want to embrace and benefit from scientific progress and those who are concerned about the unpredictable consequences of science and
campaign for a more cautious attitude in the use of drugs in sport.

Verner Møller

Media and Doping
This paper puts its focus on the media’s role in the fight against doping and how in recent years they believe the media is turning away from the doping story. American broadcaster Brent Musburger, for example, suggested in a lecture to journalism students at the University of Montana last fall that we should consider allowing professional athletes to use performance enhancing technologies if they so desire. Musburger’s comments are one of many recent examples that suggest a shift in the discourse on doping by the media. Particular attention will be paid to Sports Illustrated, the most prestigious of all American magazines, whose policies on doping appear to be changing in recent years.

Terry Todd & Jan Todd

The future of sports medicine in Europe
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RCSI and RCPI, Ireland

Sports medicine is a multidisciplinary clinical and academic speciality (and subspeciality in some countries) of medicine dealing with health promotion for the general population by stimulating a physically active lifestyle and diagnosis, treatment, prevention and rehabilitation following injuries or illnesses from participation to physical activities, exercises and sport at all levels. Sports medicine is globally defined and recognised not solely for taking care of the sporting elite athletes. It is mainly focused on:

- Prevention of chronic diseases caused by sedentary lifestyle as a major area of increasing interest which can partially be served by expertise in sports medicine.
- Pre-participation clinical screening and examination before exercise and competition as well as medical assistance to the athletes engaged in all sports.
- The use of supplements, pharmacological agents, doping control and gender verification and its complex moral, legal and health-related difficulties.
- Special medical issues associated with international sporting events of athletes, including disabled athletes, such as the effects of travel and acclimatization.
- Research in basic science and extensive clinical undertaken in the sports medicine domains within a great variety of specialties.

The increased attention from media and significant financial and political interactions in international sports events creates an atmosphere where business and sports meet, not always for the benefit of involved athletes. Consequently, sports medicine can encompass an array of areas including internal medicine, exercise physiology, cardiology, orthopaedics and traumatology, physical and rehabilitation medicine etc.

Rethinking the rationale for the fight against doping
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Doping is a complex moral and scientific dilemma and its prevention has led to a costly but less than perfect control system implemented worldwide by the World Anti-doping Agency (WADA). For a substance or method to be considered for the WADA Prohibited List three criteria are considered: (1) the substance or method has the potential to enhance, or enhances, sport performance (2) use of the substance or method represents an actual or potential health risk to the athlete, and (3) use of the substance or method violates the ‘spirit of sport’. The ‘spirit of sport’ is defined by references to a series of general values ‘...the celebration of the human spirit, body and mind’ and explained with reference to a series of ideal values: ethics, fair play and honesty; health; excellence in...
performance; character and education; fun and joy; teamwork; dedication and commitment; respect for rules and laws; respect for self and other participants; courage; community and solidarity. These values do not lend themselves to clear-cut interpretation and are of little help in drawing unambiguous lines in concrete cases. A proposal is made of how to interpret ‘the spirit of sport’ in more precise ways in terms of a combination of the fair opportunity principle and a biological and evolutionary understanding of athletic performance as a result of the systematic utilization of the phenotypic plasticity of the human organism. The argument is that such understanding improves significantly the possibilities for line drawing when it comes to doping issues.

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Periodic Health Exams (Phe): Screening And Prevention Is The Key
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The Physician’s Perspective on Health Screening.
The Periodic Health Examination (PHE) is conducted in many forms and in many settings in sport. It may be performed for the reasons of pre-participation screening to detect pre-existing medical conditions that place the athlete at risk in exertion or competition. It may be conducted to detect factors that would place an athlete at increased risk of injury. Such screening may be to exclude an athlete from participation, but more commonly is used to intervene with preventive programs. Apart from screening, the PHE can also be done at regular intervals to monitor the health status of athletes as they are placed under training and competition loads. The physician’s perspective will be given as it applies not only to the elite athlete, but will also touch on principles that can be used in developing athletes and youth.

