

ACSMMS 2011

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photos plus more**

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Can the brain be manipulated?

Breasts & sport

Are they a problem?

- Interview with Jeff Hendra, Lead Physical Therapist, PGA Tour
- Why so many decisions in professional sport are subjective
- Reaching beyond our research comfort zones
- Sports injury prevention: Maximising the public health benefit
- Searching for the holy grail: Wallabies athlete load monitoring
- Rash diagnosis: Inflammatory arthritis presenting in athletes

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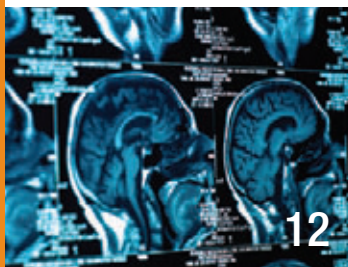
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A happy engagement



Nello Marino is pictured with Mark Doherty, General Manager of Product, ASICS Oceania Pty Ltd, at the recent Australian Conference of Science and Medicine in Sport in Fremantle where a new five year contract was announced, taking the SMA/ASICS partnership through to the year 2017.

If you have a worthy cause or issue related to sports medicine or physical activity that you would like promoted in *Sport Health* via a promotional item, e.g. hat, t-shirt, mug, email nello.marino@sma.org.au

SMA CEO, Nello Marino reflects on the recent SMA National Conference and looks to the organisation's future.

Having only just delivered the 2011 Australian Conference of Science and Medicine in Sport in Fremantle WA, it's very easy to feel buoyed by another wonderful embodiment of the SMA spirit. Whilst formal evaluations are yet to be completed, it was apparent that members were enthused by the quality of the program and the usual great sense of camaraderie that is typical of SMA conferences.

But what is it that makes it so special? Many of our delegates are seasoned conference campaigners, attending numerous such events each year, all over the world. The consistent feedback from these frequent flyers is that the SMA conference is far more relaxed and accessible, as well as being far more fun than many other similar events across the globe.

It would be easy to suggest that it's simply about putting on a few more social events plied with enough alcohol to give everyone a warm fuzzy feeling reflective of a love-in. However I think this would be a somewhat simplistic explanation, failing to recognise the key ingredients that make SMA and the SMA conference special.

I heard a wonderful Fellowship acceptance speech made by Professor Peter Terry (a sport psychologist based at the University of Southern Queensland) at the Fellows dinner. Peter spoke both humorously and very warmly of the honour of being awarded ASMF Fellowship. However it was his description of one of his first experiences at an SMA conference or event that resonated most. He suggested that the great thing about SMA, which was unlike any other professional association he belonged to, was that 'people left their ego at the door' when they came to SMA events. This was the critical ingredient that enabled the truly multidisciplinary nature of SMA events to be so successful and enabled everyone to participate in comfort.

There were also a number of other factors that contributed to this event being all the more special. It's been a number of years since I've had the pleasure of seeing a number of the luminaries of SMA at the one event. I'm speaking of practitioners who were instrumental in the formation of the organisation and for laying the foundations of the organisation we have in place today. People such as Professor Ken Fitch, Dr Brian Sando, Professor John Bloomfield and Mr Stuart Gray (and my apologies if I've missed anyone) whose presence was front and centre.

We were delighted to have Professor Ken Fitch present the Refshauge Lecture and he did so like the old pro that he is. I was staggered to learn of Ken's age at the conference (your secret is safe with me Ken) and was in awe of his prowess at the podium when presenting a historical summary of Asthma and its treatment over the past 50 years. The presentation was made all the more poignant due to the fact that Ken knew Sir William Refshauge and was able to give a genuine and fascinating first hand reflection on William Refshauge 'the Man'.

We were also very touched to have Dr Brian Sando at the conference, particularly given it was announced that one of the SMA Research Foundation grants is to be named in his honour as of 2012. The 'Dr Brian Sando Clinical Sports Medicine Award' will be awarded for the first time in 2012 as a means of encouraging research which contributes to clinical sports medicine. The announcement was made all the more

special following a few words by Ken Fitch who many would be aware is a long time friend of Brian.

This may sound like a sentimental walk down memory lane to many. However moments such as these are few and far between. The SMA conference apart from being a brilliant SMA tradition is actually a testament to the wonderful work that was done in the founding years of the organisation and embodies the multidisciplinary structure that I am well aware that many of these founding members fought so hard for.

But not to rest on our laurels we must ensure that SMA continues to thrive. This is key to the reason the SMA National Board, led by Tim Pain have agreed to continue to consult with the membership on the OneSMA proposal which Tim flagged at the SMA AGM in 2010 and which he featured in his article in the Winter 2011 issue of *Sport Health*.

Many would be aware that the proposal is for the current federated structure to be merged to form a single governance structure, led by a national skill-based National Board. The SMA Board with our independent Business Advisors, believe that this change is crucial to the ongoing success and growth of SMA, and we have spent the last year gathering concerns and feedback, and working on details on what this means.

However it should be stressed that it is the members that will decide on the future direction of SMA through their vote at an AGM. The OneSMA proposal will be tabled at the 2012 AGM in November. It is imperative that members be given the opportunity to understand what OneSMA proposes, how it will be implemented and most importantly how it will benefit the members.

To date the consultation has taken place at the State Board level and much robust discussion has taken place. Lots of feedback and advice has been provided which has shaped much of the concepts and structures that are being proposed. The next step is to provide members with relevant details to enable an informed decision to be made in 12 months time.

Members will very shortly be receiving information which will assist in this. It is critical that members provide their opinions and advice on how the structure could be shaped. Information on the proposed structure will be via printed, electronic and face to face mediums. Members will be given the opportunity to air their views via forums, online chat facilities and in more traditional forms such as mail.

All that is asked at this stage is that members engage in this process. As my stories above outlined – from our foundation we have been a multi-disciplinary member-based organisation

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Every week 85 Aussies have a lower limb amputated due to diabetes. Check-ups can prevent this. Foot Health Month Oct 2011

<http://bit.ly/rlnsxw> – October 5, 2011

Good month to get walking. To help get you prepared to get the most out of walking and avoid injury see

<http://bit.ly/qXyrzU>. #Walktober – October 3, 2011

Interesting study that has found kids get more exercise when parents step back

<http://bit.ly/qKLhoR> #SMAresearch – September 20, 2011

Employees who walk 10,000 steps a day and do gym workout 3 x week can give employer extra \$2500 productivity a year

<http://bit.ly/rhBLuu> – September 15, 2011

Latest JSAMS free paper: Why does Aus have higher rate of knee reco surgery than NZ & what can we do about it?

<http://bit.ly/plrRKc> #JSAMS – September 13, 2011

New Adult Pre-Exercise Screening System Tool available for development of suitable exercise programs and fitness advice

<http://bit.ly/nGMSXW> – September 6, 2011

SMA with Defib Your Club, For Life! is calling for the mandatory placement of defibrillators in all sporting clubs

<http://bit.ly/oERFUG> – September 2, 2011

Asthmatics will be better informed of safe and effective exercise with new position statement released

<http://bit.ly/owfiLq> – September 1, 2011

Planning on hitting the slopes? Sports Medicine Australia encourages you to be well prepared for skiing/snowboarding

<http://bit.ly/nglBsu> – July 25, 2011

SMA spokespersons on ABC Radio National this morning talking on how more can be done to prevent sports injuries

<http://bit.ly/nimGmE> – July 20, 2011

– and therefore we need this great organisation to evolve with the input from as wide a cross section of stakeholders as possible, not through the voice of a few.

Nello Marino

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5 mins with... Kay Copeland

Physiotherapist, 2011 ACSMS Conference Committee Conference Chair and ASMF Fellow



How many years have you been in physiotherapy?

I have been a practicing physiotherapist for 18 years after graduating in 1992. I had returned to study physiotherapy as a mature age student after completing a degree and masters in physical education.

My degree in Physical Education was at Footscray Institute of Technology (now known as VU). My Masters was at Indiana State University where I also studied Athletic Training and qualified in the USA as a Certified Athletic Trainer – and was the first Australian who achieved this. My interests in sports medicine started with Athletic Training and it lead me to complete physiotherapy when I returned to Australia.

Where do you work?

I am full-time at Alphington Sports Medicine Clinic which is a large multidisciplinary sports medicine clinic in Melbourne. I am also a contractor for the WTA (Women's Tennis Association) as a physiotherapist and on the Board of Australian Water Polo Incorporated.

What does your typical day consist of?

My typical day at Alphington Sports Medicine Clinic is seeing patients and completing my paperwork. One or two mornings a week I work from home keeping up to date with my other roles – Conference Chair, Board Member.

What is your favourite aspect of your job?

I have two favourite aspects. One is the problem solving and lateral thinking required for difficult cases. The other is the delight and joy people have when you are able to help them achieve their goal – whether it be to play in a grand final or be able to walk down the street without pain.

It would also be unfair not to say that working in elite sport is a very special and unique experience that challenges you daily; you get to be with lots of great people and it takes you around the world.

What has been the highlight of your career?

Again I am going to cheat and have two highlights. The first was working for SMA-Victorian Branch. I started in 1987 when I returned home from Indiana State University as a Certified Athletic Trainer and was invited to join the SMA-Victorian Branch Sports Trainers Committee. This led to working for eight hours per week as the administrator for the Safer Sport Program and I left in 2004 as the Executive Officer. We had built SMA-Victorian Branch to a staff of six with a wide range of programs and successes.

The second was running the Medical Program for the 2006 Melbourne Commonwealth Games. I was the Medical Program Manager and whilst it was challenging, it was a great project. Dr Peter Harcourt was the Chief Medical Officer and we implemented a medical program with a number of new and innovative initiatives and showcased the sports medicine community of Victoria and Australia to the world.

And now I will cheat and have a third which is more sports oriented and that was working with the Australian Women's Water Polo Team as their Athletic Trainer when they won the World Championships in Madrid at the 1986 World Swimming Championships. It was the first time the women had been included so Australia were the first ever Women's World Champions.

Why and how did you become Conference Chair?

I have a strong passion for SMA as you can see from my work history with the organisation. I have been a Fellow for many years and always look for ways to be involved as I see SMA as being an excellent organisation for those who want to contribute to the sports medicine field and their own profession. I also was aware that the previous conference chairs were not going to continue after many years of outstanding work and felt that I could contribute to the growth and status of the conference.

What are you passionate about?

I am passionate about most of what I do so I find this a little difficult to answer without sounding like a 'Miss World' soundbite but would have to say – enjoying life, my family and friends and the work I do as a physiotherapist and in my voluntary positions. Oh – and world peace!

What's the best piece of advice anyone has ever given you?

"You should always go and do the things you fear most."

But I will cheat again – the saying below is stuck to my computer and I look at it most days.

"Life should NOT be a journey to the grave with the intention of arriving safely in an attractive and well preserved body, but rather to skid in sideways, champagne in one hand – strawberries in the other, body thoroughly used up, totally worn out, and screaming WOO WOO – what a ride."

Name four people, living or not, you would invite for a dinner party and why?

George Clooney, George Clooney, George Clooney, George Clooney!

Favourites

Travel destination: Everywhere.

Sport to play/watch: Water polo.

Cuisine: Just about everything – with alcohol.

Movie: Whatever makes me forget how long I have been on the plane.

Song: Mac the Knife.

Book: *Nice Girls Don't Get the Corner Office: 101 Unconscious Mistakes Women Make That Sabotage Their Careers* by Lois P. Frankel, PhD.

Gadget: Kindle.

ASMF Fellowship

ASMF Fellowship recognises SMA members for their work and contribution to Sports Medicine Australia and the wider sports medicine community.

Fellows play a big part in the promotion of excellence in the field of sports medicine, in encouraging young members' research and scientific endeavours and in recognising the contribution of members to SMA.

Fellows are required to have been a full member for at least seven years, attended Australian and international conferences, have research published in national or international publications, have higher tertiary qualifications, and assisted in the administration of some SMA projects and lecturing at workshops.

SMA encourages all those who fulfill these requirements to become part of this precious and fulfilling institution. Fellowship is something SMA members strive for and is a great way to be involved with the organisation and receive recognition for efforts in sports medicine.

SMA congratulates the latest ASMF Fellow inductee, Professor Peter Terry and those that received Certificates of Appreciation at the recent ACSMS 2011 conference (see page 41).

For more on ASMF Fellowship visit <http://sma.org.au>

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*Trish Wisbey-Roth, SMA Member
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Why so many decisions in professional sport are subjective



Dr J explores the subjectivity within the refereeing, coaching and medical worlds of professional sport.

I've just finished reading another new instalment from my favourite genre of books. The book is called *Scorecasting* (Moskowitz & Wertheim, scorecasting.com) from the genre I touched on in a past issue; sports econometrics (other names might include sabermetrics or sport analytics, pretty much it is any book that uses analytical statistics to explore trends in professional sport).

“There is a mentality that ‘the players should decide the outcome of matches, not officials’...”

The most interesting sections of *Scorecasting* relate to refereeing decisions in professional team sports. The authors make a convincing argument (with statistics to back up their argument) that the vast majority of home ground advantage relates to refereeing or umpiring bias. Having demonstrated this, they don't argue that it is actually bad. From an economic viewpoint, it makes a lot of sense for home teams to win more games than away teams. In terms of paying customers at the gate, home team fans make up the vast majority of the live spectators and if they go home happy 60 per cent of the time that may actually be preferable to 50 per cent of the time.

Scorecasting is an American book but the examples can be put into an Australian context. Let's assume that the same

assumptions apply to Australian sport – which I'd suggest but haven't done the analysis to prove it. If they do we would find that home teams and away teams statistically aren't any different in facets of the game that don't involve the officials, like accuracy in shooting for goal. The home team would have an advantage over the away team in segments of the game that involve rulebook subjectivity, like effective tackle percentage. When you attempt a tackle you need to approach it with the correct degree of aggression. If you are too timid, then your opponent might break the tackle. If you are too aggressive you might give away a penalty/free kick for an illegal technique. The rub is that in the heat of the moment, the officials need to decide whether a borderline tackle is legal or illegal. For any tackle remotely near the head or neck of a home player, the crowd will be screaming about the illegality of the tackle. There is close to silence for an identical tackle on an away player. The officials, being human, will consistently give a tiny bit more latitude to the home team due to the constant screaming of the fans. Across the duration of a game, this subtle extra latitude can turn a game between two evenly matched teams into a 60/40 proposition.

“Just as the sporting world is probably a better place due to subtle home team advantage, it is probably also the case that the fans enjoy a different interpretation of the rules in the dying minutes of a close game to the rest of the match.”



The authors use the sport of baseball to provide the best evidence of official bias. The 'strike zone' in baseball can be objectively analysed by matching the umpire's calls with the actual position of the pitch in relation to the batter and the plate. Pitches in the dead centre of the strike zone are generally called strikes no matter what the circumstances. It is the pitches right on the borderline that are called differently depending on the circumstances. When the pitch count is on three balls, a borderline pitch is more likely to be called a strike, but when the pitch count is two strikes, a borderline pitch is more likely to be called a ball. Superimposed on top of this situational bias is the reality that the home team gets slightly more borderline calls than the away team. The umpires are again human and subconsciously know that there will be a massive cheer if they strike out an away batter on a borderline call whereas they might be abused for doing exactly the same thing to a home batter. A borderline call (also known as a 50/50) is one which on replay can always be justified no matter what the initial call of the referee was and as all fans know they are common in all team sports.

“...the vast majority of home ground advantage relates to refereeing or umpiring bias.”

In *Scorecasting* the phenomenon of the square-up is analysed to a degree but the whole opening chapter is devoted to what is called 'whistle-swallowing'. This refers to the decisions of officials to make 'non-decisions' towards the end of close games. There is a mentality that 'the players should decide the outcome of matches, not officials' so that borderline or sometimes even blatant infringements go unpenalised in tight stages of crucial games to avoid the perception that one team was awarded the match courtesy of the officials. The best local illustration of this phenomenon I can think of was a 2010 NRL final between the Tigers and Roosters. The Tigers led by one point with less than a minute on the clock, but the Roosters had possession deep in attack and were threatening to steal the game at the last minute. Simon Dwyer, one of the Tigers defenders, aggressively tackled one of the Roosters players, Jared Waerea-Hargreaves just as he was charging at the line and almost knocked him out, causing the ball to jolt free. Depending on your bias this was either a blatant high tackle warranting an automatic penalty, or a borderline 'massive shot' which was a hair's breadth on the side of being legal. The situation of course meant that a call of a high tackle would have given the Roosters a shot for two points at goal, in front of the post, with the game ending in the anti-climax of a penalty.

