SPORT HEALTH

SPORTS MEDICINE AUSTRALIA

VOLUME 33 **ISSUE 4** 2015/2016

MANAGEMENT OF **EMERGENCIES** IN SPORT ISSUE

Defibrillators in local sport

Cardiac events in older athletes

The toll of sudden cardiac arrests

Wet-bulb globe temperature

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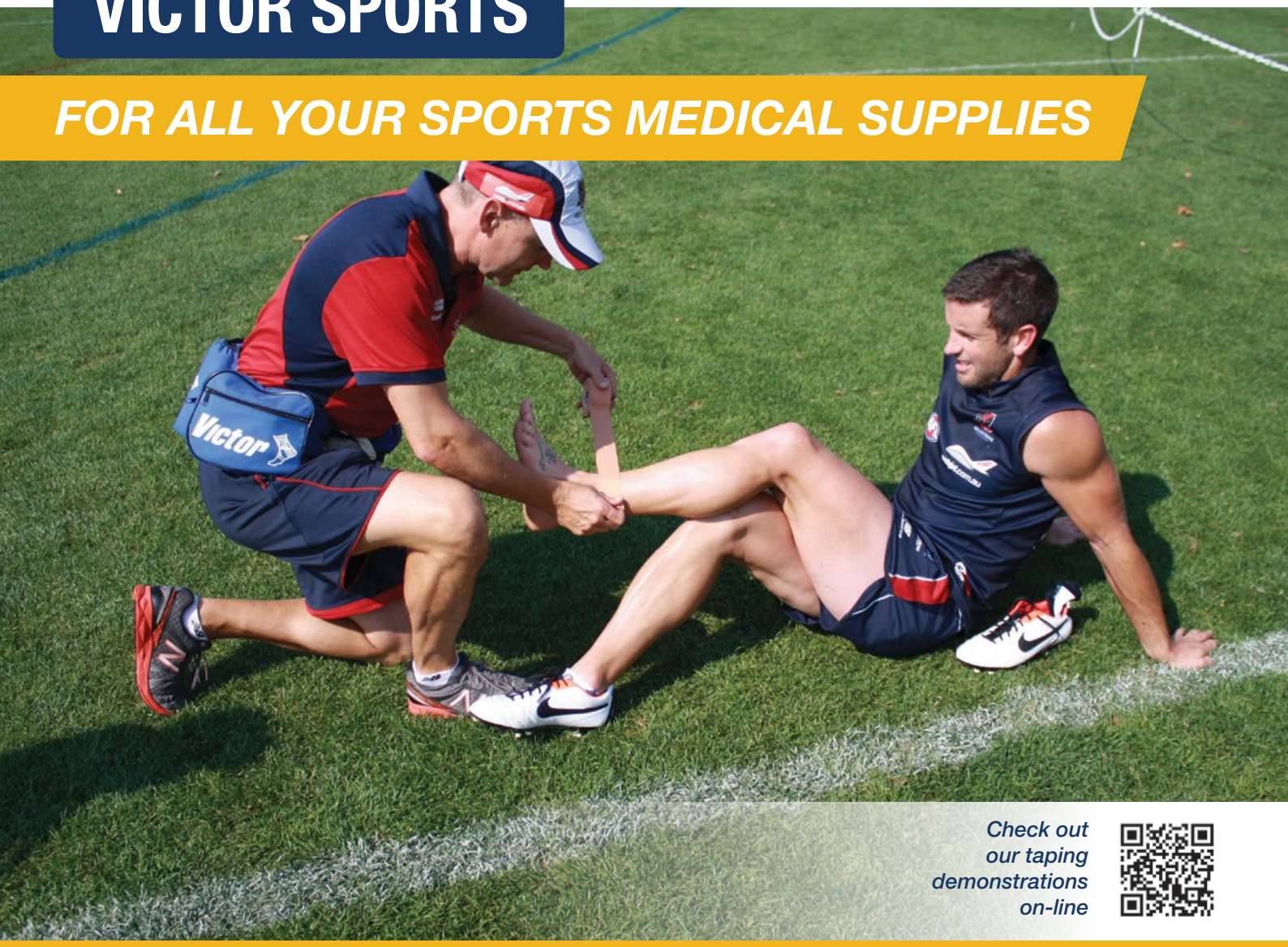

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SPORTS MEDICINE AUSTRALIA

Publisher
Sports Medicine Australia
PO Box 78 Mitchell ACT 2911
sma.org.au

ISSN No. 1032-5662
PP No. 226480/00028

Editor
Andre La Gerche

Managing Editor/Advertising Manager
Declan Boffa

Design/Typesetting
Perry Watson Design

Cover photograph
www.thinkstockphotos.com.au

Content photographs
Author supplied; www.thinkstockphotos.com.au

FROM THE
CHAIRMAN

WHEN THE UNEXPECTED HAPPENS

Andrew Jowett
drajowett@opsmc.com.au

SMA CHAIRMAN, ANDREW JOWETT OUTLINES HOW EMERGENCIES OF DIFFERENT SEVERITY CAN AFFECT SPORT AT ALL LEVELS.

Emergencies in sport can take many guises as we have seen in recent times and the defining feature is that they are fortunately uncommon. Many emergencies cannot be prevented despite our best attempts at risk minimization – some cannot be predicted. Emergency is defined as "a serious, unexpected and often dangerous situation requiring immediate attention." It is perhaps no surprise it sounds like "urgency"!

Take for example the Boston marathon – in 2012 organisers dealt with more than 100 runners who were hospitalized due to the heat. In 2013 organisers dealt with an emergency of a different kind, when a bomb went off, killing three and injuring 264. Heat in Boston in April is not predictable but then neither was a bomb. The fences around the MCG this summer remind us that such possibilities will sadly be a part of our modern sporting world.

Emergencies can also occur on an individual basis in much lower profile events and sport, and even daily life. Sadly there will be emergencies in sport on suburban grounds this weekend. No one wants to be there when it happens but I personally can thank the skills of my training, particularly through emergency courses for assisting a friend in a "one punch" incident last Christmas.

Sadly there will be emergencies in sport on suburban grounds this weekend.

What defines the outcome however is how we respond to the situation. Clearly planning, preparation and practice are the essential elements of successful emergency management. Let's include some other "P's" like personnel and a phone!

Emergencies demand leadership both in planning and also execution. Sports Medicine Australia has developed training and resources to enable and support its members as leaders in the management of sporting emergencies. We all need to assist in getting these to the community where they are needed to ensure our family, friends and community can continue to enjoy the positive sides of sport. Alert you club to the resources and be an advocate.

This issue addresses topics regarding emergencies in sport and provides further information to better prepare.

Finally, a piece of advice from Samuel Shem's bible for trainee doctors "The House of God". On an arrival at an arrest "first take your own pulse"!

PREPARING FOR THE WORST

FROM THE **CEO**

SMA CEO, ANTHONY MERRILEES ECHOES THE NEED FOR COMMUNITY SPORTING CLUBS TO HAVE A PLAN IN PLACE TO DEAL WITH AN EMERGENCY.

Anthony Merrilees
anthony.merrilees@sma.org.au

A report by the Australian Institute for Health and Welfare estimated that in 2011-12 more than 36,000 people over the age of 15 were hospitalised as a result of an injury sustained playing sport. Other studies have suggested that up to 150 people injured, will sustain an injury that would be classed as serious or catastrophic. Relative levels of participation indicate that most of these injuries are likely to happen at the community sports club level.

Community sporting clubs are often resource poor, and as a consequence emergency medical planning while important, may be a governance activity that is sometimes overlooked, as clubs grapple with more mundane issues such as the availability of equipment, acquiring the necessary number of volunteers or hiring trained and competent coaches. However, the statistics suggest that planning for an emergency situation may be more important than they realise.

Research tells us that the speed and effectiveness of a response to an injury event is a key factor in injury management, especially if the injury sustained is catastrophic. The required speed and effectiveness of a response is most likely to be enhanced in an environment where a club has developed and embedded a medical emergency plan.

Sports Medicine Australia recognised this need some time ago and has produced a Medical Emergence Planning Guide for community sporting clubs. The guide sets out a series of practical measures that a club can use to develop an effective plan, including the key considerations that a club will need to address when preparing such a plan.

In commending medical emergency planning and Sports Medicine Australia's guide, I am reminded of something that Benjamin Franklin once said which was, that "*by failing to prepare, you are preparing to fail*".

Research tells us that the speed and effectiveness of a response to an injury event is a key factor in injury management, especially if the injury sustained is catastrophic.