Willem Meeuwisse

Screening and prevention from the physiotherapist’s perspective.
When working with athletes our main goal is to keep the athlete healthy, prevent injuries, treat injuries that occur and rehabilitate them as fast and safe as possible. Several studies have shown that it is possible to prevent lower extremity injuries in several team sports. However, there is limited knowledge about who are at increased risk for an injury. In relation to prevention of ACL injuries it seems to be important to avoid knee valgus position. Several studies are looking for risk factors that can help us to pick out those at increased risk. The talk will present the knowledge we have regarding screening of athletes and present what type of exercise programs that prevents injuries.

Grethe Myklebust

The Role of the Exercise Physiologist in Health Screening and Monitoring.
As one component of an integrated support team (IST) providing services, advice, and even direction to a high performance unit, team, coach, or athlete, an exercise physiologist can ‘value add’ in a number of critical areas. Typically, these areas will focus upon i). the foundation or base level health ‘platform’, ii). the effect or response to the ongoing training environment, iii). the approach to major competition, iv). dealing with the competition situation itself, and v). the recovery period following competition and the return to a foundation point. In all scenarios, the exercise physiologist will be acting in concert with other service providers, as well as the coaching/performance staff of the sport in question. This presentation will focus on the process of this activity.

Stephen Norris
What Can be Done to Minimise the Risk of Illness in Elite Athletes?
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Monitoring of Athletes – Are There Any Biomarkers of Infection Risk?
There is reasonable evidence that upper respiratory illness (URI) episodes cluster around competitions and are associated with decreased performance. However, being able to accurately predict which athletes will succumb to URI and when remains a significant and, as yet, unresolved challenge; this remains the “holy grail” for exercise immunologists. There are numerous aspects of immune function that can be measured but the only ones that have, to date, shown some relation to URI risk in athletes are saliva secretory immunoglobulin A (SIgA) levels and blood cytokine responses to exercise or antigen challenge. Levels of SIgA fall during periods of intensified training and decreases in SIgA concentration or secretion rate are associated with increased risk of URI. Thus, regular monitoring of SIgA over a training season (possibly with concurrent measurement of saliva cortisol and testosterone concentrations) may have some value in predicting URI risk. There are various training, lifestyle, hygiene and nutritional strategies that can help to minimise URI risk and these should become part of the athlete’s normal routine.

Michael Gleeson

Impact of Exercise on Immune Function and Infection Risk
There is now substantial evidence to support the notion that prolonged strenuous exercise is associated with a transient suppression of immune functions which usually recover within 24 hours. However, in situations of intensive training a lack of sufficient recovery between exercise sessions can lead to chronic depression of immune responses. It has been suggested that such effects on host defence account for the apparent higher incidence of upper respiratory and gastrointestinal illness among highly trained athletes, leading to absence from training and impaired performance. While it is certainly true that symptoms of respiratory and gastrointestinal illness are commonly reported in athletes, an infectious cause of these symptoms, particularly with regard to respiratory illnesses, has not always been confirmed. This has led to some debate among exercise immunologists regarding other/additional causes of these symptoms.

Nicolette Bishop

Practical Strategies to Limit Illness Risk in Athletes
The aim of this presentation is to provide support staff with up-to-date information about appropriate strategies to limit illness risk in their athletes. The main take-home messages from this presentation are:

- Provided the athlete consumes a well-balanced diet that meets energy needs the intake of macronutrients and micronutrients will be sufficient to maintain immune health.
- Even short durations of energy restriction lasting only 1-2 days decrease immune function (e.g. an athlete making weight for competition).
- Carbohydrate ingestion during exercise or shortly after exercise can attenuate the immune impairment.
- A high carbohydrate diet will not only optimise athletic performance but may also decrease the immunosuppressive effect of stress hormones.
- Athletes on energy restricted diets should consider a low-dose multivitamin supplement.
- Current evidence supporting the use of immunostimulants to prevent or treat common infections in athletes is limited.
- The psychological stress an athlete experiences may decrease immune function but encouraging preliminary evidence indicates that psychological interventions can improve immune function and reduce infections in athletes.
- Missing a night of sleep has little effect on immune function at rest or after exercise but recent work indicates that the common cold is more prevalent in those who experience poor sleep quantity (< 7 hours per night) and poor sleep quality (frequent awakenings).
Medical staff should consider appropriate immunisation for their athletes particularly when travelling to international competitions.

Athletes and support staff can avoid transmitting infections by avoiding close contact with those showing symptoms of infection, by practising good hand hygiene, oral hygiene and food hygiene and by avoiding sharing drinks bottles and cutlery.

Neil Walsh

Symposium Title: What’s The Point Of Restricting The Use Inhaled β₂-Agonists In Elite Athletes?

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Are anti-doping measures successful in limiting the misuse of inhaled β₂-agonists whilst ensuring effective therapy of respiratory conditions?

From an anti-doping perspective the status of inhaled β₂-agonists has changed over recent years in part reflecting the research that has been conducted within this area. Whilst inhaled terbutaline remains prohibited in competition several other common inhaled β₂-agonists, such as salbutamol, salmeterol and formoterol are permitted for therapeutic use. Whilst there remains much conjecture regarding the reputed performance enhancing properties of inhaled β₂-agonists there is an attempt by the anti-doping movement to ensure effective therapy for those athletes suffering from respiratory conditions. These measures are in part reflected in the therapeutic use exemption (TUE) process which enables athletes with legitimate medical conditions to use substances or methods on the WADA Prohibited List that may otherwise result in an anti-doping rule violation and; the introduction of urinary thresholds to differentiate misuse from recommended therapeutic use. This presentation will attempt to provide some rationale to support or otherwise the implementation of both the urinary thresholds and TUE programme with respect to inhaled β₂-agonists.

Neil Chester

The evidence for performance enhancing effects of inhaled β₂-agonists?

β₂-agonists have been banned in sports since the first Prohibited List of doping substances was published in 1967. Originally they were seen as a stimulant, but since 1993 they have also been regarded as anabolic substances because of their potential systemic effects. Since the 1980s they were already permitted “in the aerosol form” but ever since the rules regarding granting exemptions for use based on therapeutic requirements changed regularly. These changes in anti-doping rules reflect the controversies that remained as to which degree these substances actually possess performance enhancing effects for athletes. Nearly 30 years of research did not provide an unequivocal conclusion on this issue, so in 2009 a systematic review and meta-analysis was conducted. Twenty-six studies involving 403 non-asthmatic participants (age range 7–30 years) compared inhaled β₂-agonists with placebo. No significant effect could be detected for several performance indicators (both anaerobic and aerobic). In contrast, there is some evidence indicating that systemic β₂-agonists may have a positive effect on physical performance in healthy subjects, but the evidence base is weak. These results support doping regulations in which all inhaled β₂-agonists are permitted to be used by athletes up to the maximally allowed therapeutic dosage.

Olivier De Hon

Let’s not go backwards – dealing with respiratory symptoms in elite athletes.

Elite athletes with exercise induced bronchoconstriction (EIB) use inhaled β₂-agonists as effective reliever therapy to treat acute bronchoconstriction. Between 2002 and 2010 Olympic athletes had to provide evidence of asthma and/or exercise induced bronchoconstriction in order to use inhaled β₂-agonists. Over this period the restriction of inhaled β₂-agonists led to the improvement in athlete care on respiratory issues within the Great British Olympic team. The 2012 World Anti-Doping Agency (WADA) list of banned substances currently does not restrict the therapeutic use of inhaled salbutamol, salmeterol or formoterol. Reverting back to the reduced restrictions on the use of inhaled β₂-agonists by elite athletes may lead to increases in athletes using the therapy inappropriately.