“Would it be reckless for a doctor to allow a player to take the field for a Preliminary Final if the odds of permanent eye damage from that game were 1 in 1,000?”

Even though in other situations this may have been deemed a high tackle, it was deemed legal by the referees. What resulted was a scrum feed to the Tigers deep in their defensive zone with about 20 seconds left. As followers of rugby league would be aware, 99 per cent of the time the team with the scrum feed wins possession and the scrums are virtually uncontested. With their season on the line, the Roosters pushed heavily at the scrum and stole the ball as it was being fed. A combination of the whistle-swallowing phenomenon of the close game and the square up of the previous non-decision meant that the referees allowed the Roosters to do this and with their last minute possession they engineered a field goal and sent the game into extra time. Channel Nine’s Ray Warren described the match as one of the very best he had seen in 40 years of commentating and there is no doubt that the ‘hands off’ approach of the referees in the dying seconds contributed to a much more exciting finish. Even though almost everyone would agree with these sentiments, similarly very few people would like a game where high tackles went unpenalised for 80 minutes and the scrums were a dog’s breakfast with the defending team attempting to pull the ball out of the half-back’s hand every time he was feeding it. Just as the sporting world is probably a better place due to subtle home team advantage, it is probably also the case that the fans enjoy a different interpretation of the rules in the dying minutes of a close game to the rest of the match.

“It would be nice to have a simple black and white world where a player is ‘fit’ or ‘unfit’ to play and the team medical staff had to just tick the correct box, but many injuries don’t fall neatly in these binary categories.”

Hopefully the book (and this article) won’t be seen as being official-bashing, as it shouldn’t be sacrilegious to suggest that interpretations can vary with the circumstances. In a similar vein, although some righteous elements of the medical profession would argue otherwise, very similar logic applies to many of the medical decisions that get made in professional sport. It would be nice to have a simple black and white world where a player is ‘fit’ or ‘unfit’ to play and the team medical staff had to just tick the correct box, but many injuries don’t fall neatly in these binary categories. It would be equally nice



if it was clear cut as to who was actually ticking the box about whether a player was fit (i.e. is the final say up to the team doctor, coach or player himself?). Just as there are borderline umpiring decisions, there are borderline fitness to play decisions and what might rule a player out early in the season might not rule him out for a Grand Final. It goes without saying that the same injury that rules out a bench player may not be enough to rule out a superstar. For a doctor to pretend that the coach is not involved in these decisions (and vice versa) is unrealistic.

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“The fact that he remained on the field, whether fit or not fit, and kicked the winning field goal, demonstrates how much subjectivity has to be present in the medical world of professional sport. Just like there is in refereeing and coaching.”

In the recent 2011 NRL finals, there was a very public debate about whether Darren Lockyer, the now retired Broncos legend, would be allowed to play for the Broncos in a Preliminary Final, six days after suffering a severe cheekbone fracture which required surgery. Multiple doctors who weren't involved in the management of the case made public comments to the effect that he shouldn't be cleared to play because he risked eye damage if he received another blow to the same cheekbone and the fracture hadn't sufficiently healed. Certainly it would be hard to argue that the risk of eye damage – present at low level whenever you play a contact sport – wasn't increased by this injury. It would be very difficult though for anyone, even armed with all of the information about the exact location and type of fracture and surgical fixation to quantify what the increased risk actually was, let alone also judge what the threshold of an acceptable risk was. Would it be reckless for a doctor to allow a player to take the field for a Preliminary Final if the odds of permanent eye damage from that game were 1 in 1,000? Although it is overstating the rewards, there was allegedly a famous questionnaire given to athletes in the 1980s asking whether they would take a drug that would guarantee them an Olympic Gold medal but kill them by the age of 40 (...and many athletes allegedly said they would take the drug). Because of the subjectivity involved (and of course the profile of the player), the media had a field day with this case. In the end, Lockyer didn't play. Those in the Broncos inner sanctum would be the only ones to know the full story, but if you take the player at his word from his public comments, he ruled himself out (rather than the doctor doing it) but was fully preparing to rule himself in if the Broncos had made the Grand Final nine days later. Again the fracture would probably have not been properly healed just two weeks after surgery and the debate would have continued. There is no doubt that the medical staff bears some responsibility in such a situation but so does the player (and perhaps more so). It is obvious to anyone who has heard Darren Lockyer speak that he has voluntarily assumed the risk of voice damage from playing professional rugby league and even though he has actually suffered voice damage (presumably due to laryngeal trauma from rugby league)

it hasn't stopped him from continuing to play and risk further trauma and damage. Whatever risk there would have been to his eyesight from playing a week after a cheekbone fracture, he was voluntarily taking this risk 60 seconds after suffering the fracture by not leaving the field (when he played the last 10 or so minutes of the game). Perhaps it was only because he hadn't undergone a medical examination and no one knew the extent of the fracture or the extent of the risks involved. But even if doctors had have been able to freeze the match and taken him off for a CT scan to find out how depressed the fracture was and how perilously close to his eye socket it was, would they have been making the right call by insisting he had to be taken from the field for his own safety? Or should the doctors have done what they actually did do on the night, and like the referees keep their whistle in their pocket for the closing minutes of a classic match, allowing Lockyer to kick the winning field goal. You would have thought that a significantly depressed fractured cheekbone would fall into the category of 'objectively unfit to play' if it was ever possible to categorise injuries as such. The fact that he remained on the field, whether fit or not fit, and kicked the winning field goal, demonstrates how much subjectivity has to be present in the medical world of professional sport. Just like there is in refereeing and coaching.

Dr J

The opinions expressed in Dr J are the personal opinions of the author.

Exercise performance in the heat – can the brain be manipulated?



ACSMS 2011 Keynote Speaker Romain Meeusen and Bart Roelands look at brain neurotransmission and performance in high environmental temperature.

In exercise physiology fatigue has traditionally been defined as an acute impairment of exercise performance which leads to an inability to produce maximal force output (St Clair Gibson et al, 2003). During exercise in hot conditions a high body temperature may either directly or indirectly become a dominating factor (Nybo, 2010). Mechanisms by which humans lose heat are well described and include dilatation of the skin vessels, causing the warm blood from the body core to flow to the skin with sweating to facilitate evaporative heat loss. During exercise we are no longer able to redistribute the same amount of blood from the body core to the skin, as the working muscles also demand increased amounts of blood (Nagashima, 2006). The logical outcome is a rise in core temperature, inducing hyperthermia. Consequences are increases in the physiological strain on the body, and a severely impaired exercise capacity. Decreases in performance are specifically reported when exercise is undertaken in high ambient temperatures (Parkin et al, 1999).

“...there has been an increased interest in the role of hyperthermia and the link with pharmacological agents acting on the central nervous system during prolonged exercise.”

Mechanisms that cause this detrimental effect on performance during exercise in the heat were assumed to be associated with muscular and peripheral factors; however, these are not altered in such an extent that it would explain the diminished endurance during prolonged exercise in the heat (Nybo & Secher, 2004). Muscle glycogen stores are far from depleted, muscle and blood lactate concentrations are not elevated to levels normally associated with fatigue, and potassium release does not explain the hyperthermia-induced fatigue either (for review see Roelands & Meeusen, 2010). This lack of peripheral effects suggests important roles for thermal regulation and central neurotransmission. Interesting studies by Nielsen and co-workers revealed that exercise performance in the heat is primarily regulated by a reduced central nervous system drive (Nielsen et al, 1993; 1997).

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“...there has been relatively little work on dopamine and noradrenaline manipulation on exercise capacity in humans.”

Thus, fatigue will not only occur at the peripheral level, there is ample evidence that mechanisms within the central nervous system (CNS) are also implicated in the genesis of fatigue. This notion is not new; Alessandro Mosso (1904) already demonstrated a reduced exercise capacity following a mental effort. In the later stages of last century brain neurotransmission received increasing attention with regards to its relation with the development of fatigue. Romanowski and Grabiec (1974) related serotonin (5-HT), while Heyes (1985) linked dopamine (DA) to a possible centrally mediated fatigue. Initiated by Acworth et al (1986), Newsholme and his coworkers (1987) developed the first hypothesis implicating changes in central neurotransmission to explain fatigue i.e. the ‘*Central Fatigue Hypothesis*’ (for review see Meeusen et al 2006).

“Mechanisms that cause this detrimental effect on performance during exercise in the heat were assumed to be associated with muscular and peripheral factors...”

This initiated a new line of research in which both pharmacological and nutritional manipulations were applied. Studies were aimed at influencing one or more brain neurotransmitters (predominantly 5-HT, DA and noradrenaline (NA)), to delay or accelerate the onset of fatigue during prolonged exercise (one to three hours). Most studies were performed in normal ambient temperature (for review Meeusen et al, 2006), but, since 5-HT, DA and NA have all been implicated in the control of thermoregulation and are thought to mediate thermoregulatory responses (Bridge et al, 2003), it can be expected that a shift in the concentrations of these neurotransmitters contributes to changes in thermal regulation and fatigue resistance.

Brain neurotransmission and performance in normal environmental temperature

A vast amount of human and animal studies has looked into the effects of pharmacological manipulation of one or more brain neurotransmitter systems on performance and physiological parameters. In a series of animal studies Bailey and colleagues (1992; 1993) showed a dose-dependent decrease in exercise capacity after administration of a specific 5-HT receptor agonist and antagonist. Thus far, results from human studies have not been that conclusive with some studies that showed a decrease in performance after 5-HT reuptake inhibition (Wilson & Maughan, 1992; Struder et al, 1998) while others were unable to detect any change in exercise capacity due to alterations in brain 5-HT content (Meeusen et al, 2001; Roelands et al, 2009a; Pannier et al, 1995). Amphetamines and other DA agonists have shown clear performance improvements in rat studies (Gerald, 1978; Heyes et al, 1985). Despite the apparent link between exercise and catecholaminergic neurotransmission demonstrated in animals, there has been relatively little work on dopamine and noradrenaline manipulation on exercise capacity in humans. Recently, two studies in our lab were not able to show any performance improvements. Both a DA/NA reuptake inhibitor (bupropion; Watson et al, 2005) and a DA reuptake inhibitor (methylphenidate; Roelands et al, 2008a) did not have an ergogenic effect but did increase core temperature compared to the placebo situation. NA reuptake inhibition has shown to decrease performance in humans on different occasions (Piacentini et al, 2002; Roelands et al, 2008b).

“...this drug may dampen or override inhibitory signals arising from the CNS to cease exercise due to hyperthermia...”

This is somewhat surprising as NA is implicated in the level of arousal, consciousness and reward mechanisms in the brain (Roelands & Meeusen, 2010). Most evidence suggests that 5-HT and DA may be involved in central fatigue, but might not individually be able to alter fatigue. The NA neurotransmitter system has a negative influence on performance when its effects are augmented in normal ambient temperatures. As it seems difficult to postpone fatigue in normothermia, in recent years there has been an increased interest in the role of hyperthermia and the link with pharmacological agents acting on the central nervous system during prolonged exercise.

Brain neurotransmission and performance in high environmental temperature

Work conducted by Strachan et al (2004) recently investigated the effect of acute paroxetine (a SSRI) administration. While the drug induced a slight increase in core body temperature at rest and during exercise, time to exhaustion, perceived exertion and the hormonal response to exercise were not different between trials. Bridge et al (2003) provided limited evidence that a high dopaminergic activity is associated with an increased tolerance to exercise in the heat. A recent series of studies in our lab employing preloaded time trials (1h cycling at 55%W_{max} followed by a 30min TT) was able to detect significant changes in performance after different pharmacological manipulations in 30°C. In a first study a DA/NA reuptake inhibitor (bupropion) improved performance by 9 per cent or over three minutes (Watson et al, 2005). At the same time core temperature rose significantly higher compared to the placebo situation (to an average 40.0°C). Interestingly, these effects took place without any change in the subjects' perception of effort or heat sensation. It is possible that this drug may dampen or override inhibitory signals arising from the CNS to cease exercise due to hyperthermia, and enable an individual to continue to maintain a high power output (Watson et al, 2005). This study was repeated in rats. Results from the human study were confirmed, there was a significant performance improvement and showed that bupropion increased both core and brain temperature (Hasegawa et al, 2008). In the search for an underlying mechanism for these results we looked at the individual effects of manipulation of the dopaminergic and noradrenergic neurotransmitter system (Roelands et al, 2008a,b).



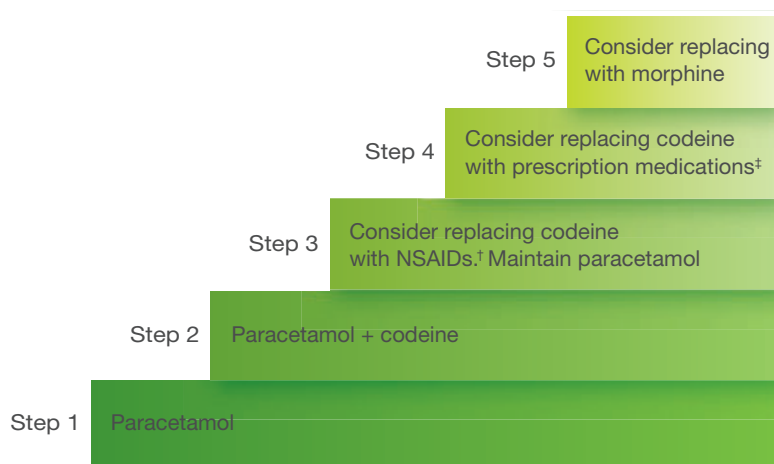


ANALGESIA IN MUSCULOSKELETAL SPRAINS AND STRAINS: DON'T UNDERESTIMATE THE VALUE OF PARACETAMOL

Australian guidelines recommend paracetamol first-line for acute musculoskeletal pain, due to its efficacy and side-effect profile^{1,2}

If adequate pain relief is not achieved, a step-up approach to analgesia is recommended.^{3,4}

World Health Organisation (WHO) analgesic ladder³



[†] With consideration of additional risk factors, e.g. asthma, hypertension, renal disease, heart failure, diabetes, stroke. [‡] Including tramadol.

Adapted from Boger et al. 2005³

Australian Therapeutic Guidelines advise weighing up the potential benefit of NSAIDs against their potential harm, particularly in high-risk patients.¹ NSAIDs

should only be used for short periods of time (such as up to 3 weeks) and paracetamol may be used to reduce overall daily doses of NSAIDs as required.¹

Key implications for physiotherapists and sports physicians:

- Do not automatically recommend an NSAID for a sprain or strain due to its anti-inflammatory action
- Based on the evidence currently available, paracetamol should be the first-choice analgesic for the management of acute musculoskeletal injuries¹⁻⁴
- Reserve NSAIDs for patients with excessive swelling^{4,5} or uncontrolled inflammation⁴

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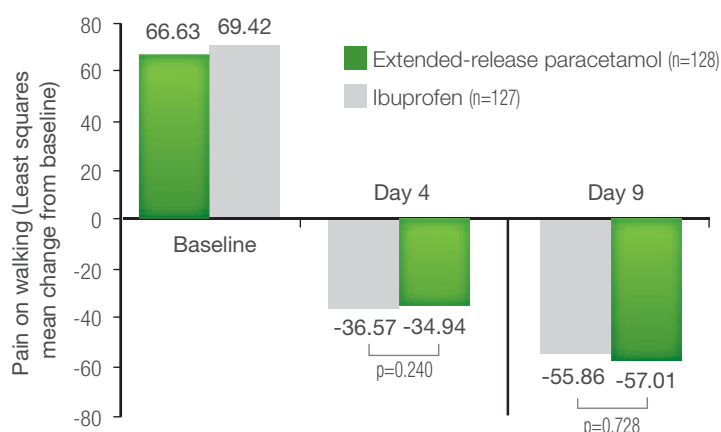


Efficacy of over-the-counter NSAIDs vs. paracetamol in acute musculoskeletal pain

Evidence suggests that paracetamol is equally as effective as an NSAID in the relief of acute musculoskeletal pain,⁶⁻¹⁴ such as low-back pain.¹⁰⁻¹³

In study of patients with ankle sprain, efficacy with extended-release paracetamol was comparable to ibuprofen, and allowed patients to resume normal activities as early as 4 days after their injury.⁶

Extended-release paracetamol* vs. ibuprofen in relieving pain on walking after ankle sprain (ITT population)⁶



*The extended-release paracetamol product used in this study is a US-based formulation which contains 650 mg paracetamol versus the 665 mg in the Australian Panadol® Back and Neck Long Lasting formulation. Both formulations use bi-layer technology that provides an immediate-release layer of paracetamol followed by a slower, time-released layer of paracetamol, to provide up to 8 hours of pain relief.¹⁵

Adapted from Dalton et al. 2006⁶

Panadol Back & Neck Long Lasting for acute musculoskeletal pain¹⁵

Panadol Back and Neck Long Lasting is a modified-release, bi-layer formulation that contains 665 mg of paracetamol to provide up to 8 hours of pain relief.¹⁵ The efficacy of paracetamol depends on adequate and regular dosing.