5 MINUTES WITH HUGH SEWARD

5 MINUTES WITH... HUGH SEWARD CHIEF EXECUTIVE OFFICER OF THE AFL DOCTORS ASSOCIATION

Tell me a little about your sports medicine background.

I commenced General Practice in Geelong in 1980 and began exploring sports medicine as a special interest. The discipline was in its fledgling days with a small number of doctors helping out with team sports. The major group of doctors with a sports medicine interest worked within the VFL in the days before the national AFL competition. Encouraged by an equally young Craig Purdam, who was then the Geelong Football Club's junior physiotherapist before moving to the AIS, I started working with the Cats and stayed with them for 25 years. Football medicine has been my major sport commitment, but I have also worked with a variety of other sports, including the Australian Tennis Open and at the Commonwealth Games.

What does a typical day for you consist of?

Each day of the week is different, but my typical week involves running my medical clinic and providing a now uncommon blend of Sports Physician and General Practice consulting. I spend a day a week in my role as the CEO of the AFL Doctors Association. I share my remaining time as a clinical consultant with Victoria's TAC and several not-for-profit boards, including the Geelong Cats.

What is your favourite aspect of your job?

Managing supportive relationships with my patients and achieving good outcomes for their myriad of medical problems.

What has been the highlight of your career?

The success of the AFL Doctors Association. Through injury surveillance, advocacy for rule changes, research and innovation, we have made a positive impact on Australian Football to the benefit of footballers and their injuries.

How did you become involved with SMA?

In my early years Kevin Threlfall, who was the Geelong Football Club doctor for many years, mentored me. He was active in the formation of the Australian Sports Medicine Federation (ASMF), SMA's predecessor. I joined the local Barwon branch of the ASMF in the early 1980's and organised several of the first national sports medicine symposia as the interest in sports medicine was growing in Australia.

What do you think the benefit of being a SMA member provides especially within the sports medicine field?

Connection and interaction with all disciplines in sports medicine is essential for everyone who treats elite and recreational sports participants. SMA is the organisation that fosters this collaboration.

Describe your role within the AFL Doctors Association.

Club doctors have been organised and active longer than any other stakeholder group in the AFL, outside of the clubs themselves. We play a role as advocates for the health and welfare of the players within the AFL. We support our members through emergency management training, further education, a sport specific annual conference, advice on contract negotiations and conflict resolution. We are supported by sponsorship arrangements, and not funded by the AFL, as we attempt to maintain a degree of independence within the AFL sphere. My role as CEO is to organize and facilitate these activities and liaise with the AFL and other stakeholders.

How did you come to be in this role?

I became President of the AFL Doctors Association in 1991 and stayed in the position until I retired from my role as a club doctor in 2007. The AFLDA had grown significantly in both its membership and activities during this period and the role of a part-time CEO was created to meet the expanding needs of the organisation. I have filled this role since its inception but will shortly retire from the position after 10 years. I will pass the baton on to a new CEO as the 2016 AFL season commences.

Besides from sports medicine, what are you passionate about?

I enjoy travel, wine and exercise, especially with company of family and friends.

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

Find a job that means you have to go to the footy each weekend!

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

Charles Brownlow – Premiership Captain of Geelong in 1886 (a little known fact) and landmark historical figure in the AFL. Australian Football's most prestigious individual award, the Brownlow Medal, is named in his honour.

Weary Dunlop – Courageous doctor, Australian Rugby Union representative, and legendary hero of the Burma Railway in World War II.

Barry Humphries – My favourite comedian and satirist, firstly of life in Melbourne, then Australia, now the world.

Queen Elizabeth II – One of the most influential leaders of my life time and we would have the dinner at her place!

FAVOURITES

Travel destination: Walking in Southern Tasmania

Sport to play/watch: Australian Football

Cuisine: Modern Australian fusion

Movie: Life of Brian

TV program: Game of Thrones

Music: Johann Pachelbel's Canon for Violin and Bass

Song: The Girl from Ipanema

Book: Geoffrey Blainey's Short History of the World

Gadget: Heart Rate Monitor, great for exercise and a nice reminder that you are alive.


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THE UNDERREPORTED THREAT OF CARDIAC ARRESTS

CARDIOLOGIST ANDRE LA GERCHE OUTLINES THE ALARMING FIGURES OF SUDDEN CARDIAC DEATHS IN ATHLETES AND THE NEED FOR GREATER AWARENESS.

THE UNDERREPORTED THREAT OF CARDIAC ARRESTS

Discussion about collapse and sudden death during exercise requires a degree of equipoise. Emphasis needs to be placed on the fact that sudden death, cardiac arrest and other serious events are extremely rare and many believe that this is where the discussion should stop.

The argument is that coverage of sudden death during sport acts as a deterrent to exercise when we are faced with an epidemic of morbidity associated with sedentary behaviour. There is no doubt that a majority of our community need to be encouraged to do more exercise but I would contend that sensible discussion, education and respect for the public's ability to digest complex issues provides a context in which medical professionals can lead the debate. Rather than reacting to sensationalist reports in the media or eye catching headlines such as the New York Times' "One running shoe in the grave" (27th November 2011) we should be leading education and discussion.

With this in mind, Sport Medicine Australia have compiled an excellent group of articles addressing some of the key causes of life-threatening illnesses at sports events. The death of young athletes is a tragedy, whatever the cause. Maron et al. assessed the incidence and cause of death in the American college athlete system and recorded a mortality rate of 4 per 100,000 athletes[1], broadly consistent with multiple similar epidemiological studies in athletes. However, the authors noted that deaths attributable to definite or presumed cardiovascular causes represented 35% of cases, a greater number than suicide or drugs combined and far greater than deaths attributable to motor vehicle accidents. These statistics would seem surprising when you consider the public campaigns aimed at reducing unexpected deaths in our community.

The Victorian Transport Accident Commission, for example, spends over $20 million per annum on media campaigns aimed at reducing the road toll and there are similar direct campaigns for suicide and harm minimisation for drug taking. It would be intriguing to know whether the community would be surprised to learn that sudden cardiac death is the most common cause of death amongst teenagers and younger adults. So why is the prevention of sudden cardiac death not part of popular debate? What are the issues for wider implementation of a strategy to reduce sudden cardiac death?

As nicely detailed by our expert contributors in this edition of Sport Health, the issues are complex. Dr Maria Brosnan discusses the causes of sudden cardiac death in young athletes and Dr David Bertovic tackles the rising middle aged (wo)man in lycra (MAMIL) demographic. In all ages it would be ideal if we could accurately identify athletes at risk with simple inexpensive tests and institute therapies or simple recommendations that would reduce risk. However, as these two cardiologists detail, there are considerable issues with specificity of tests resulting in false positives and resultant financial and psychological costs of further evaluations. Also, it is important to recognise that a significant proportion of sports-related deaths occur in people with no evidence of heart disease.

Heat related illness or 'heat stroke' is a very important cause of morbidity and mortality at sporting events. Some authors have reported that it is the single most common cause of death at fun run and marathon events[2]. In America, heat related illness is high on the agenda of scientific discussion and most marathon races have action plans for heat stroke in which core temperature is assessed urgently (usually using a rectal thermometer) and, if confirmed, athletes are submerged in an ice bath immediately. I recently visited Prof Aaron Baggish in the finishing tent of the Boston Marathon

In all ages it would be ideal if we could accurately identify athletes at risk with simple inexpensive tests and institute therapies or simple recommendations that would reduce risk.

THE UNDERREPORTED THREAT OF CARDIAC ARRESTS

Here in the sunburnt country, heat related illness is seldom considered and emergency treatment plans are inconsistent

and was intrigued to see scores of iced water baths lining both sides of a massive mobile medical facility.

Here in the sunburnt country, heat related illness is seldom considered and emergency treatment plans are inconsistent, at best. Associate Professor Grahame Budd addresses the limitations of assessing environmental risk for heat related illness, another important means of increasing risk stratification so that resources can be directed to races and athletes most at risk.

The most important article in this issue is that by Andrew White. Screening strategies are unproven and imperfect but early treatment is lifesaving. Andrew beautifully details the compelling rationale for community-wide implementation of early access to advanced life support and better educational campaigns that will enable more bystanders to feel comfortable operating automated external defibrillators. This is surely where the best "bang for the buck" lies and we should try and divert every opportunity for media engagement to the greater provision of community access defibrillators and funding of awareness campaigns.

Proper education with (1) emphasis on the low-risks and substantial benefits of exercise, and (2) explanation of effective strategies for the rare cases of sudden collapse/arrest is the right lead for us to take and will encourage rather than dissuade the public to exercise.

ABOUT THE AUTHOR

Andre La Gerche is head of Sports Cardiology at the Baker IDI Heart and Diabetes Institute in Melbourne. He has also done extensive research on cardiac health in athletes.