Although the reduction in the restriction on inhaled β₂-agonists will lead to a reduction of paper work, we need to
retain the improvements in athlete care that have been made. This presentation will specifically cover diagnosis of EIB in athletes, mis-diagnosis of EIB in elite athletes, treatment available to athletes and the problems associated with the sole use of inhaled β₂-agonists.

John Dickinson

Exercise, immune function and infection: issues for Olympic and Paralympic Athletes.
Goosey-Tolfrey, VL; Bishop, NC*; Leicht, C*; Gleeson, M*
Loughborough University, United Kingdom

Mucosal Immune Function and Infection Risk in Elite Able-bodied Athletes
It is now widely accepted that single bouts of prolonged strenuous exercise are associated with a temporary suppression of many aspects of immune function and this may provide a ‘window of opportunity’ for infections to enter the body. These effects may be cumulative over a period of time, so that during periods of heavy training and competition, athletes’ immune systems may become chronically suppressed. Decreased secretion rate of salivary markers of mucosal immunity, and in particular salivary secretory immunoglobulin A (sIgA), have been related to training load and perception of fatigue and implicated as risk factors for subsequent episodes of respiratory infection in athletes. Iga is the predominant antibody in mucosal secretions and acts with innate mucosal defences such as alpha-amylase, lactoferrin and lysozyme to provide the ‘first line of defence’ against pathogens and antigens presented at the mucosa. As such, sIgA is suggested to be a useful biomarker of infection risk in athletes. This presentation will focus on the mucosal immune response to exercise training and present some of the suggested mechanisms underlying this response.

Nicolette Bishop

Mucosal Immune Function in Wheelchair Athletes
By far the majority of research in the area of exercise immunology has focused on able-bodied athletes and until recently, only few studies have investigated mucosal immune responses in wheelchair athletes. Some of these individuals have high level spinal cord injuries (SCI) that can affect their sympathetic nervous system (SNS), and as a result, alter their mucosal immune response to exercise. However, despite missing central control, these wheelchair athletes show responses thought to be governed by the SNS, such as reductions of saliva flow rate as a result of strenuous exercise. Similarly, chronic exercise responses in athletes with high level SCI are comparable to able-bodied athletes, as decreases in markers of immune function during periods of heavy training have been reported in both populations. It therefore appears that the loss of central control of effector organs via the SNS may be compensated. This may be by way of enhanced spinal reflex activity, adapted parasympathetic nervous system activity, or increased sensitivity of receptors involved in autonomic pathways.

Christof Leicht

Monitoring of Athletes to Reduce Infection risk
Heavy schedules of training and competition appear to increase the risk of upper respiratory illness (URI), such as sore throats, colds, and ‘flu. Insufficient recovery from these illnesses can lead to recurrent URI episodes that could cost an athlete days or even weeks of vital training and could ultimately make or break a successful season for an individual or a team. Although there are several possible mechanisms for these increased episodes of URI, it has been suggested that infections may result from a reduction in the levels of the main antibody found in saliva, tears and mucous: immunoglobulin A (IgA). As athletes become more stressed through repeated competition, training and inadequate recovery the secretion of the adrenal glucocorticoid hormone cortisol is increased whereas that of the sex steroid testosterone falls. The ratio of cortisol to testosterone is therefore a sensitive index of stress and can be assessed in saliva samples. Several longitudinal studies in athletes and games players have examined the potential value of regular salivary monitoring of sportsmen during critical stages of the season.