The maximum daily dose of Panadol Back and Neck Long Lasting is 2 tablets three times a day, which provides 3.99 g of paracetamol/day.¹⁵



“It is very unlikely that one neurotransmitter system is responsible for the appearance of central fatigue.”

Methylphenidate (Ritalin®) blocks the reuptake of DA in the presynaptic cells and had strong ergogenic (16% improvement) and thermogenic (average core temperature of 40.0°C) effects compared to placebo. As in the acute bupropion study, subjects did not feel they were pushing much harder and getting much warmer (Roelands et al, 2008a). The opposite is true for Reboxetine, the NA reuptake inhibitor that decreased performance by 20% (Roelands et al, 2008b). In the above mentioned studies the ‘drugs’ have been administered acutely. Interestingly, it seems that chronic administration of bupropion for consecutive days will result in a different response to the drug compared to acute intake and eliminate the performance effect (Roelands et al, 2009b). This discrepancy can be explained by changes in neurotransmitter homeostasis. Peak plasma concentrations of bupropion are reached after 2.5–3 h, while the peak plasma concentration of hydroxybupropion (major metabolite of bupropion; acts as a NA reuptake inhibitor) is reached after about six hours following acute administration of a single dose of bupropion. This means that bupropion exerts its first effects via predominantly DA pathways, while the metabolite hydroxybupropion increases the importance of the NA pathways, only from 6 hours post-administration (European Agency for the Evaluation of Medicinal Products, 2002). Recently Jefferson et al (2005) stated that 7–10 days are required for bupropion and its metabolites to reach steady state levels (in our study subjects took bupropion for 10 days). After chronic bupropion administration, peak plasma concentrations of bupropion remains similar to values reported after a single dose, while for hydroxybupropion there is a fourfold increase at steady state in comparison to acute dosing, meaning that after 10 days the peak plasma concentrations of hydroxybupropion become much greater than the peak plasma concentrations of bupropion (Committee for Proprietary Medicinal Products, 2002). This theory feeds the assumption that bupropion is primarily under NA influence after chronic administration (Roelands et al, 2009b). Another plausible explanation for the observed difference between acute and chronic administration of bupropion may relate to an up regulation of the DA transporter in the caudate putamen and nucleus accumbens.

Conclusion

Pharmacological manipulations during prolonged exercise in both normal and high ambient temperature will result in different effects depending on the environmental temperature and on the neurotransmitter systems that have been manipulated. In the heat, DA has shown clear ergogenic effects and seems to override inhibitory signals from the central nervous system to stop exercising when core temperature becomes high. NA reuptake inhibition induced negative effects on performance during prolonged exercise and lower core temperatures during and at the end of exercise compared to the placebo situation in both normal and high ambient temperature. It is very unlikely that one neurotransmitter system is responsible for the appearance of central fatigue. Most probably central fatigue is caused by a complex interplay between the different neurotransmitters systems, with the most important role for the catecholamines DA and NA. Although work to date has given us clear observations on external behavioral changes after pharmacological interventions, the exact role of the different brain areas linked to exercise capacity and thermoregulation have yet to be elucidated.

Romain Meeusen

Bart Roelands

References, as indicated within the article, are available at sma.org.au/publications/sport-health/



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Reaching beyond our research comfort zones



Dr Cristina Caperchione from the University of British Columbia explores the area of transdisciplinary research and the concept of 7 'Trans' Domains as discussed at the recent ISBNPA conference.

Over two decades scientists have witnessed a burgeoning interest and investment in transdisciplinary research. This has been particularly appealing to behavioural health scientists, as we diligently work to enhance the impact and reach of our research given the global and multidimensional health issues that challenge us.

Transdisciplinarity is rooted in the rise of the so-called knowledge society, referring to the growing importance of scientific knowledge in all society fields.¹ With reference to research in particular; it includes transgressing boundaries between scientific disciplines and between science and other societal fields. Transdisciplinary research has arisen from a growing number of real-world, complex issues and challenges for which knowledge-based solutions are sought, but knowledge from one particular discipline or societal field alone is not sufficient.¹

At a recent scientific meeting hosted by the International Society of Behavioural Nutrition and Physical Activity, in Melbourne, Australia (June 2011), Professor Abbey King eloquently highlighted the significance of the 'trans'-disciplinary research paradigm, stating that "it is time for researchers to think beyond our own square and push beyond our usual comfort zones".

It is time to understand the true nature of 'trans' and bridge, connect, span and reach across our own behavioural health discipline in order to expand our research impact and reach. It was suggested that maybe the value of transdisciplinary research is not actually isolated to the 'disciplinary' nature of the paradigm, but rather encompasses the many domains associated with the 'trans' prefix. During Professor King's address, she provided the delegation with 7 'Trans' Domains², which I believe could certainly be a formula to consider as we move forward in trying to address some of the global, multidimensional health issues we continue to face.



“Transdisciplinary research has arisen from a growing number of real-world, complex issues and challenges for which knowledge-based solutions are sought, but knowledge from one particular discipline or societal field alone is not sufficient.¹”

Domain #1

Revisits **‘trans’ disciplinary**, highlighting the need to consider the growing disciplines/areas that are of relevance to our field. As behavioural scientists we need to move past traditional collaborations and consider research teams which include disciplines such as genetics, nutrition/dietetics, health economics, neuroscience (brain health), medical anthropology, engineering and geography. Each of these disciplines will make a significant contribution to our research teams. For instance, we are well aware that genes play a moderating role in behaviour change, thus expertise in genetics would help inform the intervention.

Domain #2

Emphasised the need for **‘trans’ generational** thinking, break away from specific age categories and broaden your thinking across the life span. Use your life course thinking by understanding the health behaviours of children, youth, young adults and older adults, rather than one particular age population. Consider areas of research which might be similar across age categories. For instance, active transport may be similar for children, as they are not old enough to drive, and seniors as many no longer drive. Addressing this change over time (as an individual ages) will provide research over the life course.

Domain #3

Engage in **‘trans’ lational** thinking in order to disseminate evidence based research efficiently and thus effectively translating this research into community health practice and policy. Keep in mind that part of ‘trans’ lational thinking involves community-based participatory research, in which we engage the community in the research-translation process.



Domain #4

Consider the ***'trans' modal*** opportunities available for dissemination and translation. Harness the wide range of communication pathways and technologies that are now available for delivering health interventions as well as disseminating of our research findings. Furthermore, this is a way to shrink the health disparities gap, as it provides the opportunity to deliver health information in different languages and at literacy levels appropriate for different groups.

“We can no longer limit ourselves to our own research ‘comfort zones’, but rather we must break free of these isolated zones and embrace the *'trans' ient* nature of everything.”

Domain #5

Use ***'trans' problem*** orientation when developing interventions. Encompassing more than one health behaviour in an intervention will be cost and time effective as well as uncover potential synergistic issues. For instance, consider pairing physical activity and nutrition interventions to optimise behaviour change.

Domain #6

Strive for ***'trans' formative*** thinking, you want to impact public policy by developing individual level interventions through to policy level interventions. Identify potential policy implications, connect with local lawmakers/ decision makers, identify allies amongst policy makers, and learn the logistics for how to turn research results into policy.

8/10

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Domain #7

Lastly explore *'trans' national* research collaborations. Given the globalisation of our many health concerns, it only seems logical to engage in international collaborations in order to better understand the many different factors which influence our health behaviours. Furthermore, as our global demographic continues to become multicultural, it is important that researchers understand the cultural traditions and practices of our multicultural communities in order to develop best practice approaches. Undertaking international collaborations will provide a greater understanding and knowledge exchange concerning these traditions and practices.

As outlined by these 7 'Trans' Domains, relying on the 'Trans'-disciplinary domain alone is only part of the research paradigm puzzle. Clearly, Professor King has uncovered a number of cornerstones (transdisciplinary being just one of them) which must be considered in order to have the greatest research impact and reach.

We can no longer limit ourselves to our own research 'comfort zones', but rather we must break free of these isolated zones and embrace the *'trans' ient* nature of everything. Engaging in the process of 'trans', as outlined by the 7 Domains, will allow each of us to connect, bridge, and span many different knowledge bases, resulting in efficient and effective research practices.

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The keys to business success

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The potential for bad feedback

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Social marketing on Facebook and Twitter gives business the opportunity to, for next to no cost, connect with, sell to and inform clients.

The other major plus is that because of the nature of social networking, while doing all those things you create a feeling of community among your clients.

This can only be a positive when it comes to client retention.

But there is another side to the coin.

The two things stopping most business from embracing this are;

ONE: they do not understand it and are therefore apprehensive about jumping in feet first.

TWO: they are scared about, and don't know how they deal with negative comments.

The ability of a client to comment directly on their service makes many people nervous, which is understandable.

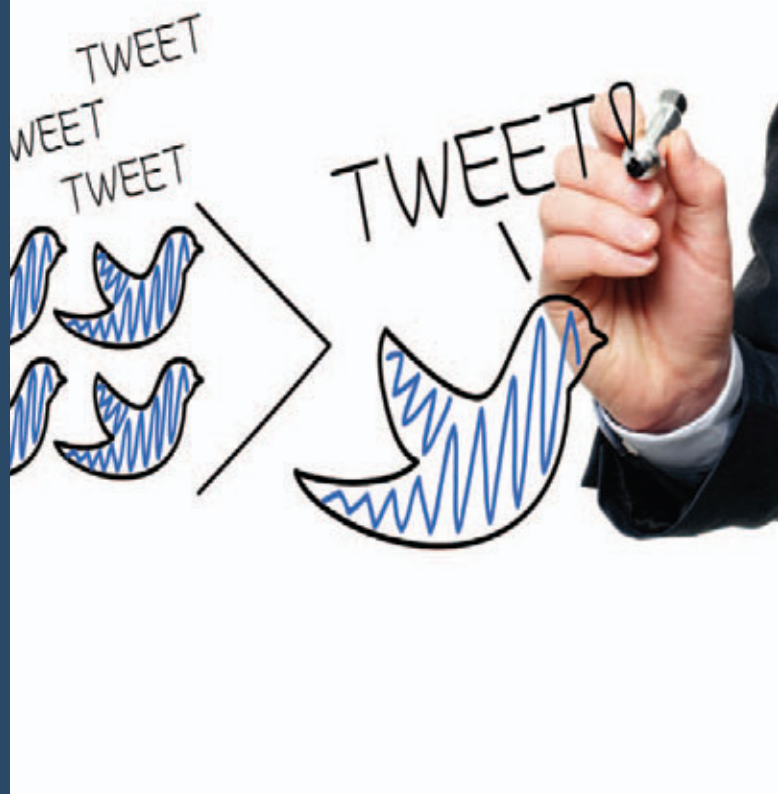
And while everyone strives to give great customer service all the time, sometimes for whatever reason, a client can become disgruntled.

A Facebook or Twitter page allows them to voice their displeasure without you first being able to talk them down off the ledge.

They are able to air their grievances, and the whole world sees what they have to say.

So what do you do?

What often happens in this situation is if this is an isolated incident, your other, happier followers will immediately jump to your defence. This result is the best case scenario.



Conversely you can always pull the comment down, or do, what I suggest. If possible address it online, calmly and logically.

Don't be afraid of instant feedback, it also allows you to deal with things as quickly.

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The neuroscience of marketing

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There's a famous quote in marketing circles: 'I know half my advertising is wasted. I just don't know which half.'

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Say Pepsi starts a new TV campaign. A month later, sales of Pepsi go up. It's gotta be the advertising, right?

Well, as those of you with a scientific bent will already be saying, not necessarily. It could be due to a dozen other things. Let's say Pepsi change their label at the same time. What's making the difference? The ad? The label? Both? Neither?

An exact science

So how do you tell if a marketing strategy is going to work – ahead of time?

Enter neuromarketing.

Neuromarketing sounds scary, but it's really just a collection of marketing tricks and techniques with a bit of science behind them.

For example, you might not know the term 'social proof', but you've probably experienced it plenty of times. Remember the last time you went out to dinner without booking ahead? You strolled along the street, looking in windows, avoiding those restaurants with hardly any customers.

That's because we use other people's opinions to form our own. If there's a queue around the block, we want in. If the place is empty, we wonder what really goes into the chef's special. It's one of the reasons Amazon has a big section of its homepage devoted to 'What other customers are looking at right now'.

Then there's a phenomenon called price anchoring, which explains why everything was cheaper back in our day.

Basically, we're very bad at working out the value of something we've never seen before. So we gravitate to whatever information we can get. Including the first price we see.

Steve Jobs of Apple used this cleverly when the iPad came out. He kept saying, 'You'd expect to pay a thousand dollars for something like this.'

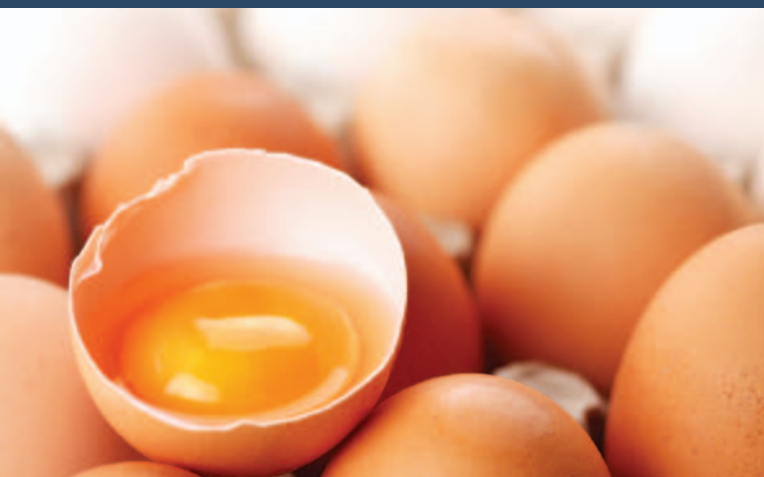
That price anchored – so when it came out for a measly \$499, everybody thought they were getting a bargain.

(Retailers have been using this phenomenon for years without realising it. Basically, every time you see a discount of the recommended retail price, that's price anchoring at work).

And neuromarketing can get extremely precise. For example, the world's largest egg producer – in Saudi Arabia – used an MRI machine to see how our brains reacted to different shades of yellow. The one we liked best was injected into chickens, to change the colour of their yolk.

As the science gets better and more sophisticated, you'll be seeing much more of this sort of thing from big brands around the world.

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Succession planning – Passing the baton

Brought to you by Peter Rankin – Davidsons



What is succession planning?

Succession refers to the transfer of the ownership and/or management of a business. Ownership succession focuses on who will own the business, when and how that will happen. Management succession focuses on who will run the business, what changes will occur and when the new manager will be accountable for results.

Does your succession plan address the following?

- How the way you do business is changing and the events you need to control
- How the best time to start planning for your succession is when you buy or start your business
- How realising your optimum business value will become more difficult with many businesses for sale and less qualified, willing buyers
- How to realise future business value by ensuring a future buyer

If your business is your major source of income and wealth, you must do all that you can to protect its current and future value. Make sure you are in a position to control your succession. Succession planning tends not to become a priority until it is too late. Don't wait for something to happen – for example, ill health, a partnership dispute, relationship breakdown, major clients or staff leaving the firm.

Preparing a business succession plan requires you to write down your strategies, goals and objectives so they are not just thoughts.

Did you realise that there are 20 fundamental components that need to be considered when planning your succession? Three major factors you will need to consider are:

1. Control

Your attitude to control strongly influences the outcomes of your business succession plan. For example, if you are not prepared to consider a change in ownership, selling will be your primary exit option. Effective Succession Planning also allows you to identify strategic events that you can and can't control. Prevention is better than cure. Make sure your business succession plan includes ways to control or manage owner and other strategic events.