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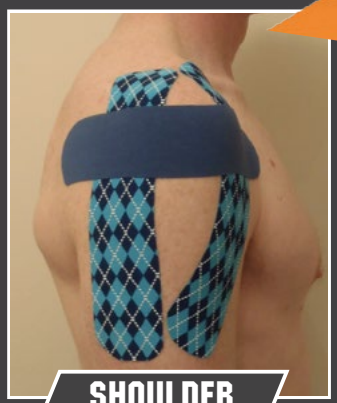

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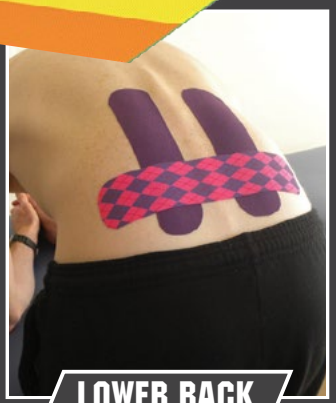

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THE NEED FOR **DEFIBRILLATORS** AT ALL **SPORTING CLUBS**

ANDREW WHITE OUTLINES THE SERIOUS EMERGENCIES THAT CAN OCCUR IN LOCAL SPORT AND HOW IMPORTANT DEFIBRILLATORS ARE FOR EVERY SPORTING CLUB AROUND AUSTRALIA.

THE NEED FOR **DEFIBRILLATORS**

Every year we see far too many Australians die as a result of sudden cardiac arrest (SCA) at sporting events. The key to saving lives rest essentially with the education of our greater sporting community and governing bodies to recognise the vital role that defibrillators and cardio pulmonary resuscitation (CPR) play in preventing premature deaths.

Many victims are in the prime of their lives, young, apparently fit and healthy and without warning they suddenly collapse due to the onset of a lethal cardiac arrhythmia. SCA is caused by a sudden disruption to the heart's electrical component, hypertrophic cardiomyopathy (HCM) being one of the leading causes along with blockage of the coronary arteries (heart attack). It does not discriminate and can affect all ages, gender and it's not just the competitors at risk, it can happen to officials and spectators alike.

Thankfully, victims of a cardiac arrest can be saved if early intervention is at hand. The key to survival ultimately depends upon how well bystanders react to this critical emergency.

There have been numerous studies aimed at developing a strategy for improving cardiac arrest outcomes. In 1992, the American Heart Association adopted *the Chain of Survival,* which was developed by Mary M Newman in 1988. The concept was recommended by the Australian Resuscitation Council shortly afterwards and is proven to dramatically increase patient survival outcomes following cardiac arrest.

The Chain of Survival recommends;

- Early bystander recognition of the event.
- Call 000 for immediate assistance.
- Commence CPR immediately.
- Locate and apply an automatic external defibrillator (AED) to the patient.
- Advanced life support is applied.
- Transport to hospital.

Many of the calls outs I attended during my 24-year career as a Mobile Intensive Care Paramedic were due to sudden

cardiac arrest. It soon became glaringly obvious that the *chain of survival* worked. Mostly the patients who survived did so because they had received early CPR and or early defibrillation.

In 2010, I felt compelled to establish the not for profit foundation *Defib for Life* following the death of more than 10 young athletes in Victoria alone that year. The common theme with each of these young patients was that they did not receive defibrillation within the crucial first 10 minutes of their collapse.

On further research, I discovered that Australia was falling behind other first world countries in regards to Public Access Defibrillator Programs (PADP), in particular at sporting venues. Even though many international sporting bodies already had either legislation or policy in place to mandate defibrillators, very few existed in Australia, apart from a few of the major venues that held regular international events like the Melbourne Cricket Ground and Rod Laver Arena.

A recent Ambulance Victoria study (2015) found that patients who suffered a cardiac arrest in a public place were 62% more likely to survive if a non-medical professional or bystander was the first person to defibrillate them. The key to improved outcomes relies heavily on being able to find people willing to help. With a 46% improvement in bystander initiated CPR over the last decade, the Ambulance Victoria statistics are so inspiring that other states and territory's must take note.

As a result of Ambulance Victoria's findings, combined with a growing number of lives being saved at sporting venues, the Victorian Government's Sport and Recreation department is intending to roll out 1,000 defibrillators across the state in early 2016. This program will see defibrillators and training packages awarded to grass roots community clubs. A program of this magnitude is the first of its kind in Australia and one that we hope to see replicated across all the States and Territories in the coming years.

Another precursor to the government's 1,000 Defib program was a movement by Defib For Life to educate the community on the importance of early defibrillation to save lives. To date, Defib For Life have successfully implemented over 2,500 defibrillators and have trained over 30,000 club members to react to a cardiac emergency. This program is now helping to save lives at sporting venues right across our country.

THE NEED FOR **DEFIBRILLATORS**

Many sporting clubs struggle for funding at the best of times and when first contacted, most feel that purchasing a defibrillator is well beyond their club's financial means. Equipped with this information, Defib For Life was able to develop numerous pathways to help raise funds for clubs to purchase defibrillators.

Partnerships were being forged between co-located clubs. Leagues, local sponsors and councils were collaborating to provide funds. A number of grants became available through sports and health departments and one of Australia's larger corporate banks recognised an opportunity to fund community defibrillators via its network of community friendly branches.

Having a rescue ready defibrillator and trained members who are able to provide essential support until professionals arrive, is not a luxury but a necessity.

It is time that legislation is written by governments to mandate defibrillators at sporting events and public venues. There are a number of leading sporting bodies and public organisations who have already recognised their obligation to provide safer facilities and have written occupational health and safety policies to ensure a defibrillator is present prior to the commencement of an event.

Tragically there will be further lives lost before government legislation succeeds. If your club can afford to install a defibrillator, I recommend you do so as soon as possible.

It is a simple concept. Defibrillators are safe and easy to use by laypersons and the more we have out there, the more lives will be saved.

ABOUT THE AUTHOR

Andrew White is the founder of *Defib for Life* with 24-years experience as a Victorian Mobile Intensive Care Paramedic. Andrew has presented as a keynote speaker and is an advocate for legislation to be mandated to include defibrillators at sports and other public venues across Australia.

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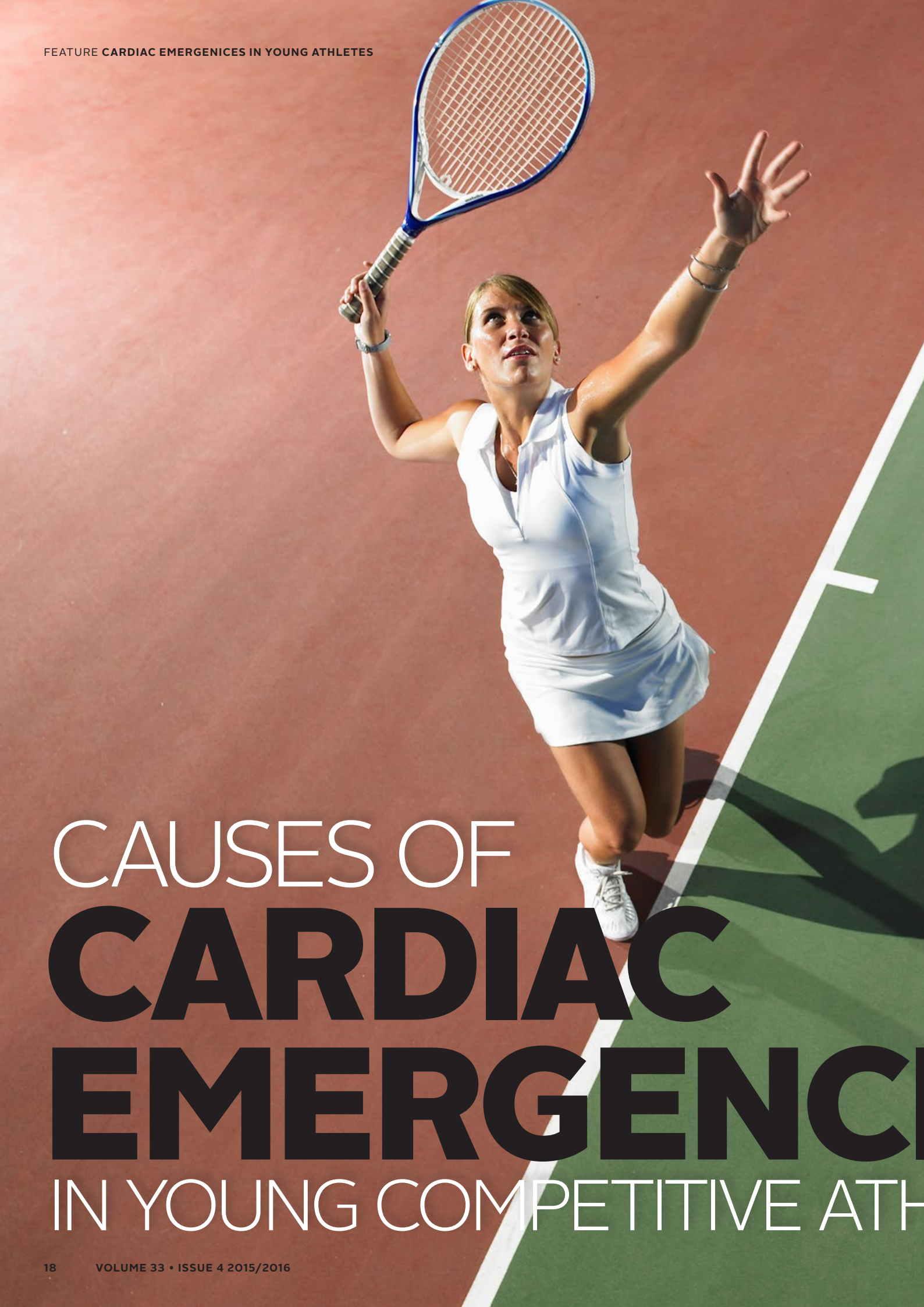