Michael Gleeson
Role of Inflammation In Exercise
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1Loughborough University, United Kingdom; 2University of Liverpool, United Kingdom; 3Queen Mary College University of London, United Kingdom

Anti-inflammatory Mechanisms of Exercise
Regular exercise reduces the risk of chronic metabolic and cardio-respiratory diseases, in part because exercise exerts anti-inflammatory effects. However, this could be responsible for depressed immunity in the elite athlete. The anti-inflammatory effect of regular exercise may be mediated via both a reduction in visceral fat mass (with a subsequent decreased release of adipokines) and the induction of an anti-inflammatory environment with each bout of exercise. Various mechanisms may contribute to the anti-inflammatory effects of exercise including increased release of IL-6 from working skeletal muscle (which induces secretion of IL-1ra, IL-10 and CRP and so has generally anti-inflammatory effects), increased release of cortisol and adrenaline from the adrenal glands, reduced expression of TLRs on monocytes/macrophages, inhibition of monocyte/macrophage pro-inflammatory cytokine secretion and infiltration into adipose tissue, phenotypic switching of macrophages within adipose tissue, a reduction in the circulating numbers of pro-inflammatory monocytes and an increase the circulating numbers of regulatory T cells. At present we do not know what the relative importance of the different anti-inflammatory mechanisms that have thus far been identified are, though it seems likely that this will depend on the modes, frequencies, intensities and durations of exercise performed.
Michael Gleeson

Tendinopathy in Obesity and Elite Athletes, Recent Understandings and the need for Evidence Based Medicine in Autologous PRP Biological Therapy.
Tendinopathy is serious in elite sport and has is a positive correlation with athletic activity as well as systemic inflammation in obesity. Recently, it is considered an atypical relationship exists between inflammation, a failed healing response, and failed recovery of structural integrity. This may be accompanied by a low grade chronic inflammation, exacerbated by repeated microtrauma. NSAIDs are ineffective, but autologous PRP is thought to be. The scientific bases of this biological therapy are multiple, and it is critical that the biological factors involved are identified. There is a clinical demand for evidence based medicine to identify the optimal formulations and protocols before this technology is incorporated into routine clinical care.
Nicola Maffulli

Skeletal Muscle Oxidants and Stress Proteins in Exercise and Ageing.
A fuller understanding of the contrasting roles of oxidants and heat shock proteins is needed to design strategies to maintain and optimize skeletal muscle (SM) function during exercise and to help prevent sarcopenia and other muscle-wasting conditions. SM generates reactive oxygen species (ROS) during contractions. Superoxide generation is a mitochondrial oxygen consumption by-product and was considered a major source of muscle-damaging ROS. Recent data contradicts both of these possibilities. Advanced analyses show specific ROS generation is controlled by SM fibres and are important for muscle adaptation to contractions. These include contractile performance optimization and key changes in gene expression. These positive benefits of ROS contrast starkly with evidence that ROS-induced degeneration is fundamental to aging processes in skeletal muscle.
Malcolm Jackson
Glasgow 2014: Medical Support of High Performance Athletes
This lecture will present the role of the Head of Sports Medicine in the Sportscotland Institute of Sport which is the High Performance arm of the Government Agency for Sport. It will discuss the injury and illness issues of 600 plus high performance athletes. Discuss prevention challenges, monitoring aspects and the nature of the role of a doctor in a multi-disciplinary team.

Brian Walker.

Disability Sport in Scotland
Historically, Scotland has played an important international role in the advancement of disability sport. Whilst global participation increases on an annual basis, this trend is not currently reflected within Scotland. This presentation shall explore factors limiting national classification, and propose initiatives to improve participation at both grass roots and elite levels. This is of paramount importance if the expected benefits of London 2012 and Glasgow 2014 are to be realised.

David White.

Exercise Is Medicine - The Potential for Scotland
‘Exercise is Medicine’ is an American College of Sports Physicians initiative which aims to make activity assessment and prescription a standard part of disease treatment and prevention. This presentation outlines the potential impact this could have in Scotland by reviewing the current levels of chronic disease and ill health which evidence shows can be significantly improved by increasing physical activity levels. It highlights how physical inactivity has become a major health problem within Scotland.

Michelle Jeffrey.