2. Financial life planning

A financial life plan determines what your business is worth today and what it needs to be worth at retirement. It is particularly important when you are relying on the sale of your business to fund your retirement. Effective Succession Planning allows you to be in a position to make an informed choice about your exit, not having that choice imposed on you.

3. Exit options

When determining your exit strategy it is important to consider your life balance goals as your life balance position will influence your choice of exit option. Ensure that you are aware of all alternatives. Succession does not just mean selling your business.

The best thing to do NOW is start planning your succession.

For more on Effective Succession Planning contact Peter Rankin at Davidsons, peterr@davidsons.com.au

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Interviewing

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You have reviewed the applicants for the position and have identified four candidates who you have invited in for an interview; this is not something you do regularly so what should be your approach?

Remember that the purpose of the interview is for you to find out more about the candidate; hence you should be speaking 20% of the time and allowing the candidate to speak the other 80%. You have two ears and one mouth so that should tell you something!

To make the candidate feel at ease open the interview by giving the person an outline of your organisation, its future and the role. If it is relevant, ask the candidate what he/she knows about your organisation and the industry, this will give you an indication of what, if any, research they have done prior to the interview.

With the candidates' CVs focus on the past 5–10 years as this is most relevant; they will have made mistakes in their early employment and hopefully will have learnt from these. What they did prior to this may not be all that relevant in a technology based industry. Check for gaps between jobs; were they taking a sabbatical, consulting or just out looking for work? Ask why they left their previous roles.

Having prepared a list of the key competencies required, frame your questions around these. Be careful when asking typical behavioural type questions, such as tell me about your best/worst employment experience. A well prepared candidate will already have answers to these. Your interview should be like peeling an onion, layer by layer to get the answers you are looking for. Remember lack of cultural fit is more likely to be the reason an employee leaves your business than lack of technical competencies.

First impressions do count and often your gut is a good indicator. However be careful of your inbuilt biases as we are subconsciously attracted to people who think like us.



Ask the person what they do outside work as this will give you an indication of work/life balance; are they involved in the local community, are they a member of a professional or sports association?

Ask the candidate to give four or five adjectives to describe themselves; this is a good guide to how they may satisfy the behavioural competencies you require. For example if it's a sales role, typical responses could be energetic, integrity and results focused. Ask their most recent remuneration as this will give you an idea of their level of responsibility and seniority in their previous position.

Check their availability and any restraint of trade clause with their previous employer. Finally if appropriate ask the candidates to provide you with one to two pages of how they believe they would add value to the role and meet the key competencies you require.

If you wish to employ psychometric testing remember it has value but the results are not absolute, good for numerical and reasoning competencies. It is also important to ensure the testing is relevant to the role!

Finally ask the candidate if they have any questions; if they are serious about the role they should have.

BGH International operates successfully both in domestic and international markets and across diverse cultures, specialising in sourcing and placing high calibre senior executives for clients in Australia, Asia, Middle East and Africa. For more information visit www.bghinternational.com.au

Interview with Jeff Hendra

Lead Physical Therapist, PGA Tour



Inside the PGA Tour Rehab Trailer.

Jeff Hendra takes us into his world of overseeing the health of professional golfers and gives us an insight into the recent Presidents Cup tournament held in Melbourne (November 14–20, 2011).

What is your study/career background?

Jeff Hendra, PT, MTC, SCS, CGFI.

I hold a Bachelor of Science degree in Exercise Science, a Master of Science degree in Physical Therapy, I am a Board Certified Sports Physical Therapist through the American Physical Therapy Association (SCS), a Manual Therapy Certification (MTC) from The University of St Augustine

Florida, and I am a Certified Golf Fitness Instructor (CGFI) through the Titleist Performance Institute. I have been in the Physical Therapy (PT) business for over 20 years and have been a PT for 14 of those years. Prior to starting full time with the PGA Tour in 2004, I worked in several outpatient and sports medicine settings including being the team physio for Calvin College Hockey Team.

Tell us a little about your current job.

Currently I'm the lead physical therapist with the PGA Tour which puts me on the road approximately 30 weeks every year. We travel the United States working out of semi-trailers

that expand to approximately 750 square feet. One truck is a physical therapy/chiropractic clinic for rehab staffed by two PTs and a chiropractor. It has everything a normal clinic would have including hi-low tables, Ultrasound, Electric Stimulation, hot packs, cold packs, etc. The other truck is a 'rolling gym' staffed by two of our athletic trainers and is equipped with treadmills, stationary bikes, free weights, medicine balls, etc. These two trucks travel to every Tour stop. A second set of identical trucks provides the same service on the Champions Tour. Prevention and maintenance, stretching, soft tissue mobilisation, joint manipulation and exercise instruction is a big part of what we do. During a full field event of 156 players we'll see anywhere from 40–60 players daily.

How did you get involved in working with golfers?

I became involved with the PGA Tour through my former employer who, in 2004, had just become the sponsor of the Tour's sports medicine program. I met the liaison between the Tour and the company in January of that year and expressed an interest in working on the road. They called me five months later and I've been on the road ever since!

You travel a lot. What Tours do you attend on a yearly basis? Do they differ in what you need to provide?

I work The Masters every year as well as The PGA Championship, Kapalua & The Sony. I've worked each Presidents Cup and Ryder Cup since 2008. The only difference week to week is whether or not our trucks are there. When we travel abroad, or when we go to Hawaii, Mexico or Puerto Rico, our trucks cannot be present. We then work out of locker rooms or hotels with portable tables and a trainer's bag. Treatments remain consistent for the most part.

What is your role at The Presidents Cup?

My role is to keep my players as healthy as possible. I also coordinate equipment that I, our chiropractor, or our team members may need that week.

Who else (medical wise) do you work with in your role? Tell us a little about these working relationships in terms of handling the golfers.

We have a team approach to treatment on Tour as our trucks are staffed with PTs, Chiropractors and Athletic Trainers. Some players prefer having a PT treat them, while others prefer chiropractic care. Luckily, we have a

very skilled and knowledgeable staff and care between individual staff members is very seamless. Very often our staff will perform an evaluation and begin hands-on treatment. After this it may be common to refer them to our training staff for a workout routine to maintain gains we've accomplished. I also coordinate and work with on-call doctors to set up appointments for any golfer requiring an outside referral. An outside referral may be necessary for anything from a bone fracture to a toothache to an insect bite.

What sort of medical/fitness issues do golfers have?

Low back pain is the most common complaint. Causes of this include muscle imbalance/weakness, joint pain, or disk involvement. Other common complaints are left hip pain and decreased mobility; neck/shoulder pain; shoulder, elbow and wrist tendinitis; and left ankle pain to name a few. From a fitness side, we often see hip weakness and inflexibility, low back and hamstring inflexibility, and hip flexor inflexibility/weakness.

How do these injuries usually occur?

These injuries occur from the repetitive and one-sided nature of the golf swing. Golf may be one of the only sports where the players practise before AND after they play. With that much use of the same muscles and joints in the same planes of motion, certain body parts are often fatigued and can become inflamed without adequate rest. One of the toughest obstacles we face as the medical staff is limiting the amount of activity of players with injuries and ensuring they get proper rest.

What does a typical day at The Presidents Cup consist of?

A typical day is spent entirely with the team. We have breakfast with them, we go to the course with them, we treat them, will often follow them on the golf course and treat them again after the round. It's always a full day at The Presidents Cup with very little down time!

Tell us your most interesting encounter while working at The Presidents Cup?

Most interesting encounter was two years ago in San Francisco. I was assigned to work with Greg Norman and his international team. But on Sunday, a high profile player from the US team approached me and asked if I could treat him. Having President Clinton walk up to me and introduce himself was also quite a surprise.





Enjoying the views of the 18th fairway.

What are the highlights and challenges with working with elite sportspersons?

Highlights of working with elite golfers is that you get to know the person behind the 'persona'. Sometimes they're nothing like the way the public views them. Other highlights include a bit of your own minor celebrity status. This happened to me a few months ago when I was called out to treat a player on the course and ended up on national TV for five minutes. The biggest highlight for me though is travelling to all the different cities we're fortunate enough to go to and to see what each place offers. Not to mention all the beautiful golf courses and clubhouses we get to call home for a week at a time.

Challenges include the occasional (thankfully only VERY occasional!) elitist or entitled mentality that a very few have. Also, because there is no 'team' in golf, consistency and continuation of care to some of them can sometimes be difficult at best. I treat them one week and then they're off for two weeks. When they come back, I may be off that week. That is occasionally a challenge as it's 156 golfers and 3 PTs all with different schedules.

Who have you been inspired by on Tour?

I've been inspired by the guys who have managed to balance their personal life and be a successful touring pro at the same time. Golfer by day, superhero dad/husband by night! I feel the same way about my colleagues on Tour who have been travelling longer than I have. I'm also very inspired by the guys who have attained great fame and fortune and have remained humble, polite and courteous to everyone they come in contact with.

What advice would you give other sports medicine professionals looking to get into working with elite sportspersons?

For young sports medicine professionals looking to work with elite athletes at the professional level, I offer this advice: get to know the right people and remain available and open-minded! There are a million medical professionals with outstanding experience and qualifications. That's very important. But if you don't make yourself available and get to know people, nobody will know about you. Start making those contacts.

With Ryder Cup Captain Corey Pavin at last year's Ryder Cup in Wales, UK.

ACSMS 2011 recap

Vox pop

At the recent ACSMS 2011 Conference SMA asked conference delegates their opinions on the following question:

How would you suggest to prevent inactivity within a community?



"By communicating with and providing positive physical activity opportunities for our children. Perhaps we can shift the parent's physical activity perceptions through the kids!"

*Tanya Cates,
Associate Lecturer, VIC*



"Provide easily accessible and cost effective exercise programs which would include walking groups, team sports, group classes and individual support. Make it fun and aimed at all fitness levels and ages."

*Kerry Peek,
Physiotherapist, SA*



***Sport Health* gives you all the highlights from this year's Australian Conference of Science and Medicine in Sport.**

Overview

This year's 2011 Australian Conference of Science and Medicine in Sport in the historic town of Fremantle was a huge success. Over 450 delegates enjoyed the mix of sports medicine clinical and research content, blended with a larger than usual physical activity stream led by enthusiastic keynote, Associate Professor Mark Fenton from Boston, USA. He joined a long list of insightful keynote presenters including Dr Richard Bouché, Professor Romain Meeusen, Professor Erik Witvrouw, Professor Martin Hagger and the 2011 Refshauge Lecturer Professor Ken Fitch, one of SMA's founding members.

This year we were blessed with a plethora of high calibre presentations and presenters, although it did make it hard when it came to awards time! Congratulations to Catherine Wild from the University of Wollongong who took out the major prize of the Asics Medal for the Best Paper Overall for her research into ACL injuries.

The social calendar was also a much talked about highlight, with delegates enjoying catching up with old friends while making new ones over dinner and drinks throughout the week.

Sports Medicine Australia would like to thank all conference partners and trade exhibitors for their involvement in ACSMS 2011. Most notably we are grateful for our long time partner Asics, and our most recent conference partner DJO Global. SMA also owes thanks to the Conference Chair, Kay Copeland and the Conference Committee of Professor Andy Cresswell, Professor Garry Allison, Associate Professor Shane Brun, Associate Professor David Dunstan, Mr Chris Bishop, Mr Allan Boys, Associate Professor Trevor Shilton and Dr Anita Green.

All Conference abstracts will be published online as a supplement to the December 2011 edition of the *Journal of Science and Medicine in Sport*. More details about this Journal, including subscription information can be found at www.jsams.org.

We hope all those who attended ACSMS 2011 were stimulated by the program and took pleasure in the typically social event, and we look forward to seeing you in Sydney for be active 2012 next year.

New technology

This year saw ACSMS 2011 trial new technology with the conference program available via a smart phone app. Program abstracts were also accessible in either hard copy or USB catering to both the traditional and more tech savvy audience. The conference also saw a record number of tweets via #acsms and the number of conference Twitter followers rapidly increase.

Awards

Congratulations to the following 2011 Australian Sports Medicine Federation Fellows Award winners:

Asics Medal – Best Paper Overall (\$6,000 prize including Best New Investigator award)



Catherine Wild

University of Wollongong

"Does higher anterior knee joint laxity alter landing biomechanics in pubescent girls? Implications for non-contact ACL ruptures"

Co-Authors: J. Steele & B. Munro

Best Paper Awards

Asics Best Paper – Clinical Sports Medicine (\$2,000)



Ivan Hooper

Australian Institute of Sport and National Rowing Centre of Excellence

"The development of a clinical management pathway for chest wall pain in elite rowers"

Co-Authors: P. Blanch & J. Sternfeldt

Asics Best Paper – Exercise and Sports Science (\$2,000)



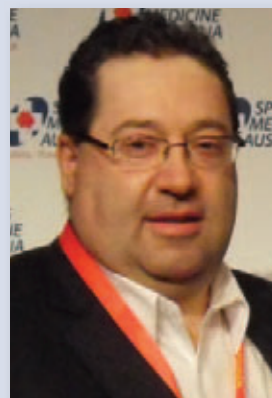
Angela Spence

University of Western Australia

"Does exercise training influence cardiac morphology? A prospective, longitudinal MRI study"

Co-Authors: H. Carter, L. Naylor, L. Dembo, K. George & D. Green

Vox pop continued



"Improving public transport – accessibility, cost and frequency would serve a number of purposes, reduction in car use which in turn would improve environmental quality, enhance cycling safety and encourage incidental walking as one gets to and from the public transport."

David Bolzonello, Sport and Exercise Physician, VIC



"Education from schools and clubs continued through the ageing process to promoted events on a regular basis – promotion through lifestyle events rather than competitive events. Family days – play today – family activities."

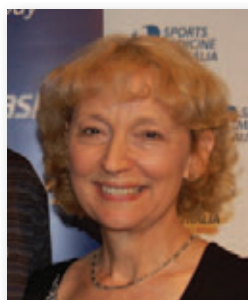
Patrick McCudden, Soft Tissue Therapist, NSW



"Improve physical environment with tree planting, provision of seating on prominent access routes to schools, shops, community centres. Introduce people within a community to the clear dangers of physical inactivity."

Michael Kenihan, Physiotherapist, VIC

Asics Best Paper – Physical Activity and Health Promotion (\$2,000)



Wendy Brown

School of Human Movement Studies, University of Queensland

“Physical activity and all-cause mortality in older women and men”

Co-Authors: D. McLaughlin, J. Leung, L. Flicker, O. Almeida, G. Hankey, D. Lopez, K. McCaul & A. Dobson

New Investigator Awards

Asics Award for Best New Investigator – Lower Limb (Presentation package at ACSM)



Catherine Wild

University of Wollongong

“Does higher anterior knee joint laxity alter landing biomechanics in pubescent girls? Implications for non-contact ACL ruptures”

Co-Authors: J. Steele & B. Munro

Ken Maguire Award for Best New Investigator – Clinical Sports Medicine (\$2,000)



Kassia Weston

University of Queensland

“Contribution of autonomic dysfunction to abnormal exercise blood pressure in patients with type 2 diabetes mellitus”

Co-Authors: J. Sacre & J. Coombes

John Sutton Award for Best New Investigator – Exercise and Sports Science (\$2,000)



Tina Skinner

University of Queensland

“Does coinciding exercise onset with peak caffeine levels improve cycling performance?”