CAUSES OF CARDIAC EMERGENC IN YOUNG COMPETITIVE ATH

DR. MARIA BROSNAN PHD HIGHLIGHTS THE RARER, ALTHOUGH JUST AS SERIOUS CASE OF CARDIAC EMERGENCIES IN YOUNG ATHLETES UNDER THE AGE OF 35.

Cardiac emergencies in young (<35 year old) competitive athletes are rare, but when they occur, understandably raise concern and a sense of disbelief that a young person at the peak of physical fitness could have anything but a healthy heart. In young athletes, such events are often attributable to previously undiagnosed, genetically inherited diseases of either the heart muscle or its conduction system. In these individuals, exercise can act as a trigger for life threatening ventricular arrhythmias which lead to collapse, sudden cardiac arrest and in the absence of prompt and effective resuscitation, sudden cardiac death (SCD). Although rare, SCD is always a tragic event and efforts to prevent its occurrence are ongoing, with much focus on the utility of pre-participation screening to identify those subjects at increased risk.

INCIDENCE OF SPORTS RELATED SUDDEN CARDIAC ARREST IN YOUNG ATHLETES

Sports related SCD generally refers to resuscitated sudden cardiac arrest or SCD during or within one hour of sports activity. Around ¼ of cases of SCD in young athletes occur outside of the context of physical exertion, and these cases are generally excluded from statistics. The incidence of sports related SCD in young competitive athletes (YCAs) is incompletely understood. We know that it is more common in males, with an estimated male: female ratio of 10:1 to 20:1. The male preponderance is not entirely attributable to differences in sports participation rates or differences in the prevalence of cardiac pathologies, thus, it would seem that there are intrinsic factors rendering males more susceptible to SCD, but these remain poorly understood. Reliable estimates of SCD rates depend on accurate reporting of events and an estimation of the size of the population at risk. In the absence of specific databases, inaccuracies in these calculations are inevitable. Thus, the true incidence of SCD in YCAs is unknown, but is probably around 1/100,000 athletes per year in young (≤35 year old) Caucasian athletes and around four times higher in black African American athletes. In Australia, we rely on overseas estimates of SCD rates; however there is some evidence that the burden may be much higher in our indigenous athletic population, largely due to premature coronary artery disease.

CAUSES OF SPORTS RELATED SCD IN YOUNG ATHLETES

The most common autopsy proven causes of SCD in young athletes is outlined in Figure 1. Genetically inherited cardiomyopathies account for the majority of cases. In most reports, the single most common cause of SCD in this group is hypertrophic cardiomyopathy (HCM), which is characterised by abnormal thickening of the left ventricle in the absence of another explanation such as hypertension. It occurs in around 1 in 500 people and represents a broad spectrum of disease, with manifestations ranging from individuals with no symptoms during life to those who develop lethal arrhythmias and SCD. In Italy, arrhythmogenic right ventricular cardiomyopathy (ARVC) is reported to be the most common cause of SCD in young athletes, and it is possible that it has been under-recognised at autopsy in other centres. ARVC occurs in up to 1 in

The true incidence of SCD in YCAs is unknown, but is probably around 1/100,000 athletes per year in young (≤35 year old) Caucasian athletes and around four times higher in black African American athletes.

IES

HLETES

CAUSES OF **CARDIAC EMERGENCIES** IN YOUNG COMPETITIVE ATHLETES

2000 people and is characterised by fibrofatty replacement of the muscle of predominantly the right ventricle, but can also affect the left ventricle, or both. As in HCM, the spectrum of disease is broad, and life threatening ventricular arrhythmias and SCD may be the first symptom. Dilated cardiomyopathy (DCM) is a less frequently reported cause of sports related SCD in YCAs, possibly due to the incompatibility of ventricular dysfunction with high level sports activity.

Coronary pathology including coronary arteries arising from the wrong sinus origin, and premature coronary artery disease account for a further 10-20% of cases. Other less common causes include myocarditis, aortic dissection or rupture and valvular heart disease. Ethnic variations are evident, with HCM and coronary artery anomalies being more prevalent in black African-American athletes and premature coronary artery disease a specific consideration in young indigenous Australian athletes.

Although clearly associated with risk of life threatening arrhythmias, inherited disorders of cardiac conduction, or so called ion channelopathies such as long QT syndrome, catecholaminergic polymorphic VT (CPVT) and Brugada syndrome account for only a few percent of proven causes of SCD. In these conditions diagnosis must be made in life, as the heart will appear structurally normal at autopsy, as is the case in up to 25% of cases of YCAs with sports related SCD. Presumably a significant proportion of these represent cases of ion channelopathies. Others may represent missed diagnoses given post-mortem identification of the cause of SCD relies upon the experience of the pathologist and their familiarity with specific cardiac diseases.

CAN WE PICK THE FEW YOUNG COMPETITIVE ATHLETES AT RISK OF SERIOUS CARDIAC EVENTS BEFORE THEY OCCUR?

In the vast majority of YCAs who suffer SCD, fatal arrhythmia and cardiac arrest is the first clinical manifestation of an underlying cardiac disorder. Risk factors that may be identified prior include a family history of SCD or of inherited cardiac disorders associated with SCD. Symptoms that should raise red flags include unexplained syncope or a history of seizures, and chest pain or palpitations at rest or on exertion. Occasionally there may be abnormal findings on examination, such as a murmur.

Pre-participation screening (PPS) with history, examination and a 12-lead ECG is recommended or mandated in asymptomatic YCAs by a number of sporting bodies, largely as a result of a reported reduction in the incidence of SCD in the Veneto region of Italy after screening became mandatory. Despite some major flaws in the Italian report, in theory PPS with an ECG seems a rational proposal given that many athletes with conditions such as HCM have no symptoms, but may have ECG changes that could allow early detection. However there are several limitations to ECG screening that should be considered. The normal physiological cardiac adaptations to exercise are reflected in the ECG, resulting in a large number of abnormal ECGs in healthy athletes (false positives), particularly in those athletes undertaking the largest volume and intensity of exercise (elite endurance athletes). Athlete ECG interpretation criteria are being constantly refined in an effort to reduce false positives, however it is not known if this comes at the expense of reduced sensitivity (false negatives, or missed diagnoses). Diagnosis of conditions associated with SCD once an abnormal ECG has been noted is often not straightforward, as there can be significant overlap between the features of physiological adaptation to exercise, such as ventricular hypertrophy and dilatation and pathological conditions such as HCM and ARVC. Unfortunately, even once a diagnosis is made, risk stratification to identify those subjects at greatest risk of SCD is not an exact science, and the evidence that sports restriction actually saves lives in subjects with mild phenotypes of these conditions

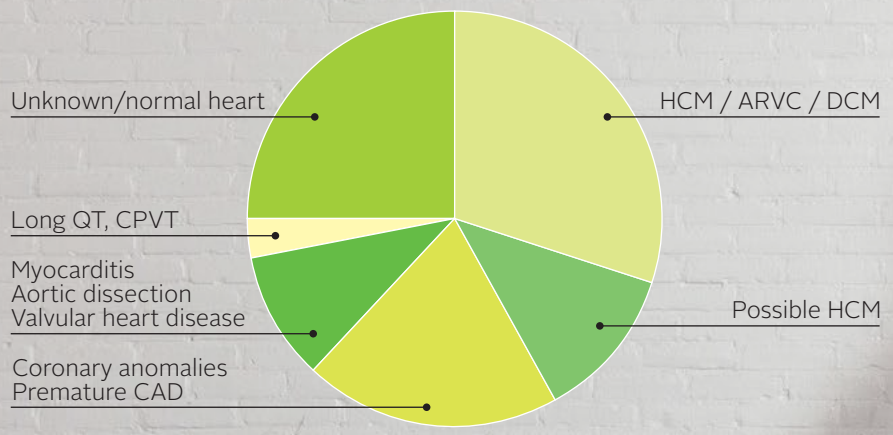

Figure 1. Autopsy proven causes of sudden cardiac death in young (<35 year old) competitive athletes.