Physical Activity In Glasgow
Glasgow has a poor record on health, morbidity and mortality. Physical inactivity is the fourth leading risk factor for global mortality. The Scottish Government recommended the following physical activity guidelines for adults: Moderate intensity exercise for 30 minutes/day on five days of the week or Vigorous intensity exercise for 20 minutes/day on three days of the week. The target is to have 50% of the adult population in Scotland achieving these standards by 2022. Only approx. 40% of the Glasgow population currently reaches these physical activity requirements. For the physical activity target of 2022 to be achieved, radical changes in the Scottish psyche and behavioural patterns will have to occur at individual, local (council) and national (government) levels.

Stephen Boyce.

Physical Activity Legacy of Glasgow 2014
Scotland has been inhabited for 12000 years. The early hunter gatherers were active in their bid to survive. More recently Scots have invented the 3 best friends of the couch potato- the TV, telephone, and fridge. Physical Inactivity is a global problem, and one that requires tackled directly. The Scottish Government are clear in their aims for the Commonwealth Games, namely to leave a legacy of a healthier more active nation, and to win as many medals as is possible.

Andrew Murray.
Games Federation and International sports federations specific requirements, the setting up of a Polyclinic in the Games village for athletes and support staff, the medical facilities at training and competition venues and the provision for workforce, media and spectators. Finally John will outline the structure for medical volunteers for what will be Scotland’s greatest ever sporting event.

John MacLean.

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UK Sport/English Institute of Sport (EIS) Injury/Illness Surveillance Model
Palmer-Green, Debbie*; Palfreeman, R*¹
¹University of Nottingham, United Kingdom; ²UK Sport, United Kingdom

Methods for Epidemiological Study of Injury and Illness in Olympic Sport: The Injury/Illness Performance Project (IIPP)
Prevention of injury and illness in elite sport can have not only athlete health benefits but also potential positive performance gains. As the first step towards prevention, valid, sensitive and bespoke injury/illness multisport surveillance data is needed to provide incidence, severity, nature, and risk factors for injury/illness in both individual and team sports.
The injury/illness performance project (IIPP) provides a methodological framework adapted from recent injury surveillance consensus statements, presenting new insightful, exposure related, athlete injury and illness longitudinal information in elite sport in Great Britain. Helping to identifying existing and emerging issues of greatest burden to athletes, in terms of time lost, and causation.
Provision of sport specific objective information to medical and coaching support staff, has enabled elite sports in Great Britain to start to implement prevention initiatives for key areas of injury/illness risk. The long term aim being to reduce the number and severity athlete injuries/illnesses, the detrimental effects of time loss and restriction in training and competition, and ultimately through this enhance athlete performance.
Debbie Palmer-Green

Strategies to Reduce the Risk of Infectious Illness
Whilst there are well-established treatments for many of the more serious infectious illnesses, the number of interventions available for common respiratory and gastrointestinal complaints remains limited. As such, prevention remains the main strategy to reduce the burden of infectious illness in a sporting population. There are two main components to this approach -- reducing the risk of transmission and maintenance or enhancement of immune function.
Transmission of infection can be reduced by knowledge of the common modes of spread of the various infectious agents and, in particular, the avoidance of high risk situations. A key factor is the maintenance of hand hygiene by the use of hand sanitisers, especially using products which maintain some residual antimicrobial activity after application. Additional measures include keeping hand contact with the eyes, nose or mouth to a minimum and appropriate distancing from sources of infection.
There are several possible interventions for improving or maintaining immune function in the athlete; Training load should be carefully monitored and this needs to be balanced with adequate recovery and, in this regard, sleep quality is of particular importance. Several nutritional strategies also show promise, including the use of certain probiotic products and ensuring adequate vitamin D status. Immunisation plays a key role and there are a several vaccinations that should be considered in addition to the more commonly recommended seasonal influenza inoculation.
Roger Palfreeman