Co-Authors: D. Taaffe, M. Leveritt, J. Coombes & D. Jenkins

NSW Sporting Injuries Committee Award for Best New Investigator – Injury Prevention (Presentation package at ACSM)



Marcus Lee

School of Sport Science, Exercise and Health, University of Western Australia

“Using a 3D integrated stereoscopic system to investigate the biomechanics of evasive sidestepping: Implications for ACL injuries”

Co-Authors: B. Lay, D. Lloyd, P. Bourke & J. Alderson

Asics Award for Best New Investigator – Physical Activity and Health Promotion (Presentation package at ACSM)



Jenny Gianoudis

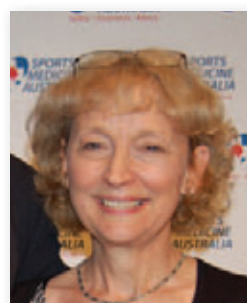
Department of Medicine, University of Melbourne

“High velocity power training with weight-bearing and balance exercises improves bone density and function in high risk older adults: A 12-month RCT”

Co-Authors: C. Bailey, P. Ebeling, C. Nowson, K. Sanders, K. Hill & R. Daly

Women in Sport Award

Wendy Ey, Women in Sport Award (\$500)



Wendy Brown

School of Human Movement Studies, University of Queensland

“Physical activity, sitting and weight gain in Australian women”

Co-Authors: R. Hockey & A. Dobson

Poster Awards

Leuko Sports Medicine Best Poster – Clinical Sports Medicine (\$500)



Joanne Kemp

Melbourne School of Physiotherapy and Melbourne School of Engineering, University of Melbourne

"Measures of physical function of the hip"

Co-Authors: A. Schache, Z. Machotka & K. Crossley

Deakin University Centre for Exercise and Sport Science Best Poster – Exercise and Sports Science (\$500)

Adam Semciw

Department of Physiotherapy and Musculoskeletal Research Centre, La Trobe University

"Intramuscular EMG placement for two segments of gluteus minimus and three segments of gluteus medius with unique orientation and function"

Co-Authors: T. Pizzari & R. Green

Elastoplast Sport Best Poster – Injury Prevention (\$500)

Ian Stewart

Queensland University of Technology and Institute of Health and Biomedical Innovation

"The Hurt Locker": Heat strain in explosive ordnance disposal"

Co-Authors: A. Rojek & A. Hunt

Elsevier Best Poster – Physical Activity and Health Promotion (\$500)



Tanya Cates

La Trobe University

"A qualitative thematic analysis: Identification of factors related to the engagement of children in physical activity"

Co-Authors: M. Spittle & S. Malcolm

Asics Medal Best Paper Overall Q & A



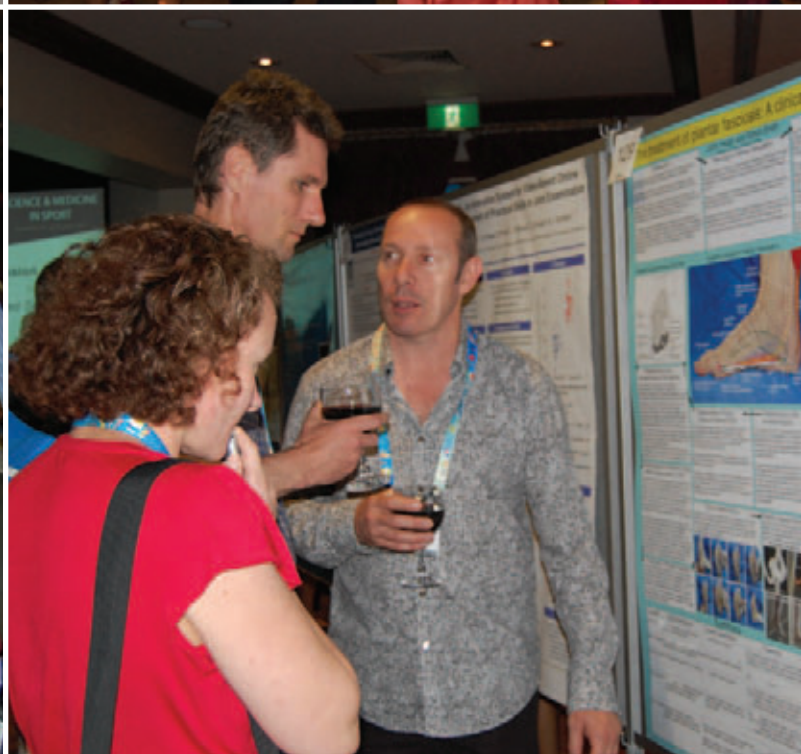
Mark Doherty presenting the Asics Medal to Catherine Wild.

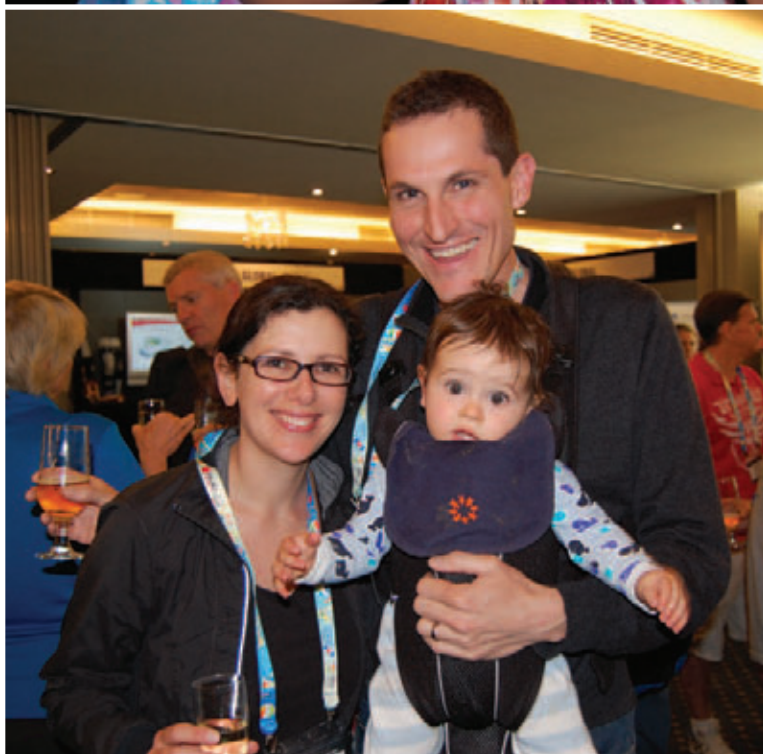
Sport Health sat down with Catherine Wild and asked a few questions on the recent recognition and success of her research, *Does higher anterior knee joint laxity alter landing biomechanics in pubescent girls? Implications for non-contact ACL ruptures.*

Congratulations on your Asics medal win. Can you tell us about your research?

Thank you! I am currently a PhD student in the Biomechanics Research Laboratory at the University of Wollongong. I first got the taste for research in the third year of my Exercise Science degree, when my biomechanics lecturer, Professor Julie Steele, introduced me to the Biomechanics Research Lab, where I became involved in a variety of research projects, from breast motion to children's feet. This was when I realised the many possibilities of research and how exciting research is!

As a keen sports player myself, and a child who experienced such an immense growth spurt, I wanted to look further into this area and so it gave me the idea of where to take my research. Sports injuries are highly prevalent during the adolescent growth spurt and girls sustain more soft-tissue injuries (i.e. ACL ruptures) than boys. It is widely known that women are exposed to a greater risk of sustaining an ACL





injury compared to men, but this gender divide actually becomes apparent from the onset of puberty. This is what led me to my PhD question. I wanted to investigate the longitudinal changes in hormones, lower limb strength, flexibility and landing technique during the adolescent growth spurt in girls, to determine any changes that occur during this time that may explain the gender disparity in ACL injury risk. This has involved tracking 10–13 year old girls during the 12 month period of their growth spurt. During this time I measured their height, mass, lower limb strength and flexibility monthly, and their oestrogen levels, knee laxity and landing technique every 3–4 months. The data collection period was extremely time consuming, but it was also very rewarding and the kids were a lot of fun to work with!

This then brought me to the research I presented at ACSMS: “Does higher anterior knee joint laxity alter landing biomechanics in pubescent girls? Implications for non-contact ACL ruptures.” There is a lot of speculation in the literature that greater anterior knee laxity is a risk factor for increased ACL injury risk, as it is thought to decrease knee joint stability. However, we really don’t know whether higher anterior knee laxity poses a greater risk of injury during landing. What was interesting was that these girls with higher anterior knee laxity activated their hamstring muscles much earlier than the girls with lower anterior knee laxity. We speculate this may be a mechanism to protect the ACL in a more unstable knee.

Now we are looking at the longitudinal landing data to see whether this muscle activation pattern changes throughout the growth spurt, particularly with respect to changes in knee laxity. Hopefully this will help to more accurately determine a time during the growth spurt when girls are most ‘at risk’ so we are better able to monitor our athletes during this time, whilst still allowing girls to play sport!

How did it feel to take out the top prize?

I was rather surprised to hear my name read out at the banquet dinner. In fact, it took a few days for the reality of the situation to truly set-in! But it was undeniably very exciting, and a memory that I will treasure for many years to come! It was an honour to be awarded this prize, especially as it was selected by such an esteemed panel of judges. This award also acknowledges the hard work of my co-authors and supervisors, Professor Julie Steele and Dr Bridget Munro, who have been every bit supportive throughout my PhD. They are tremendous supervisors, and I believe they deserve credit for this prize as well, as it has been their support and enthusiasm that has allowed me to achieve and be granted such a prestigious award!

Where to from here, both in regards to your research and personally?

At the moment I am busy writing-up my thesis, hoping to submit by January next year! Whilst doing that, I'm also looking for a job. I'm ready to graduate from being a student and join the big wide world, and continue researching, teaching and learning more and more as I go! As part of my award, I have been given the opportunity to present my work next year at the American College of Sports Medicine Meeting in San Francisco! This is such a fantastic prize, and one that will open up many opportunities to meet fellow researchers and expand my network.

The beauty of research and academia is that there are endless possibilities and you can travel almost anywhere in the world. This is an exciting aspect for me, as I would love the opportunity to move interstate and continue research in Australia, as well as the prospect of learning new skills and expanding my knowledge overseas. This is such an exciting time; finishing my PhD, finding a job and moving on in my life, and I am eagerly looking forward to seeing what the next few months have in store!

Anything else you would like to add?

I would like to take this opportunity to congratulate all of this years ACSMS winners, and I would also like to thank all of the judges for their time, as I know how busy they must have been running around to view all the presentations! I would also like to thank SMA for giving me the opportunity to present my work this year in Fremantle, as well as the honour of being awarded the Asics medal. I would again like to thank my supervisors Professor Julie Steele and Dr Bridget Munro, for all their support and encouragement throughout my many years of research! And of course I would like to thank Asics for continuing to support research in Australia, particularly lower limb research, and for sponsoring such a well-run event.

Finally, I'd like to thank each and every one of my many study participants and their parents for all their time and involvement in my study (and letting me into their homes every month for a year!). Their enthusiasm during my research was such a delight and made my data collection period such an enjoyable experience!

Catherine receives a \$3,000 prize and as the best new investigator was also awarded a presentation package to attend the American College of Sports Medicine Meeting in 2012. The presentation package includes a registration waiver and support for travel expenses (\$3,000), together with a guaranteed place in the American College of Sports Medicine program.

SMA Research Foundation Grants



At ACSMS 2011 it was announced that one of the SMA Research Foundation Grants is to be named after long standing SMA member, Dr Brian Sando. The 'Dr Brian Sando Clinical Sports Medicine Award' will be awarded for the first time in 2012 as a means of encouraging research which contributes to clinical sports medicine.

Brian has been involved with the Olympic and Commonwealth Games in a medical officer capacity since 1980 and was Senior Medical Director in '86, '88, '90, '92, '94, '96, '98, '00, '02 and '06. He is currently the AOC Medical Commission Chairman. Brian has been an SMA member since 1970 and held official positions including National Secretary 1985–86, National President 1989–1991, SA Branch President 1983–84, and a SA Council member for 19 years. He was the Chief Medical Officer of the Adelaide Crows from 1991–2008 and the Medical Officer of Norwood Football Club from 1964–1990. In 1995 he received a Medal of the Order of Australia and was inducted into the Sport Australia Hall of Fame in 2001.

Congratulations to the following researchers who were successful in the 2011 Research Foundation Grants: Chris Bishop, University of South Australia; Adam Culvenor, University of Melbourne; Eric Martin, University of Notre Dame, WA; Phillip Melville, University of Queensland; and Kate Pumpa, University of Canberra.

ASMF Fellows



Peter Terry with Order of Fellows President, Michael Kenihan.

During the Conference the ASMF Fellows enjoyed a wonderful evening at the ASMF Fellows Dinner, held at The View Restaurant.

Congratulations to Professor Peter Terry of Toowoomba, Queensland who was awarded Fellowship.

Peter is Professor of Psychology at the University of Southern Queensland and was formerly Psychology Coordinator at the Queensland Academy of Sport. Peter is one of the most experienced performance psychologists in the world. Over the past 25 years he has provided support to a host of international and professional performers, including Olympic medallists in nine sports. Peter has been team psychologist at eight Olympic Games and more than 50 other major international events. Author of over 150 publications, he is a Fellow of the British Association of Sport and Exercise Sciences and past-President of the Australian Psychological Society's College of Sport Psychologists.

ASMF Fellow Certificates of Appreciation were given to:

- | | |
|-----------------------------------|-----------------------|
| ■ Dr Gerard Taylor | ■ Professor Ken Fitch |
| ■ Associate Professor Gavan White | ■ Mr Stuart Gray |
| ■ Professor Alan Morton | ■ Dr Carmel Goodman |
| ■ Professor John Bloomfield | ■ Dr Duncan Sullivan |

Loud Shirt Day

The Friday during the Conference welcomed Loud Shirt Day. \$145.15 was raised through delegate donations. Sports Medicine Australia and ACSMS 2011 have matched these contributions and have made a total donation of \$300 towards helping the members of First Voice give deaf children sound and speech.

Save the date

2012

be active 2012

Sydney Convention Centre and Exhibition Centre

October 31 – November 3, 2012

The conference will incorporate the:

- 4th International Congress on Physical Activity and Public Health (ICPAPH)
- Australian Conference of Science and Medicine in Sport (ACSMS)
- Australian Physical Activity Conference (NPAC)
- Australian Sports Injury Prevention Conference (NSIPC)

For more information visit <http://sma.org.au/conference/future-conferences/be-active-2012/>

2013

The conference is heading to Phuket! At the ACSMS 2011 Conference Dinner, Mark Doherty, General Manager of Product, ASICS Oceania Pty Ltd announced that the 2013 Asics Conference of Science and Medicine in Sport would be held in the tropical location of Phuket, Thailand. More information will be available shortly. Watch this space.

Are breasts a problem for women in sport?



Dr Deirdre McGhee (Sports Physiotherapist) and Professor Julie Steele (Biomechanist), researchers from Breast Research Australia (BRA) at the University of Wollongong look at how to obtain correct bra support during physical activity.

Breast support recommendations for females who wish to participate in sport and physical activity have been a neglected topic in sports medicine, even in texts dealing with issues specific to the female athlete. This is surprising considering that breasts are common to all adolescent and adult females and begs the question, “*Are breasts a problem for women in sport?*” This question was first raised in the 1970s by American researcher, Christine Haycock, who conducted a survey involving 3,000 female college athletes and was surprised to find that 31 per cent complained of experiencing breast discomfort when they exercised¹. Biomechanical studies have since related this exercise-induced breast discomfort to excessive breast movement that can occur during physical activity, where as little as 2cm of breast displacement is sufficient to induce breast discomfort^{2,3}. This type of research has advanced the development of sports bras so that the bras are able to provide external breast support to limit breast movement during physical activity and sport.

Shoes for your breasts

Internally, breasts are dependent on support provided by the overlying skin and fine ligaments that are dispersed throughout the breast tissue, known as Coopers Ligaments¹. These anatomical supports, however, are unable to limit breast movement during exercise⁴. In fact, unsupported breasts have been found to move vertically as much as 12cm during running⁵, which can be reduced by at least 50 per cent by wearing a well fitted high-support sports bra⁴. Sports bras are therefore like *shoes for your breasts*. Although we would not think twice about changing our shoes to play sport, females don’t always adopt the same attitude for their bras. Unfortunately, a recent study by the University of Wollongong found that 80 per cent of adolescent female athletes had insufficient breast support relative to their bra size and type of physical activity they were involved in⁶. Only 41 per cent of 267 adult females (20–35 years) who were surveyed about their breast support choices actually wore a sports bra during exercise⁷.

“...a 17 year old, with B cup breasts, and playing lawn bowls may achieve enough support from a crop top, even if she is running.”

Performance and barriers to physical activity

Insufficient breast support is an important issue to address as it can negatively affect performance⁵, as well as act as a barrier to females participating in physical activity^{2,3}. Adolescent females typically show a decline in their level of physical activity relative to childhood⁸ and age-matched boys⁹, and this decline extends into adulthood¹⁰. Being self-conscious about their physical appearance when exercising¹¹ (such as bouncing breasts), is a known barrier to exercise for adolescent females. Conversely, for adult females, breast discomfort associated with exercise is the main barrier to exercising associated with breast support, particularly for women with large breasts^{2,3}. For example, women who experience excessive breast movement during activities such as running typically brace their arms against their torso in a subconscious attempt to limit their breast movement. This change in technique can alter the movement of their trunk and upper limbs during sport and, in turn, negatively affect performance.



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Fashion bra

Which bra?