Early defibrillation is a key to survival, and in an ideal world there would be easy access to AEDs at all sporting venues.

is currently lacking. Furthermore, reproducibility of ECG interpretation is poor, contributing to missed diagnoses (false negatives), another real limitation to the effectiveness of ECG screening which is often overlooked. In fact, most of the high profile athletes who have suffered a sudden cardiac arrest in the media spotlight in recent years have been screened multiple times, thus representing false negatives.

COULD BETTER MANAGEMENT OF CARDIAC EMERGENCIES SAVE LIVES?

Education of the general public, especially those involved in competitive sports, around recognition of sudden cardiac arrest, the basics of resuscitation and use of automatic external defibrillators (AEDs), would increase the survival rate in sudden cardiac arrest. Early defibrillation is a key to survival, and in an ideal world there would be easy access to AEDs at all sporting venues.

ABOUT THE AUTHOR

Dr Maria Brosnan PhD is a cardiologist at St Vincent's Hospital in Melbourne, Victoria. She is also a member of the Baker IDI Heart and Diabetes institute.

SMA MEMBER NEWS

JOURNAL OF SCIENCE AND MEDICINE IN SPORT (VOL 19 ISSUE 2 FEBRUARY 2016) HIGHLIGHTS

Journal of Science and Medicine in Sport (Vol 19 Issue 2 February 2016) highlights

- Sleep patterns and injury occurrence in elite Australian footballers
  J. Dennis, B. Dawson, J. Heasman, B. Rogalski, E. Robey
- Cardiorespiratory fitness and lung cancer risk: A prospective population-based cohort study
  P. P. Pletnikoff, T.-P. Tuomainen, J.A. Laukkanen, J. Kauhanen, R. Rauramaa, K. Ronkainen, S. Kurl
- Associations between organised sports participation and objectively measured physical activity, sedentary time and weight status in youth
  A. Marques, U, Ekelund, L.B. Sardinha

To access visit jsams.org

AAPSM/ASICS RESEARCH GRANTS

The Australian Academy of Podiatric Sports Medicine (AAPSM) is calling for grant applications from Australian research or public institutions. The AAPSM research grant is an initiative to promote and assist sports podiatry research in Australia. The purpose of the research grant is to provide financial support for sports podiatry research, as well as to encourage the dissemination and promotion of research findings within the sports medicine community. The deadline for all applications is Friday May 6th, 2016. To obtain a copy of the guidelines and an application form, visit the AAPSM website, the AAPSM Facebook page and Twitter page or email them directly admin@aapsm.org.au

SMA ONLINE STORE

Remember to visit the SMA online store. It has everything you need for first aid, including the full range of Victor sports taping equipment. **Click here to start shopping!**

SMA-ACT 2016 SYMPOSIUM – SILENT CONTRIBUTORS TO INJURY, ILLNESS AND PERFORMANCE

Sports Medicine ACT and the Australian Institute of Sport are proud to jointly host the 2016 Symposium "Silent Contributors to Injury, Illness and Performance" at the AIS facility in Canberra. The symposium is to be held on Friday 18 – Saturday 19 March. Registration is now open. The Symposium is limited to 250 registrations so be quick to register to avoid missing out.

Four sub-themes of the symposium have been chosen given their potential to both enhance and interrupt performance. These are Training Periodisation, Pathology, Medical and Body Composition/Sleep

The list of keynote speakers include:

- Professor Michael Kellmann
- Professor Per Aagaard – muscle morphology and muscle architecture induced by training and detraining/inactivity.
- Professor Malcolm Collins – molecular mechanisms causing common exercise-associated musculoskeletal soft tissue injuries.
- Dr Anna Melin – (Low) energy availability.
- Dr Paul Gastin – Assessment methods to quantify load and the monitoring of athlete responses to training and competition.

For further information or to register click here.

2016 SPORTS MEDICINE AUSTRALIA CONFERENCE KEY DATES

- Abstract submissions close April 13, 2016
- Preliminary program available June, 2016
- Early bird registration closes July 31, 2016

For more information visit sma.org.au/conference

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Join SMA now to be eligible for one of the ASMF Fellows awards. Conference awards are only available to SMA members. Joining fee of $40 waived for Conference delegates. SMA membership is open to anyone with an interest in or direct involvement with sports medicine, sports science, physical activity promotion or sports injury prevention and a minimum three year full time tertiary degree (or studying full time for a degree for student membership). The FOC student membership is an 'online access' membership only. For more information visit the membership page of the Sports Medicine Australia website.

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Conference Registration	Early Bird Registration On or before 31st July 2016	Late Registration On or after 1 August 2016	
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* One day registration includes entrance to the social program for the day that you are registered only.

Registered delegates receive access to all sessions being offered by the three conferences on their registered days only. Full registered delegates also receive lunch, morning and afternoon teas, tickets to the social program, entrance to the trade exhibition, a detailed Conference Program and a Conference satchel.

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A RENEWED CHALLENGE

THE FOLLOWING IS A REPUBLISHED EDITORIAL WHICH FEATURES IN ***THE JOURNAL OF SCIENCE AND MEDICINE IN SPORT*** (VOLUME 19, ISSUE 2, FEBRUARY 2016) WRITTEN BY EDITOR-IN-CHIEF, GORDON S. WADDINGTON, PHD.

This issue is my first as Editor-in-Chief of the *Journal of Science and Medicine in Sport* and my first task must be to thank the outgoing Editor-in-Chief, Professor Gregory Kolt for the tremendous job he has done over the last seven years with the Journal, ensuring that it has increased in the journal rankings and has not lost sight of its role in serving the broad membership of Sports Medicine Australia. The great news is that the Journal has not lost Gregory as he has agreed to continue as Consulting Editor and this will ensure that we have access to his excellent skills and knowledge as we continue to develop the vision for this next phase of the Journal's life. As we renew the challenge I would like to share with you my vision for the *Journal of Science and Medicine in Sport* to ensure that it will continue to effectively engage and expand its multidisciplinary readership in today's changing information technology environment.

As a consumer of the Journal, as a member and Fellow of Sports Medicine Australia, I have always held the journal in high regard especially for its ability to reflect the values of Sports Medicine Australia by maintaining a strong interdisciplinary relevance. However, a clear vision for the future of the *Journal of Science and Medicine in Sport* requires an understanding of what the Sports Medicine Australia members, as the "owners" of the Journal, want from their journal, balanced against the needs of other users on the world stage, the range of clinicians and scientists who use the journal to guide their practice and research directions. A clear vision for the future also needs to be constructed on an excellent understanding of the past.

The *Journal of Science and Medicine in Sport* has consistently performed well in the sports medicine and sports science journal rankings, rising in 2014 to 7th of the more than 80 journals in the JCR category of "Sports Sciences". This success is a strong positive reflection of the current Editorial Board's efforts to develop a journal of high relevance to its readership. This also means that a new editorial team needs thoughtful and clear priorities carefully identifying and nurturing the initiatives that have contributed to the current success of the Journal to maintain the positive direction.

The leadership team will need an ear to the ground to position the Journal in an ever-changing author and readership environment. For example, current moves away from using high quality journal

This also means that a new editorial team needs thoughtful and clear priorities carefully identifying and nurturing the initiatives that have contributed to the current success of the Journal to maintain the positive direction.

publication metrics to support government grant funding decisions, such as has occurred in the Netherlands, and is being considered in Australia, will impact on decisions authors make regarding submission of new articles. Similarly, access to information for practice, whether as a clinician or a scientist, will continue to rapidly evolve. In five years consumer interactions with the Journal will potentially be significantly different to interactions today, particularly as generational change in the readership brings online clinicians who expect rapid access to high quality distilled information on phone or tablet platforms.