Although the number of bras on the market can seem overwhelming to some females when attempting to purchase a new bra, there are basically three types of bras to choose from: sports bras, crop tops and fashion bras. Sports bras are known as ‘encapsulating bras’ as they support each breast in a separate cup in their attempt to limit breast movement. Crop tops hold and compress the breasts as a single unit against the chest to limit breast movement, whereas fashion bras are designed for their appearance appeal, not to limit breast movement¹². So when choosing a bra to wear during physical activity, the choice should be between a sports bra and a crop top.

Features of a high support bra¹²

When selecting a bra to exercise in, look for the following features:

- **Cups:** should cover the breasts completely using strong, supportive material (not lace/lycra).
- **Band:** should be made of strong elastic material, wide enough relative to the breast mass (A cup – one clip wide; B/C cup – two clips wide; D+ – three clips wide).
- **Straps:** must be wide and padded for comfort.
- **Front band:** should sit flat against the breast bone (sternum; this may not be possible for females with breasts larger than an E cup).
- **Underwire or soft-cup:** depends on the fit. If a bra has underwire, this underwire must not sit on any breast tissue. The soft tissues (fat and gland) of the breast are not designed to tolerate the compressive forces caused by underwire. Therefore, if the underwire of a bra does not sit on the ribs and sternum, a soft-cup version of the bra will be more suitable.

“...unsupported breasts have been found to move vertically as much as 12cm during running⁵, which can be reduced by at least 50% by wearing a well fitted high-support sports bra⁴. Sports bras are therefore like shoes for your breasts.”

How much support is enough?

When deciding on the required level of breast support, three factors need to be considered; age, bra size and the type of activity to be undertaken. On the lower end of the scale, a 17 year old, with B cup breasts, and playing lawn bowls may achieve enough support from a crop top, even if she is running. With advancing age, larger breasts and participating in activities that involve high impact or fast lower limb movement, the level of support required increases. At the top end of the scale, a 50 year old, DD cup, who is jogging, might need to wear two bras simultaneously, a sports bra plus a crop top, to achieve sufficient breast support. The key assessments are the amount of breast movement, which ideally is minimal, such that the breasts move in synchrony with the trunk, with minimal or no breast discomfort¹².

“Is it that hard to get it right?” men commonly ask; isn’t it just “cups at the front, and clips at the back?”

What about bra fit?

Correct bra fit is just as important as selecting the right type of bra. The most highly supportive sports bra will not be effective in limiting breast movement if it is either too big or too small¹³. Research suggests that incorrect bra fit is a very common problem in both adolescent and adult females, with 85% of both groups found to be wearing ill-fitting bras^{5,13}. Another common

issue found was 'wearing a bra long after it's used by date', with comments such as "I wear my old bra to training and save my new bra for competition"⁵. Once the elasticity of the bra band has decreased and the material starts to break down, it is time to stop wearing the bra as it can no longer provide support, just like a worn out pair of running shoes can no longer provide support and cushioning. Research has also found that both adolescent and adult females do not usually use professional bra fitting services, commonly fitting themselves^{5,13}. "Is it that hard to get it right?" men commonly ask; isn't it just "cups at the front, and clips at the back?" Unfortunately, getting the correct bra fit has been made much more difficult than it need be. This is not because correct bra fit is rocket

science, but because this important topic of breast health education has been neglected and because bra sizes are not standardised. Therefore, it is common for women to correctly fit a range of bra sizes. On the positive side, a study from the University of Wollongong found that providing young female athletes with an easy-to-understand evidence-based booklet on breast support and bra fit, *Sports Bra Fitness*, was effective in improving the knowledge, bra fit and level of breast support worn by adolescent females during exercise⁵.

"The most highly supportive sports bra will not be effective in limiting breast movement if it is either too big or too small¹³."

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What is correct bra fit?¹³

To ensure a bra fits correctly, check the following features:

- **Cup:** no wrinkles or gaps (too big), and no bulging of breasts over the top or sides of the cup (too small).
- **Band:** does not ride up when moving the arms above the head (too big), and no flesh bulging over the top edge of the band (too small).
- **Straps:** not sliding off (too big), and not digging in (too small).
- **Front band:** sits flat against the sternum.
- **Underwire:** sits on the ribs and the sternum, not on any breast tissue (too small).

“...a 50 year old, DD cup, who is jogging, might need to wear two bras simultaneously, a sports bra plus a crop top, to achieve sufficient breast support.”

What recommendations are necessary for breast health in sport?

- Breast support can be a sensitive issue, especially to adolescent females or females with large breasts. Coaches of adolescent females are encouraged to address the topic through mother/daughter education sessions or via allied health professionals, such as physiotherapists. Health professionals can also address the topic of insufficient breast support when treating female patients, particularly those patients with large breasts who are suffering from posture-related musculoskeletal problems such as headaches and neck, back and arm pain. For these females, breast support and bra fit education should be part of their overall treatment plan.
- Organisations and leaders in sport need to consider breast support when choosing and designing uniforms/costumes, particularly for adolescent athletes. Uniforms need to be able to allow athletes to wear a variety of breast support options, particularly accommodating the variety of strap configurations that are commercially available. This is particularly an issue in sports that do not allow bra straps to be seen.

Exercise and breast support

Sports Medicine Australia in conjunction with the University of Wollongong have developed a *Exercise and breast support* fact sheet which offers female athletes of any age a simple, easy-to-read guide to assist them independently choose a supportive, comfortable sports bra that fits correctly. It is a MUST read for any female involved in sport/physical activity. Copies can be attained from: <http://sma.org.au>.

Dr Deirdre McGhee

Professor Julie Steele

Dr Deirdre McGhee (Sports Physiotherapist) and Professor Julie Steele (Biomechanist) are researchers from Breast Research Australia (BRA) at the University of Wollongong. Contact details: dmcghee@uow.edu.au and julie_steele@uow.edu.au.

References, as indicated within the article, are available at sma.org.au/publications/sport-health/



Dr Deirdre McGhee and Professor Julie Steele.

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Sports injury prevention; Maximising the public health benefit



Alex Donaldson highlights the fact that maximising the public health benefit of injury prevention programs in community sport requires a combination of the right program and the right delivery plan.

In the Autumn 2011 issue of *Sport Health*, Professor Caroline Finch introduced the NoGAPS (National Guidance for Australian Football Partnerships and Safety) project, a major initiative to develop and disseminate an exercise-training program to prevent leg injuries in community sport. (1) This project builds on the idea that, to maximise public health impact, we need to get sustained adoption and implementation of the NoGAPS exercise-training program by community Australian football players. This will require both the right program content and the right program delivery process (See Figure 1).

Developing the right program

Identifying a need

Leg injuries are the most common community Australian football injuries and they can result in significant time-loss from participation and medical costs. The most important leg injuries to prevent are hamstring, hip adductor and calf muscle strains, and ankle ligament and knee ligament ruptures and sprains. (2) This evidence confirmed the leg injury prevention focus of the NoGAPS project.

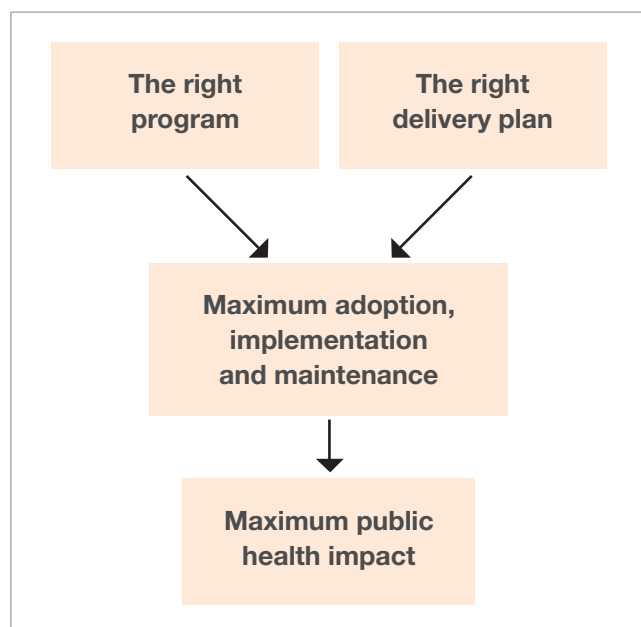
Identifying a solution that works

Evidence from around the world (3–5) shows that many leg injuries can be prevented through targeted training incorporating structured warm-up, balance training, side-stepping/cutting skills training and jump/landing training. This research evidence informed the development of the NoGAPS exercise-training program which, if performed as prescribed, has a good chance of substantially reducing the risk of leg injuries for community Australian football players.

Making sure everyone agrees

To finalise the content of the exercise-training program, an expert consultation was held with people who really know about designing conditioning programs to prevent injuries in Australian football. Agreement on the content of the exercise-training program was obtained from experts from the Australian Football League (AFL) Sports Science Advisory Group, the AFL Physiotherapists Association; the AFL Medical Officers Association; and other experts not directly involved in Australian football. This helped ensure that the exercises included in the program are both likely to prevent leg injuries and suitable for community Australian football players.

Figure 1: Principle behind the NoGAPS project



“A key to developing the right program is making sure that the people who you want to use the program can understand it and use it in the way that you want them to.”

Identifying a solution that is likely to be used

A key to developing the right program is making sure that the people who you want to use the program can understand it and use it in the way that you want them to. Having established the content of the NoGAPS exercise-training program, we are now getting feedback about the program from community Australian football representatives. This is being done in two ways. Firstly some focus group discussions are being held with community football administrators, coaches and players to find out what they think of the program. These consultations will provide important feedback about the way the program is presented, the language and photos that are used in the program guidelines, and whether those who will be asked to deliver and participate in the program (i.e. community Australian football coaches and players) can understand what they need to do. We will also get an understanding of the barriers that community administrators, coaches and players might experience when trying to adopt and implement the program and some strategies that could be used to reduce or overcome them.

Secondly, some community football coaches will deliver the program to their players in a trial to see if the coaches can follow the exercise-training program guidelines and if they can deliver the program as intended. This will also identify if community football players can understand what their coaches are asking them to do and if they can actually perform the exercises as required to maximise the injury prevention and performance benefits. We need to know that the exercise-training program is easy to use by both coaches and players; is not too time consuming; and can be easily integrated into the way that community football coaches normally go about coaching their groups of players.

The information gathered from these two activities will be used to refine and modify the exercise-training program and the way it is presented. It will also help to ensure that the program ‘fits’ well into the everyday environment of community Australian football.

Developing a delivery plan that is likely to be successful

There is no point, from a public health perspective, having the best injury prevention exercise-training program if no community football coaches or players actually know about it, decide to use it, use it in the right way or use it over a long period of time. Developing the right program is an important part of the NoGAPS project but it is only the first stage. Step five of the Intervention Mapping health promotion program planning process (6) (view Table 1 overleaf) will be used to develop a delivery plan that will maximise the adoption and implementation of the exercise-training program among a targeted group of community football clubs, coaches and players.

“Leg injuries are the most common community Australian football injuries and they can result in significant time-loss from participation and medical costs.”

In partnership with representatives from all levels of community football (e.g. regional development officers, league and association executive officers, club administrators, team coaches and players), we will develop the delivery plan by working through a series of seven tasks – from identifying potential exercise-training program adopters and implementers to designing specific interventions to enhance adoption, implementation and sustained use of the exercise-training program (See Table 1).

We believe that by having the right program (one that is needed, based on the best available scientific evidence, and informed by both expert and community end-user opinion) and supporting it with the right delivery plan (one that takes into consideration the implementation context and is informed by evidence, theory and community end-user opinion) we will maximise our chances of preventing leg injuries in community Australian football.

“There is no point...having the best injury prevention exercise-training program if no community football coaches or players actually know about it, decide to use it, use it in the right way or use it over a long period of time.”

Over future issues of *Sport Health*, the NoGAPS partnership team (listed opposite) will publish updates from the project as new insights and knowledge is obtained.

References, as indicated within the article, are available at sma.org.au/publications/sport-health/

Table 1: The seven Intervention Mapping Step 5 tasks to maximise adoption, implementation and sustain use of the NoGAPS exercise-training program among community football clubs, coaches and players

Task number	Task description
Task 1	Identify potential NoGAPS exercise-training program adopters and implementers (e.g. club administrators, coaches, physiotherapists, fitness and condition staff, players, sports trainers etc)
Task 2	Ensure the NoGAPS exercise-training program adoption and implementation planning group includes representation from potential program users and gatekeepers
Task 3	State NoGAPS exercise-training program use outcomes and specify adoption, implementation and sustainability performance objectives Specific question to be answered: What do potential NoGAPS exercise-training program users need to do to constitute adoption, implementation and sustained use of the program?
Task 4	Specify determinants of NoGAPS exercise-training program adoption, implementation and sustainability Specific question to be answered: What will influence whether potential NoGAPS exercise-training program users do what is needed to adopt, implement and use of the program over a sustained period of time?
Task 5	Create a matrix of change objectives for NoGAPS exercise-training program adoption, implementation and sustainability Specific question to be answered: What needs to change in relation to the determinants or influences on NoGAPS exercise-training program users adoption, implementation and sustained use of the program?
Task 6	Select methods and practical applications for NoGAPS exercise-training program adoption, implementation and sustainability
Task 7	Design interventions for NoGAPS exercise-training program adoption, implementation and sustainability

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Searching for the holy grail; Wallabies athlete load monitoring



Image courtesy of Australian Rugby Union.

APA Sports Physiotherapist and physiotherapist for the Australian Wallabies, James Sutherland writes about player load monitoring in the lead up to the recent Rugby World Cup in New Zealand.

There are a number of methods to monitor an athlete's training and competition loads, and a wide variety of tools that can be utilised, from simple range of motion measurements to the more advanced use of GPS units to provide quantifiable reams of data. Regardless of the budget of the sports team you are working with and which tools you decide to use, the primary purpose of athlete load monitoring is to maximise sporting performance and minimise the risk of injury (or lost training days).

In order to do this, you need to ensure that you use your tools to:

1. Collect/record the information regularly and consistently to ensure reliability
2. Verify it is practical to obtain (i.e. if you are travelling and in hotels etc)
3. Analyse the information at the time of collection
4. Interpret the results against agreed team specific standards
5. Discuss the results with the relevant medical staff, coaches and athletes
6. Effect immediate change to the planned training sessions for that day/week
7. Assess and review their effectiveness at achieving your agreed goals.

What follows is a series of tools we used within the Wallaby rugby program as part of our preparation for the recent World Cup in New Zealand.

“Every athlete is required to complete their own self-evaluation every Monday...and Friday...done via an email to their Blackberry mobile and/or playbook.”

Daily measures

GPS and heart rate monitoring

The Wallabies only commenced using GPS units in 2010 when the International Rugby Board approved GPS to be used in international test matches/Super 15 rugby. We have been using GPS units and heart rate monitors to quantify the athletes' actual training load and performance, such as training time (minutes), distances ran (total metres), speeds produced (in relation to the individual's maximum velocity and aerobic speed), and number of acceleration/de-acceleration/agility movements (in a standard test match). The raw data is modified into various formats for the purpose of: (1) determining what the athletes actually do in a test match/Super 15 game, (2) modify our planned training loads to ensure the athletes are training at the levels required to prepare for their game (duration, intensity, agility and skill requirements), (3) monitor how athletes are coping with the current training/playing loads, and (4) prepare a 'return to sport' rehabilitation program for all our injured athletes to follow, so that the athletes reach the required level of fitness to participate in training and be available for selection.

Training sessions

All field training sessions are recorded (video camera, Blackberry playbooks) and then coded (using Verusco software) for the athletes to review their position, role play/patterns and skill execution on laptops at the team hotel at their leisure. This includes all the skill components of lineouts, scrummaging and goal kicking.

Physiotherapy treatment

This is available daily for athletes to book via an appointment board outside the physiotherapy room.

Medical meetings and reviews

The medical team (sports physician and physiotherapists) and conditioning coach meet two to three times per day to discuss the individual training status of athletes. Typically, this is before the morning training session, after the training session (for any modifications to the afternoon's weights sessions) and at the end of the day, post-afternoon physiotherapy treatment, to plan the next day's training status. Any changes are then communicated to the coaches to modify training as needed.

Weekly measures

Medical screening and online Injury Prevention System

These are completed every Monday morning (four hours) with each athlete required to complete their online Injury Prevention System (IPS) (developed by the Australian Rugby Union).