And now to this month's Journal, in the sports and exercise medicine section, Pletnikoff and colleagues examine the relationship between cardiorespiratory fitness and lung cancer risk, Drew and colleagues evaluate MRI imaging in forearms of asymptomatic rowers, and Cai and coworkers add to the evidence base around the role of kinesiotape. In the sports injury section, Dennis and co-workers describe the effect of sleep patterns on injury incidence in Australian Rules footballers and Bayne and colleagues report a prospective study of lumbar load and injury rates in junior cricketers.

This issue's physical activity section has a strong focus on youth. Cattuzo's group reports a systematic review of motor competence and physical fitness in youth and Rebar and co-workers describe differences in the intention-behaviour gap between walking and vigorous exercise. Sutherland and colleagues outline the relationships between physical activity levels and lesson contexts in low income schools. Zitouni and Guinhouya report on the application of fuzzy logic in assessing physical activity in children and Marques and colleagues describe the relationship between sport participation, weight and physical activity in youth.

In the sports and exercise science section, Hirose and Seki describe the use of anthropometrics and motor ability indices as talent identification. Harries and co-workers report a comparison of resistance training techniques on strength in adolescent rugby players and Behrens and colleagues examine a number of aspects of plyometric training. Walker's group describe the application of inertial sensors in estimating energy expenditure in team sport athletes and Aughey and co-workers report the impact of internal load and strain on performance in Australian Football athletes. Cunhaand colleagues describe the effects of isocaloric cycling and running on post exercise oxygen consumption.

I commend to you this issue which continues to reflect the Journal's readership with an excellent mix of articles across the spectrum of science and medicine in sport.

ABOUT THE AUTHOR

Gordon S. Waddington is the Editor-in-Chief of The *Journal of Science and Medicine in Sport.*

The *Journal of Science and Medicine in Sport*, published by Sports Medicine Australia (SMA), is the major refereed research publication on sports science and medicine in Australia. The Journal provides high quality, original research papers to keep members and subscribers informed of developments in sports science and medicine. Produced for SMA six times a year by Elsevier Australia, it reflects SMA's commitment to encouraging world-class research within the industry, and its commitment to the continuing education of its members. Journal articles can be found at **jsams.org**

SPORT AND EXERCISE MEDICINE IN SOUTH AFRICA

THIS ARTICLE, WRITTEN BY DR PHATHOKUHLE ZONDI, DR JON PATRICIOS AND PROFESSOR CHRISTA JANSE VAN RENSBURG FORMS PART OF A SERIES PUBLISHED IN SPORT HEALTH TO LOOK AT THE STRENGTHS AND WEAKNESSES OF THE SPORT AND EXERCISE MEDICINE (SEM) SYSTEMS IN VARIOUS COUNTRIES, PROVIDING IDEAS AND INSPIRATION FOR ALL COUNTRIES ON HOW TO IMPROVE INFRASTRUCTURE IN THIS EMERGING SPECIALTY.

VIEW PAST ARTICLES HERE

VIEW PAST SPORT AND EXERCISE MEDICINE AROUND THE WORLD EDITORIAL HERE

As former president Mr Nelson Mandela once said, "Sport has the power to change the world". Sport was indeed a key contributor to the smooth political transition process in South Africa, and helped bring together our nation, dissipating tensions at a time when South Africans tethered on a tight rope of political and social uncertainty as the country braced itself for a new democracy and all it promised. Emerging victorious at the 1995 Rugby World Cup and 1996 African Cup of Nations (AFCON) were watershed moments in our country, in which all South Africans stood united, teeming with pride and patriotism that defied our recent history and inspired hope for the future. Ask any South African old enough to have experienced the euphoria of those times, and watch first as their eyes gloss over in recollection, and then a faint smile and warmth spreads across their face.

That may have been what sport meant to us then, but fast forward 20 years and the landscape of sport has changed dramatically in South Africa. Indeed sport still embodies hope for many South Africans; representing unity, inclusivity, our potential as a country, and for some an opportunity to escape depressing realities and strive for a better life. Significantly, however, sport is no longer something only a select few benefit from, something the majority watches from the sideline or from the comfort of their couches. In 2015, driven by strong political will and public-private partnerships, sport has become a tool accessible to all South Africans to varying degrees. Multiple industries have been built as sport has developed in South Africa, with sports medicine standing out as one such field. If sports medicine internationally was a marathon, South Africa may have been poorly seeded in 1994, but 20 years later employing tactics learned from our peers and strategies brewed at home, we strive to bump shoulders with our international counterparts and become stronger contenders as the race progresses.

EXERCISE SCIENCE AND SPORTS MEDICINE AT A GLANCE

The sports health industry in South Africa comprises of sports and exercise medicine (SEM) physicians working in partnership with a strong contingent of exercise scientists, physiologists, biokineticists (post-graduate qualified exercise rehabilitation specialists), physiotherapists, dieticians, psychologists, podiatrists, and chiropractors. South Africa has 23 parastatal tertiary institutions, nine of which have courses in biokinetics, eight of which offer courses in physiotherapy and only four of which offer post graduate qualifications in SEM. The industry is bolstered by the auxiliary professions both in terms of numbers and contribution to research and scientific practice employed in the country. Most of these practitioners are concentrated in urban and peri-urban areas, with physiotherapists, perhaps, being the only profession represented in the rural areas of South Africa. This distribution of resources is hardly surprising as most of the clientele who currently make use of sports and exercise medicine services are concentrated in urban and peri-urban South Africa.

The South African Sports Medicine Association (SASMA) is a multidisciplinary professional and scientific body whose objective is to promote SEM to the benefit of the South African community. Specifically, SASMA is involved with[1]:

- Facilitating growth and networking of SEM practitioners through regular regional and national CEM meetings.
- Implementing educational programs for members, coaches, athletes and the general public.
- Publication of a journal (the South African Journal of Sports Medicine) and other educational material, as well as social media interaction such as a website, Facebook page and Twitter handle (@sasmadiscuss).

SASMA is seen as the umbrella body of SEM in South Africa, and works closely with other similar interest groups both locally and internationally.

INJURY PREVENTION AND REHABILITATION

Participation in Sport

Soccer, rugby and cricket are the most commonly played sports in South Africa.[2] Beyond the country's big three, sports such as athletics (specifically road running), aquatic sport, cycling, hockey, golf, surfing, netball and boxing are also popular amongst both recreational and high performance athletes. The pattern of participation in sport is determined both by accessibility to facilities and the demographic profile of participants.

Injury Profiles

The location of one's practice directly influences the types of injuries seen by clinicians. For example, those clinicians that work at tertiary institutions will most likely see injuries associated with sporting codes offered at those institutions, while clinicians in private practice will most likely see injuries sustained by recreational athletes (most commonly runners and cyclists) or school-going athletes from nearby schools (rugby, soccer, cricket, swimming, netball).

An informal survey completed by sports medicine practitioners in private practice (contributors to this article) revealed the following injury patterns in private practice.

Sport	Injury
Distance Running	Tendinopathies, muscle strains, bone stress injuries, medical conditions
Cycling and Mountain Biking	Head and shoulder trauma, knee injuries
Rugby	Musculoskeletal trauma, concussion
Soccer	Lower limb injuries (contusions muscle strains, sprained ligaments), tendinopathies

Table 1: Injury patterns commonly seen in private practice

SPORT AND EXERCISE MEDICINE IN SOUTH AFRICA

Rehabilitation

The majority of South African sports medicine practitioners work in multidisciplinary teams. These teams are either housed in one building in the form of a "sports medicine clinic", or may exist more informally in the form of a firmly established network of specialists to whom practitioners refer patients. In the multidisciplinary team, the rehab "specialists" consists of physiotherapists for acute injury management, and biokineticists for end-stage rehabilitation.

In most instances in private health care, the clinician in first contact with an athlete is a physiotherapist, a general practitioner or a sports physician. When seen by a physiotherapist, the athlete will often be managed by that clinician until full recovery, unless a referral to a doctor needs to be made for special investigations. When first seen by a physician, the athlete is investigated and managed and referred to an appropriate service provider should further management be required, following up at pre-determined intervals with the primary practitioner.

In general, athletes seen at multidisciplinary "sports clinics" are more likely to receive a multidisciplinary approach to rehabilitation compared to those seen by practitioners who practice in isolation. For example, at tertiary institutions such at the University of Pretoria in Gauteng and Stellenbosch University in the Western Cape, athletes are treated in a multidisciplinary injury clinic that compromises of general practitioners, sports physicians, physiotherapists, massage therapists and biokineticists. Both these institutions also have a High Performance Unit that includes sports scientists, nutritionists, physiologists and psychologists whose primary focus is the high performance athletes, and secondary focus is recreational athletes.

Figure 2 shows the Injury Protocol at the University of Pretoria. The simplified flow chart illustrates the movement of the athlete from one practitioner to the next during the rehabilitation process. It is important to note that the athlete is seen by the attending physician at routine intervals throughout the rehabilitation process.