This IPS takes approximately 10 minutes to complete and has a series of questions covering the athlete's physical measures (weight, sit and reach, ankle dorsiflexion and passive shoulder internal rotation), football played (i.e. the level they played on the weekend (test match, club football), the total minutes played), any injuries they sustained (new or old; if so, what) and a series of subjective self-rating scales (i.e. how they are mentally and physically, any other contributing stress factors such as study, life, work, family etc). Each of their answers is 'matched' to their individual season normal averages, as well as compared to the squad as a whole. A red flag is activated if any of these measures are above/below a set percentage from the athlete's normal values. Every athlete is then required to meet with the team sports physician to discuss their results and assess any injury they may have with the view of determining their training status for Monday.

“There are a number of methods to monitor an athlete's training and competition loads, and a wide variety of tools that can be utilised.”

At the conclusion of the morning, the IPS prints up a summary squad report (two to three pages) for review by the medical team and conditioning coach, with the training status of all athletes then determined, that is, full/modified/non-training, investigations required (XR, MRI etc), rehabilitation (cross-training, pool session, running program), contact/non-contact and skill modifications (lineouts, scrums, kicking) for each athlete. This is then communicated to all our team coaches for any training modifications that may be required.

Physiotherapy review and rehabilitation programs

After completing the IPS/sports physician review, each athlete sees one of the two team physiotherapists to assess/discuss their current injury status and review their ongoing individual rehabilitation programs. Every athlete has a written rehabilitation program (strength, proprioception, agility, stretching, triggers, and recovery principles) that covers their current acute injuries and/or injury history profiles (i.e. shoulder and ACL reconstructions). This is reviewed and progressed as required for the coming week, with athletes required to complete it daily.



Image courtesy of Australian Rugby Union.



Image courtesy of Australian Rugby Union.

We also complete weekly strength dynamometer testing (shoulders, pelvis/groin) on various athletes to monitor their musculoskeletal recovery from weekend games and weekly training loads.

Specific flexibility and rehabilitation group sessions

Each week we run compulsory flexibility/stretch sessions (twice per week) for the front row forwards, and rehabilitation sessions (twice per week) for those athletes for whom we need to spend some additional time to ensure they master and progress their individual rehabilitation.

The 'front row flexibility' session is specifically directed at ensuring each of these athletes has the ability to reach and maintain the required 'scrumping position'. The athletes perform a series of joint mobilisations (lower back, ankle), stretches (lower back, psoas, gluts, and hamstring) and neural glides (lower limb) for approximately 20–30 minutes.

The 'rehabilitation' session involves approximately four to eight athletes who are either new to the team and relatively young in terms of playing years, are returning from long-term injuries (i.e. ankle syndesmosis, shoulder reconstructions), or simply prefer to be challenged in a group setting.

Athlete self-evaluation (Brain Solutions Training and My Calm Beat)

Every athlete is required to complete their own self-evaluation every Monday (two days post-test match; recovery) and Friday (one day prior to next test match; readiness to play). This is done via an email to their Blackberry mobile and/or playbook, so that it can be completed in their own time, and requires the following: (1) calmness score (out of 100) (= My Calm Beat), which is a measure of the athlete using their optimal breathing rate to maximise their heart rate variability. The higher the score, the more efficient the body is at maintaining its ideal steady state, which leads to an improved chance of executing a successful sporting skill/event; (2) List a Team Impact you provided/experienced from a team-mate; and (3) Self Evaluation Score Mentally and Physically (out of 10).

Measures completed at regular intervals throughout the season

Dual energy X-ray absorptiometry (DEXA) scans

These are completed at regular stages (June (start of the season), August (post Tri-Nations tournament) and prior to the spring tour (November)) throughout a season and are used to accurately determine an athlete's body composition (total body muscle mass (kg), total body fat mass (kg), total body fat percentage, and lean muscle/fat mass of the trunk and each of the arms and legs (g)). This allows the coaches and conditioning staff to specifically modify/target an athlete's required weight and body composition for their playing position, which then has consequences for that athlete's specific diet caloric intake and expenditure (additional conditioning).

"Each of their answers is 'matched' to their individual season normal averages, as well as compared to the squad as a whole. A red flag is activated if any of these measures are above/below a set percentage from the athlete's normal values."

Fluid balance assessments (urine analysis and sweat tests)

These assessments are done once or twice per year on the entire squad, with every athlete having their fluid balance (hydration status) on a standard training day assessed and measured (i.e. pre-training weight, urine sample/losses, fluid loss (sweat and urine), measured fluid volume intake during and post-training session, post-session weight). Each athlete is supplied with their results and recommendations as a direct educational tool to improve their potential performance.

Monitoring injured athletes not with the team

Our season consists of several tournaments that require significant travel and time away from our main training base in Sydney. This year we have completed a Tri-Nations tournament (between Australia, New Zealand and South Africa, July and August 2011), the World Cup (New Zealand, September and October 2011) and a spring tour (United Kingdom, November 2011) to complete our 2011 season.

Given the nature of our season, any athletes that sustain significant injuries (i.e. are not available for greater than three to four weeks) return home to their franchise state (i.e. Brumbies, Force, Rebels, Reds, Waratahs) to complete their rehabilitation, until they are declared fit to train or are available for selection. This involves a coordinated approach between the conditioning coaches and medical teams of both the Wallabies and the franchises, to ensure the athlete's return to full training is maximised.

In order to do this, all athletes' planned training sessions (physiotherapy rehab, weights, field sessions) are overseen by the local franchise staff, with daily feedback provided (via email, phone and/or conference calls) regarding their progress to the relevant Wallabies staff. All field sessions (i.e. running, agility, graded contact, kicking, lineouts and scrummaging) are completed with GPS monitoring and video footage (via Blackberry playbook), which is then uploaded daily for review by the Wallaby medical/conditioning coaches. This provides invaluable information and feedback on how the athlete is progressing with their rehabilitation and allows us to modify their programs as required, as well as keep the coaches informed (and show them) when the athlete is expected to become available for selection. Throughout this process the athlete also continues to complete their weekly online IPS medicals.



Image courtesy of Australian Rugby Union.

The concept of an ideal method for load monitoring is almost like the search for the Holy Grail: the balance between training load, training effect, athletic performance, contributing factors (physiological, psychological, biomechanical, environmental) and tissue failure/injury is a constantly evolving equilibrium. All sports physiotherapists need to be informed, proactive and effective contributors, whether working with individual athletes or within a sports team environment.

“The concept of an ideal method for load monitoring is almost like the search for the Holy Grail.”

James Sutherland

After qualifying as a physiotherapist in 1998 (Sydney University), James Sutherland completed his allocation at St Vincent's Hospital before commencing in private practice. In 2002 he established Balmain Sports Physiotherapy while working with the Australian water polo teams. Following the completion of a Masters in Sports Physiotherapy (Griffith University) and gaining an APA Sports Physiotherapist title (2006), James started working with the Wallabies in 2008 and is now principal physiotherapist at Balmain Sports Medicine.



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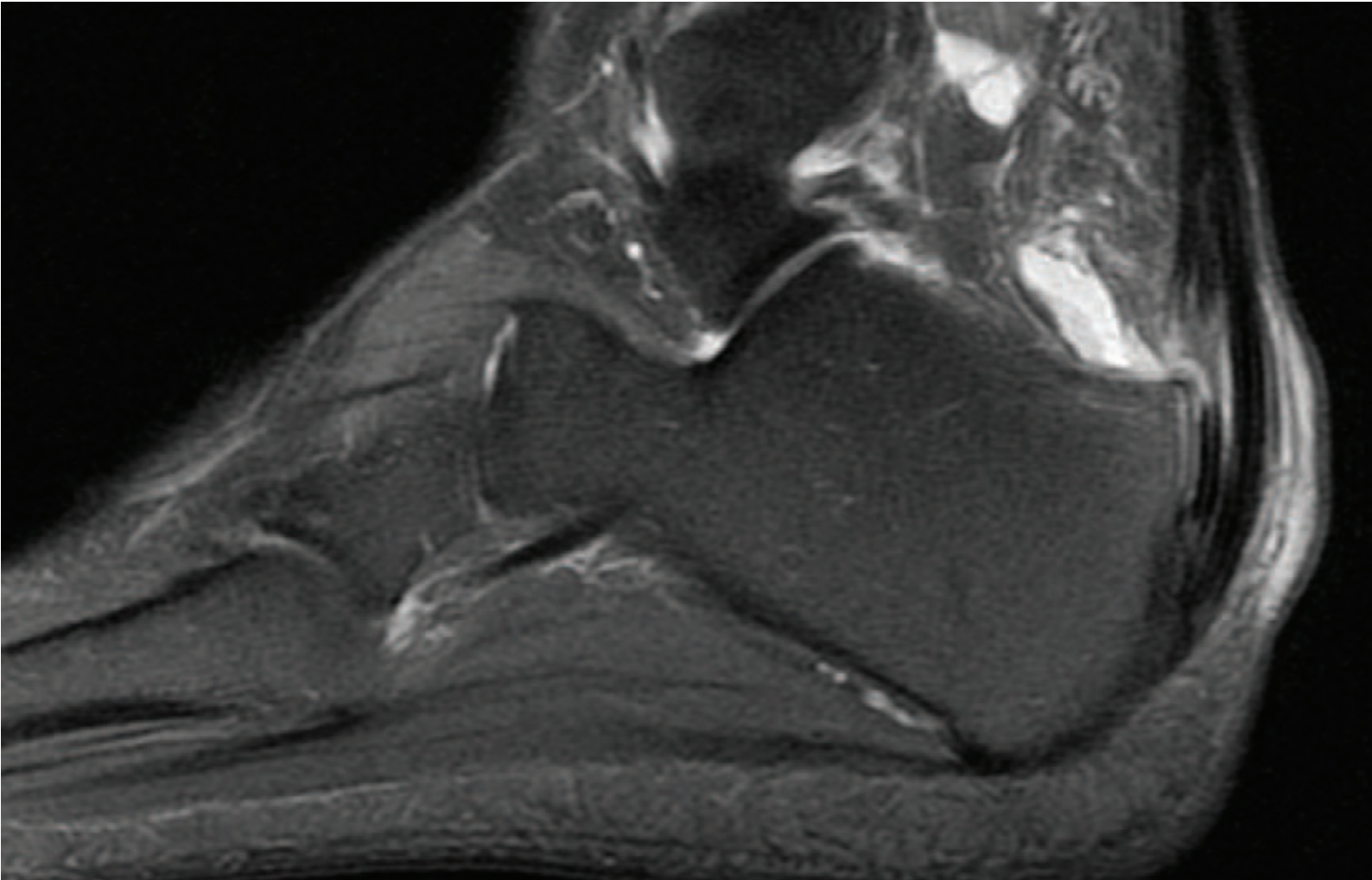
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Rash diagnosis: Inflammatory arthritis presenting in athletes



Achilles enthesitis – a common manifestation of seronegative arthropathy.

Australasian College of Sports Physicians (ACSP) President, Dr David Hughes highlights that inflammatory arthritis is a common presentation in the young athletic population with the patient often incorrectly attributing symptoms to a sporting injury.

Sometimes you just get lucky. In February 2003 I had just started working in London, establishing a specialist sports medicine practice in an environment where most patients and most doctors had never heard of a Sport and Exercise Medicine Physician. I was struggling with ‘patient deficit disorder’ and was feeling a touch ambivalent about the decision to drag my family to London on this grand adventure.

My ‘lucky break’ came when a professional football player from the English Premier League travelled down from the Midlands with his physiotherapist for a consultation regarding

his groin injury. This fellow was being paid £60,000 per week and had not played for the preceding six weeks. From the outset, the history didn’t sound quite right. There was no history of trauma or sudden event. The pain felt better when he was warm and he could hardly feel it when he was exercising hard. Once he stopped exercising, even briefly, he could not get going again. He felt ‘rusty’ and heavy in the legs each morning but improved significantly after having a hot shower. The time and effort required to warm-up was gradually increasing and the pain after exercise was getting worse. Rehabilitation exercises were not helping. This particular athlete had an aversion to taking medication. The pain sounded suspiciously inflammatory and I started going through my usual list of questions looking for evidence of inflammatory arthropathy. When I asked him if he had a rash, his eyes widened and he said “You mean like this?”



REPAIR, RECOVER & REFUEL.

The Melbourne Vixens netball team represent their home city in the elite Australia and NZ Championship competition. The Melbourne Vixens includes Australia's best female athletes and a new generation of netball stars, with seven Australian squad members in the team, including recent World Champions Julie Prendergast, Bianca Chatfield and two-time Commonwealth Games gold medallist Sharelle McMahon.

Sports Dietitian Kerry Leech speaks with Sharelle McMahon, captain of the Melbourne Vixens Netball team.

Q. What is your favourite food?

I'm a little partial to chocolate but my favourite meal is chicken and vegetable risotto.

Q. Cereal or toast for breakfast?

Definitely a cereal girl, eating muesli, yogurt and milk helps me to keep going through the morning.

Q. Sharelle, you are working with Netball Victoria as well as playing and training with the Vixens - how do you fit it all in?

I'm very busy. I manage it with a very up to date diary!

Q. So how do you manage healthy meals on the run?

I need to be organised and pack food each morning. It makes drinks like Sustagen important as I can have them in the car on the way to or after training.

Q. What flavour Sustagen is your favourite?

That's easy, Chocolate - I told you I am a chocolate girl!

Q. How do you feel Sustagen helps your recovery?

Netball is a hard game, I tend to come out of each game with a few bumps and bruises. Sustagen after each game helps to get the recovery process started and provides a great source of protein and carbohydrate.

Q. So what now for Sharelle McMahon?

The Vixens are finished for the season but the Australian team has international matches over the next few months against New Zealand and England. So plenty of training camps, travel and tough matches. No slowing down for me!



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AUSTRALIA

He lifted up his shirt revealing large areas of red, irritated skin with well-demarcated lesions, covered in flaky, silver-coloured scales. This was psoriasis and the player had inflammatory joint pain associated with psoriasis, otherwise known as psoriatic arthropathy. I convinced the player to try a course of anti-inflammatory medication and he rang me two days later to say that he was completely pain free. He played the following weekend and things improved (for both of us) thereafter.

Inflammatory arthritis can present in any age group and some forms of inflammatory arthritis present commonly in young adults. The most commonly known inflammatory arthritis is rheumatoid arthritis. This is a chronic, systemic condition that often progresses to cause joint destruction and significant disability. Rheumatoid arthritis can present at any age but peak presentation is in the fourth and fifth decades of life. There are many extra-articular manifestations of rheumatoid arthritis including skin lesions (nodules), cardiac, pulmonary, ocular and vascular manifestations. Patients will often have systemic symptoms such as weight loss, fever and malaise. As well as having elevated inflammatory markers, patients with rheumatoid arthritis will have elevated rheumatoid factor in the blood, in over 70 per cent of cases.

“Rheumatoid arthritis can present at any age but peak presentation is in the fourth and fifth decades of life.”

Gout is a crystal arthropathy which is predominant in males and is due to formation of uric acid crystals in synovial fluid. Hyperuricaemia can occur due to a number of causes including genetic factors and a diet high in purine foods. While gout can occur in the young adult population, typical presentation is on the fifth decade of life. The joint affected by gout is usually red, hot and exquisitely tender to touch.

The inflammatory arthritis that more or commonly presents in young adults is seronegative arthritis, so called because it is an inflammatory arthritis with an absence of rheumatoid factor in the blood. Seronegative arthritis includes a number of conditions including ankylosing spondylitis, psoriatic arthritis, enteric arthritis, Reiter's syndrome and undifferentiated arthritis. Seronegative arthritis is more prevalent in males where rheumatoid arthritis is more prevalent in females.

Ankylosing spondylitis (AS) normally starts in the second decade of life with back pain being the main clinical symptom. In 90 per cent of cases the disease starts with sacroiliitis. As the course progresses, the whole of the spine can be affected. The classic radiological finding is syndesmophytes,



Sacroiliitis is usually the first manifestation of AS.

although these occur in only 50 per cent of AS cases. Typically there is a delay of between 5 and 10 years from the initial occurrence of AS symptoms and the diagnosis being made. The reasons for the significant delay in diagnosis includes low index of suspicion among assessing health practitioners and the modified New York criteria for AS which necessitate radiological changes in the sacroiliac joints on plain x-ray. Such changes occur late in the progression of the disease and inflammation of the sacroiliac joints can be detected at a much earlier stage with MRI.