Affordability of Treatment

First aid treatment at sports events is arranged and funded by the event organiser and offered free-of-charge to participating athletes. Any further management and referral is for the account of the athlete or team.

The off-field sports medicine facilities described above are currently only offered in private health care which services approximately 28-35% of South Africa's population.[3, 4] Patients using public health care are managed at a clinic by general practitioners and nurses, or referred to physiotherapy or orthopaedics as required. The reality, however, is that health care workers in public clinics have a limited knowledge of sports injuries and, as such, many patients are under-treated, with consequences that often affect sports performance. Although the level of skill and knowledge improves in secondary and tertiary centres which have physiotherapy or orthopaedic departments, inefficiencies in the referral system often result in patients only being seen by these specialists six weeks to three months after sustaining an injury.

Seventeen percent of the population benefits from access to private health care via insurance companies, with out-of-pocket expenditure accounting for the remaining 18% of users.[4] Medical treatment for recreational athletes is usually self-funded (either insurance companies or cash) while medical care for professional athletes is often club funded or in a select few, funded by the National Olympic Committee.

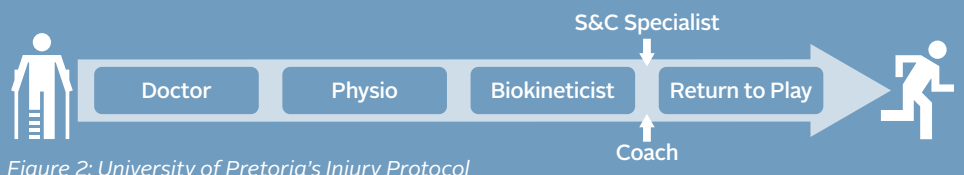


Figure 2: University of Pretoria's Injury Protocol

THE ROLE OF ANTI-DOPING AND DRUG-FREE SPORT

The South African Institute for Drug-Free Sport (SAIDS) spearheads the anti-doping movement in South Africa. Since the agency's inception in 1998, they have led the development of a national anti-doping strategy and implemented a comprehensive drug testing programme for all major sporting codes in South Africa, conforming to the highest international standards. They provide anti-doping education to the public and to all personnel in sport, and also consult to other African countries on capacity building in the continent.[5]

Practitioners involved in sports on a regular basis profess that South Africa's anti-doping methods meet the highest standards at a professional level, but concede that these efforts seem to fall short at amateur, club and school level. Understandably, SAIDS has chosen to prioritise professional sports, and although they do exercise some muscle at an amateur level, their efforts seem to be thwarted by the lure of quick fix remedies that are easily accessible in malls, or readily offered by a few rogue practitioners. This is a global challenge and certainly not unique to South Africa. Nonetheless, SAIDS is determined to strengthen their influence at all levels, and in 2014 launched a high-school anti-doping and drug education campaign. This was in response to recurrent anecdotal and scientific evidence of an increasing use of anabolic steroids at South African schools for both performance and image enhancement.

THE FUTURE OF SPORTS MEDICINE IN SOUTH AFRICA

Scope for improvement

As with any high performance team, stakeholders in the field are constantly seeking ways to improve on the strengths of industry and simultaneously minimize its shortfalls.

Highlighted in the South African Sports Ministry's National Development Plan is the goal to increase mass participation and accelerate development in sport.[6] Ideally this mandate should be strongly aligned with a goal to improve access to sports medical facilities in both the public and private sector as accessibility to and affordability of special investigations and specialist consultations remain a challenge in both sectors. In the Department of Health's 2013 Annual Report, the Minister of Health

acknowledged the "exploding prevalence of non-communicable diseases" and the role of lifestyle interventions in the prevention and management of these diseases.[7] There are no specialists to manage this pandemic in our public health care system, and SEM practitioners are ideally skilled to fill this gap. An academic committee has been established to address this and has made significant progress in its application to institute SEM as a specialty in South Africa. The ultimate goal is to improve training infrastructure and government SEM services, goals which tie in with broader health initiatives of both the Department of Health and the Department of Sport and Recreation.

Always open to acknowledge where we can improve, South Africa's SEM practitioners also welcome the opportunity to showcase our policy and research achievements. The University of Cape Town is one of four IOC Research Centres worldwide, and continues to produce high impact research that has influenced clinical practice and improved athlete safety. South Africa also has two FIFA accredited research facilities (University of Cape Town and University of Witwatersrand), centres recognized for their contribution to football-related research. We also boast three universities that are International Federation of Sports Medicine (FIMS) accredited centres collaborating with their international counterparts in education and research initiatives.

South Africa is internationally recognised for its contribution to rugby research pioneering concussion programmes such as the BokSmart programme, which has been presented on numerous occasions internationally and has been replicated in various forms in a number of countries.

In the past two years, university sports has seen a significant boost in participation, professionalism and media coverage, providing a development platform that allows athletes to compete at a semi-professional level while continuing with studies. The sports medical support services at these events are equal to the best in the country.

Our unique challenge as African SEM practitioners is producing world-class athletes in the face of significant resource constraints, other third world and life threatening medical conditions such as HIV and TB, and environmental challenges such as extreme heat, high altitude, travel illnesses and infectious diseases. Our circumstances inspire creativity as one constantly juggles different treatment options, their relative costs, and their comparative efficacies. We pride ourselves in our ability to find simple solutions to complex challenges.
We pride ourselves in the sports facilities in Potchefstroom, Pretoria, Stellenbosch and Durban, which attract a multitude of international athletes capitalizing on our climate during their winter seasons. We pride ourselves in our progress as an industry and the significant strides we have taken to establish ourselves in the international fraternity.

The Break-Away Lap

2015 was a significant year for South Africa's big three sports. Although we bowed out in the group stages of the AFCON Cup, we remained inspired and produced noteworthy performances in the Cricket World Cup and later, in the Rugby World Cup, both ending in third place finishes. All throughout we donned our makarapas, dusted off the vuvuzelas and continued to wave our flag proudly in support of our boys!

As for the SEM practitioners, we continue to tussle to be part of the lead pack, focused and headstrong. Those in the race, through SASMA, are now strategically focusing on handing over the baton to the next generation of SEM practitioners now ready to lead the pack as we progress to the next phase of SEM internationally. In Africa, we believe in the strength of unity and collaboration. And so, we aim to keep with the pack as SEM advances internationally acknowledging that we will all take turns in the lead but ever cognisant of the African proverb, 'If you want to go fast, go alone. If you want to go far, go together."

ABOUT THE AUTHORS

Dr Phathokuhle Zondi and **Professor Christa Janse van Rensburg** are from the University of Pretoria.
Dr Jon Patricios is from the Morningside Sports Medicine Clinic.

VIEW REFERENCES HERE

THE COUNTDOWN TO RIO

SPORT HEALTH CONTINUES ITS SERIES OF ARTICLES CHATTING TO SPORTS MEDICINE PROFESSIONALS IN THE LEAD UP TO THE 2016 RIO DE JANEIRO OLYMPIC GAMES. THIS ISSUE FOCUSES ON PETER WELLS, THE HEAD OF PHYSICAL THERAPIES FOR THE AUSTRALIAN OLYMPIC TEAM HEADQUARTERS CLINIC.

It is hard to believe that I am preparing to be the Head of Physical Therapies for the Australian Olympic Team Headquarters Clinic at the 2016 Olympics.

My physiotherapy journey began 30 years ago while I was still at school. Sport was a huge part of my life and sports physiotherapists were just starting to gain some credibility and media exposure due to their increasing involvement with high level sports teams. Being a reasonably talented sportsman, but never talented enough to make a career out of it, I wanted to be involved with sport as a professional. Physiotherapy seemed like a perfect option. I am a bit of a sports fanatic and I always knew I wanted to be a sports physiotherapist and work with elite level athletes but I didn't think it would take me down the path that it has!

I wanted to be working with the high level teams but thought it would have been in one of our football codes. Then my career took an unexpected turn when I started to work in a clinic with Roger Fitzgerald

and Louise O'Connor. These fabulous physio's had been working with the Australian swim team for 10 years before I arrived. I wasn't interested in swimming at that time but I began to become interested in the swimming athletes that I saw as patients in the clinic. I got interested in how they performed and gradually saw more and more swimmers and began to appreciate and love the sport. Roger and Louise were unwitting mentors to me over the next few years and eventually I was selected on my first Australian Swim Team in 2001.

Swimming and working with swimmers then became my passion. I worked hard and was lucky enough to travel the world with the Australian Swimming Team as Head Physiotherapist through five world championships, Commonwealth Games, Pan Pacific Championships and then the 2008 Beijing and 2012 London Olympic Games.