Psoriatic arthropathy develops in at least 5 per cent (and up to 25 per cent in some studies) of patients with psoriasis. Psoriatic arthropathy can be differentiated clinically from rheumatoid arthritis in a number of ways. Rheumatoid arthritis tends to affect the wrists, MCP joints and PIP joints in a symmetrical pattern. Psoriatic arthropathy tends to affect the DIP joints in an asymmetrical fashion. Often only one or two digits will be affected in the hands or feet. Patients may present with the classic single-digit swelling known as 'sausage digit' or dactylitis. The digit will be uniformly swollen along its length secondary to simultaneous inflammation affecting the flexor tendon and the synovium of the digit. Many symptoms are common to several of the subtypes of seronegative arthropathy. In 50 per cent of cases psoriatic arthropathy for instance, spinal involvement is present, making it difficult to differentiate from ankylosing spondylitis. As with the other seronegative arthropathies, psoriatic arthropathy often affects entheses such as the Achilles enthesis and the plantar fascia origin. It is important to remember that other skin conditions such as skin infections can also be associated with seronegative arthropathy.



Index of suspicion – psoriasis.

Enteric arthropathy encompasses a group of inflammatory arthritides which share a common link to gastrointestinal pathology. Enteric arthropathy can occur in response to a gut infection and is thus termed a reactive arthropathy. Common pathogens include bacteria such as shigella, salmonella, campylobacter and yersinia, and parasitic infections such as giardia, cryptosporidia and strongyloides. Enteric arthropathy can however be caused by non-infective gut pathology such as inflammatory bowel disease, Crohn's disease, ulcerative colitis, intestinal bypass, coeliac disease, Whipple's disease and collagenous colitis. The patient may report an episode of diarrhoea followed shortly afterwards (often within a week) by spontaneous onset of inflammatory symptoms affecting joints and/or entheses.

Particularly pertinent to the young adult population is Reiter's syndrome. This condition, like enteric arthropathy, is a reactive arthropathy. It involves a classic triad of nongonococcal urethritis (often due to chlamydial infection), uveitis (usually one eye) and inflammatory arthritis. Given its association with chlamydial infection, this condition often presents in the sexually active young adult population.

“Inflammatory arthritis is a common presentation in the young athletic population. The patient may incorrectly attribute the symptoms to a sporting injury. The practitioner must be alert for this diagnostic possibility, when the history of onset and the pattern of pain suggest non-traumatic aetiology.”

“Psoriatic arthropathy develops in at least 5 per cent (and up to 25 per cent in some studies) of patients with psoriasis.”

What causes this association between non-musculoskeletal pathology and inflammatory arthritis? There are a number of theories. Certainly there seems to be a genetic predisposition. Human leucocyte antigen HLA-B27 is found in about 8 per cent of the Caucasian population but is found in 90 per cent of individuals with ankylosing spondylitis. HLA-B27 is also more common in the other forms of seronegative arthropathy, compared to the general population. If HLA-B27 is present in individuals with psoriatic arthropathy, enteric arthropathy or Reiter's syndrome, those individuals are more likely to have spinal manifestations of their disease. All forms of inflammatory arthropathy are more common in individuals who have first degree relatives affected by the condition. Not all individuals with HLA-B27 will develop inflammatory arthritis. It is postulated that individuals with HLA-B27 are susceptible to inflammatory disease but it takes an environmental insult or breach of the protective barrier (skin, urogenital mucosa or gastrointestinal mucosa) to trigger the disease. Antigens that breach the protective barrier may then elicit a pathogenic immune reaction in susceptible individuals.

“All forms of inflammatory arthropathy are more common in individuals who have first degree relatives affected by the condition.”

When a health practitioner is running a busy musculoskeletal practice, it is important to maintain an index of suspicion that inflammatory arthropathy may underlie presentations for a 'sporting injury'. The antennae should be up when an otherwise healthy patient develops significant musculoskeletal symptoms in the absence of an identifiable traumatic incident. The pattern of pain is important. Mechanical pain will often be exacerbated by movement and relieved by rest. In contrast, inflammatory pain will often gradually reduce with activity. Inflammatory pain tends to be worse at night, first thing in the morning and after prolonged immobility (e.g. sitting). The symptoms will often be relieved by a hot shower and may be dramatically relieved by anti-inflammatory medication. When the practitioner is suspicious that there may be an inflammatory condition underlying musculoskeletal symptoms, it is useful to have a ready checklist of questions to further explore the possibility.



Reiter's syndrome – the eyes have it.

Such questions might include;

- Do you suffer from skin infections, rashes or dandruff (dandruff is often a mild form of psoriasis)?
- Have you recently suffered from diarrhoea or do you have a history of any chronic bowel condition?
- Have you ever suffered from urinary tract infections, sexual transmitted diseases, or recently had unprotected sexual intercourse?
- Have you recently suffered from a painful red eye?
- Is there a family history of inflammatory arthritis of any type?

When performing physical examination, the clinician should look for signs including conjunctivitis, rashes, skin infections, pitting of the fingernails (often seen with psoriatic arthropathy), dandruff, warm swollen joints, rheumatic nodules, tender entheses and joint stiffness.

Appropriate initial investigations include C reactive protein, erythrocyte sedimentation rate, uric acid, antinuclear antibodies (elevated in SLE) and full blood picture. HLA-B27 may be requested depending on the chronicity/severity of the symptoms or their failure to respond to first-line treatment. If sacroiliitis is clinically suspected, MRI can detect inflammatory changes before chronic changes are detectable on plain x-ray. Peripheral joint imaging may be appropriate

“...it is important to maintain an index of suspicion that inflammatory arthropathy may underlie presentations for a ‘sporting injury’.”

according to the nature and severity of joint involvement. Depending on the associated symptoms, other investigations could include stool samples to identify GIT pathogens, chlamydia PCR and synovial fluid for microscopy.

Primary treatment for suspected seronegative arthropathy is often non-steroidal anti-inflammatory medication. In some cases of reactive arthropathy (enteric arthropathy or Reiter's syndrome) there will be a single presentation of joint symptoms which may or may not recur. A reducing regime of oral corticosteroid may be appropriate if non-steroidal anti-inflammatory medication is ineffective. Failure to respond to first-line treatment will often necessitate referral to a rheumatologist for consideration of disease modifying agents such as methotrexate, salazopyrin or new pharmacological modalities such as tumour necrosis factor blocking agents.

Inflammatory arthritis is a common presentation in the young athletic population. The patient may incorrectly attribute the symptoms to a sporting injury. The practitioner must be alert for this diagnostic possibility, when the history of onset and the pattern of pain suggest non-traumatic aetiology.

Dr David Hughes

Discipline group news and events

Australasian College of Sports Physicians (ACSP)

News:

- ACSP was recently admitted to membership of the Committee of Presidents of Medical Colleges where for the first time specialist Sport and Exercise Medicine Physicians will have direct representation along with all other specialist fields of medicine.
- Simultaneously ACSP is undergoing reaccreditation processes in both Australia and New Zealand as routine activities with the Medical Councils of both countries.
- ACSP continues to contribute to governmental and community working groups including topics as diverse as PCEHR, impairment tables for disability support, vocational accreditation of musculoskeletal physicians in NZ, scope of practice of pain medicine in NZ and NHMRC conflict of interest project.

Upcoming events:

- 26th ACSP Annual Scientific Conference
November 13 – 16, 2011
Hyatt Coolum, Coolum Beach Queensland
Online registration open
- ACSP Clinical Sports Medicine: Upper Limb
March 4, 2012
Sydney NSW
Online registration will open shortly.

For more information visit www.acsp.org.au

Exercise & Sports Science Australia (ESSA)

News:

- 'Safe' and 'appropriate' long-term physical activity programs for all Australians

Australia's leading exercise, fitness and sporting associations have joined forces to research, develop and implement a pre-exercise screening tool for adults to ensure Australians are receiving suitable exercise programs and advice for their current level of fitness.

ESSA, Fitness Australia and Sports Medicine Australia have jointly developed the Adult Pre-Exercise Screening System (APSS) that will now be recommended to their registrants, members, government and associated organisations.

The aim of the APSS is to establish a consistent approach for pre-exercise screening and ongoing management, ensuring that clients achieve better health outcomes and sustained physical activity throughout their lifespan.

Download and start using the tool at www.essa.org.au/for-gps/healthy-communities/

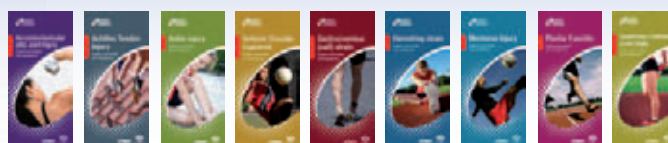
The supporting User Manual was funded by the Australian Government under the National Partnership Agreement on Preventive Health.

For more information visit www.essa.org.au



SPORTS INJURY FACT SHEETS

Sports Medicine Australia members can now display valuable sports injury prevention and management resources within their practice and even customise them with their own address and contact details.



For more information or for an order form visit <http://sma.org.au>



Sports Dietitians Australia (SDA)

News:

- SDA celebrated 15 years since its establishment with a successful cocktail party and free public lecture at Federation Square, Melbourne on October 14, 2011. SDA inducted its first Honorary Life Members – Lorna Garden and Glenn Cardwell at this event. Two new Fellowships were also conferred to Greg Cox and Sarah Dacres-Manning.
- A new Board was welcomed at the SDA AGM on October 14, 2011 who will come together in late November to review and plan the next 12 month's strategic activities.

Upcoming events:

- Nutrition for Exercise and Sport Courses
Victoria – February 18, 2012
New South Wales – February 25, 2012
- SDA is again delighted to partner with ESSA in it's 'Research to practice' conference to be held on the Gold Coast in April 2012.

For more information visit www.sportsdietitians.com.au

Sports Doctors Australia (SDrA)

News:

- SDrA has had a very busy year with negotiations for our future and developing ties and links with groups which may provide members with more opportunities and resources.
- SDrA has a new president, Brendan de Morton and vice president, Gavan White. SDrA members are encouraged to contact Brendan or Gavan with any questions, suggestions or concerns. For those who are not yet a member of SDrA please consider joining so you may contribute to the future of sports medicine in Australia.

For more information visit www.sportsdoctors.com.au

Sports Physiotherapy Australia (SPA)

News:

- Planning is well underway for the 2012 ACSP SPA Workshop to be held in Melbourne on April 20 and 21, 2012. The theme is to be 'Injury Prevention' and is for Sports & Exercise Physicians and APA Sports Physiotherapists. This follows on from the very successful workshop held in Canberra in 2010.

For more information visit www.physiotherapy.asn.au

The *Journal of Science and Medicine in Sport*

The year in review, the year ahead

As the *Journal of Science and Medicine in Sport* (JSAMS) approaches its 15th year of publication, albeit it was published under a different name for many years prior to this, it is time to reflect on the achievements, trends, highlights, and what is in store in times ahead. JSAMS has a broad brief in providing a highly respected outlet for research and review-based papers that have appeal to both practitioners in the sports medicine and sports science domains, as well as to researchers and students in academic settings – no easy brief to fulfil through a single journal. Despite this, JSAMS is well received by the SMA membership and its readership, and is rapidly becoming a port of first call for scientists and practitioners alike.

Journal publication has changed dramatically over the past decade. The advent of electronic journals, the ability to locate individual papers from one's computer desktop, the increased competition in the journal market, and the desire for on-time and up-to-date scientific and practice information are at the fore of these changes.



JSAMS has responded positively to these challenges over the past few years with the major achievement of rising to the top 10 of all journals in the Sports Sciences category of the ISI Web of Knowledge Journal Citation Reports. The significant increase in the Impact Factor of JSAMS places the journal in high esteem internationally. Another highlight in the past year has been that each day, on average, over 880 JSAMS papers are downloaded as full papers somewhere around the world – that is, approximately 320,000 papers each year across 95 countries. The countries with the highest number of downloaded papers (in order) are United Kingdom, Australia, United States, Iran, Canada, Malaysia, Brazil, France, China, New Zealand, Netherlands, Spain, Ireland, and South Africa. This is truly indicative of a highly respected international journal. A further significant achievement this year for JSAMS has been that papers have been submitted from over 40 countries to date, with the largest contributions from Australia, Brazil, United States, United Kingdom, Spain, Iran, and New Zealand.

The JSAMS podcasts have also been a great success this year. Downloadable from a range of outlets including iTunes, the podcasts tackle a range of contemporary sports medicine and sports science issues through interviews with world leaders in their disciplines.

As we look ahead to 2012 we aim to increase the number of papers we publish in clinical sports medicine fields whilst at the same time retaining the unique broad brief of the journal across both research and applied practice areas.

Gregory S. Kolt, PhD

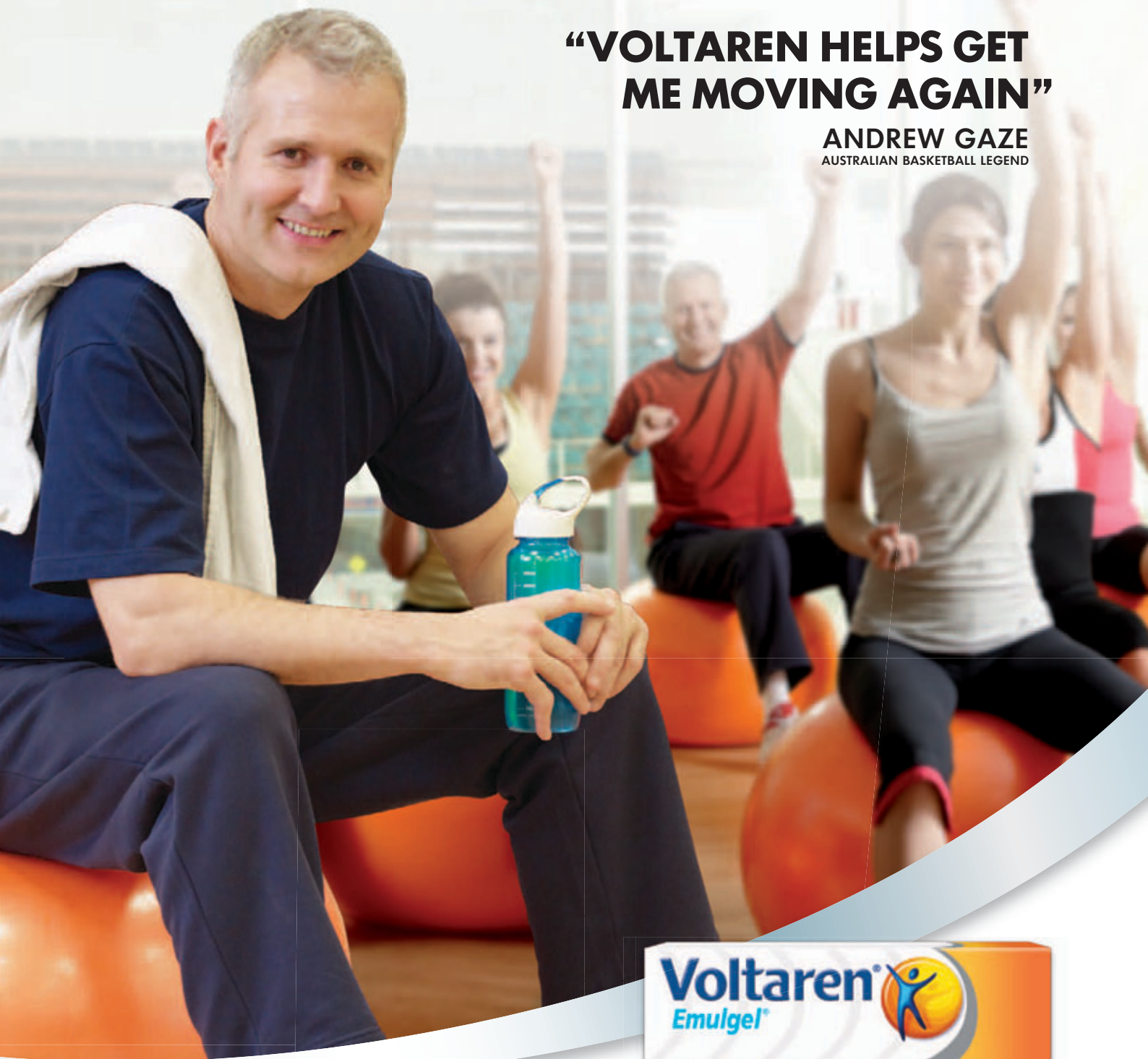
Editor-in-Chief

Journal of Science and Medicine in Sport



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