As a result of those experiences, I was invited to apply for the position as Head of Physical Therapies at the Headquarters Clinic for the 2016 Rio Olympics. Feeling flattered to be asked to apply, certainly not expecting to be successful but thinking it would be an interesting process to experience, I flew to the Australian Institute of Sport for an interview in September 2014. I was amazed to be offered the position and was officially appointed three weeks later.

The first step in the role was speaking at length with the Head Physio in the London 2012 headquarters (HQ), Wendy Braybon, about her experiences and advice. I was then invited to assist the AOC Medical Commission with the selection process of the 2016 HQ physiotherapy and massage therapy staff positions. A deputy Head of Physiotherapy, Head of Soft Tissue Therapy, five Sports Physiotherapists and seven Soft Tissue Therapists were selected and appointed by June of 2015.

Various organisational and management processes have continued since. Meetings with AOC and Australian Sports Commission staff, the Olympic Team Medical Director David Hughes, e-mails and phone calls for regular updates and planning are increasingly frequent as we rapidly draw closer to the Rio Games. Regular and timely communication is the key.

The role of the Olympic team HQ clinic is to assist and support the entire Australian Olympic team but especially the smaller sports that do not have their own physio/massage/medical staff travelling with them. The bigger team sports (e.g. Swimming, athletics, rowing, cycling) will have their own appointed and accredited support staff. HQ will assist them if necessary (e.g. If one of their staff becomes unwell and unable to work) but our focus will tend more towards the smaller sports like archery, shooting, weightlifting, tennis, golf, table tennis, badminton, the combat sports (boxing, Judo, Taekwondo), diving, synchronised swimming etc.

The HQ clinic will operate from 7am until about 10pm every day of the Games and for 10 days before they start – approx. 3.5 weeks overall. Therapists will work 10 hour shifts and we may have to be covering competition that starts at 10pm!

My role during the Rio Olympics will be to manage the HQ clinic and two other satellite clinic sites; I will also have a significant clinical treatment role. My job is to ensure that HQ provides an exceptionally high quality of service for the whole time that we are operational. There will be daily meetings with the Medical Director and the therapy staff to continually review and plan. Rostering will be a challenge – we will need to be very flexible and mobile as plans will invariably change from day-to-day as the various competitions unfold.

Our working conditions will be challenging. Building plans suggest that there will be limited space available. We will be spread across sports in three or four different competition zones throughout the games. Each day will bring new and unexpected challenges but with the quality of the therapy team that has been assembled, we will work out ways to deal with them.

Our biggest challenge is from within – working long days, getting tired but still maintaining consistently high standards is tough. One of the most important roles for the HQ team is to create and provide a sanctuary – a haven for the athletes to visit to not only get their aches and pains assessed and treated – it becomes a place to escape the pressures of being at the Olympic Games. There are many highs and lows everywhere at the Olympic Games – the emotions extreme. The HQ clinic is a place that athletes can come and know what to expect, friendly, efficient, professional and relaxed high quality service. A steadying and grounding influence.

There are many things that I am looking forward to in Rio:

I am looking forward to visiting Rio (and South America) for the first time. I look forward to experiencing the Olympics from a different perspective – not being attached to one particular sport. I look forward to working with some fantastic sports medicine and allied health professionals in the Australian Olympic Team. Being able to learn from these extraordinary professional is a priceless experience. I look forward to the hard work and the long days and at the end of the games – to experiencing the feeling of our HQ team having done a really good job!

There is no other place like the Olympic Games. It is sports physiotherapy's Disneyland! I am so privileged to be going again!

ABOUT THE AUTHOR

Peter Wells was the Head Physiotherapist for the Australian Swimming Team at the two previous Olympic Games in Beijing and London. Peter will take up the role of Head of Physical Therapies for the Australian Olympic Team Headquarters Clinic in Rio.

THE TROUBLE

DOES IT STILL

E WITH WBGT HAVE A PLACE IN SPORT?

GRAHAME BUDD, MD FRACP, DETAILS THE HISTORY OF THE WET-BULB GLOBE TEMPERATURE AND ASKS WHETHER IT'S STILL RELEVANT WHEN MEASURING THE DANGERS OF HOT WEATHER IN SPORT.

Does the Wet-bulb Globe Temperature (WBGT) index of heat stress, as presently used and misused, really help to protect sports people from heat illness? It is meant to express, in a single number, the combined effect on humans of all four elements of the thermal environment – air temperature, radiant heat, absolute humidity and wind speed – and thus to provide useful guidance about the risks of training and competing in hot weather. But the index is flawed – it underestimates the additional strain people experience in hot conditions when the evaporation of sweat is restricted by high humidity or low wind speed. And its accuracy has been eroded – by the use of non-standard instruments, by potentially inaccurate calibration methods, by the omission of globe temperature, and by the misnaming of inferior indices as 'WBGT'. The aim of this article is to outline the above problems, drawing mainly on three detailed earlier accounts of the subject[1, 2, 3].

A BRIEF HISTORY OF WBGT

WBGT was invented during the 1950s as part of a successful campaign to prevent heat casualties during military training in the USA[4, 3]. WBGT replaced an earlier measure of environmental warmth based on air temperature and humidity because it also took account of sun and wind, which if ignored could cause errors of more than WBGT 5°C[4]. Who has not felt the punishing impact of sunlight on a hot day, or the blessed relief of a breeze? Trainees' physical activity and exposure to sunlight were curtailed whenever certain limits of WBGT were reached. The limits were soundly based on epidemiological analyses of casualty records, which had identified vulnerable trainees and hazardous levels of heat. The introduction of WBGT, together

THE TROUBLE WITH WBGT

DOES IT STILL HAVE A PLACE IN SPORT?

with important measures to protect the vulnerable trainees, substantially reduced heat casualties. These convincing results soon led to the general adoption of the new measures, including the use of WBGT, by the US Marine Corps[5], and subsequently by military and civilian agencies worldwide. Over time, however, the index's major shortcoming has become apparent, and its usefulness has been eroded by inaccurate measurement techniques.

UNDERESTIMATION OF THE STRESS OF RESTRICTED EVAPORATION

As environments become warmer, or work more strenuous, humans become increasingly dependent on cooling by the evaporation of sweat, and thus increasingly vulnerable to anything that will restrict evaporation – specifically clothing, high humidity, or low wind speed. A major shortcoming of WBGT is that it fails to reflect this increasing vulnerability[6].

For example, laboratory tests showed that the physiological and subjective strains of exercising men were much greater when evaporation was restricted, by a combination of high humidity and low wind speed, than they were in conditions of free evaporation (low humidity and high wind speed) at the same level of WBGT[6]. The authors concluded that "WBGT, therefore, has limited value as a predictor of physiological strain at the higher heat stress levels which may be encountered in industry", and they suggested establishing two sets of WBGT limit levels, one for humid conditions and the other for dry.

The extreme stress of a low wind speed in hot and humid conditions has been demonstrated in the laboratory and in the workplace: laboratory studies[7] revealed an exponential increase in heat stress as wind speed fell from 2 m/s to zero, and the incidence of heat exhaustion in a hot mine increased steeply at the same low wind speeds[8]. WBGT's inadequate response to such conditions was highlighted by another laboratory study: men exercising in hot and humid conditions became incapacitated when wind speed was reduced from 0.8 m/s to 0.1 m/s [9], but the trivial increase in WBGT, from 37.4 to 37.6°C, gave no warning of this disabling increase in heat stress.

In recognition of this shortcoming of WBGT, a Standards Advisory Committee in the USA[10] recommended establishing two sets of WBGT limit levels – not for

humid and dry conditions but for wind speeds above and below 300 ft/min (1.6 m/s), the limits differing by almost 3°C. Both proposals confirm WBGT's failure to reflect the strain caused by restricted evaporation, which tends to disable the body's only means of dissipating heat in hot conditions.

In sharp contrast, conditions of free evaporation allow large heat loads to be dissipated without undue strain, provided that the required amount of sweat can be secreted. For example, the heart rates and rectal temperatures of lightly-clothed men suppressing Australian summer bushfires with hand tools were not changed by variations of 15-34°C in WBGT – 9°C above the recommended limit – nor by variations of 36-217 min in work duration, which showed that the men were always in thermal equilibrium[2, 11, 12]. These remarkable findings were explained by the firefighters' behavioural responses and the unrestricted evaporation of 504-2139 (mean 1144) g/h of sweat. Free evaporation was greatly enhanced by the increased air movement over the body and within the clothing that accompanied such vigorous physical activity. Similar considerations would no doubt apply in many sporting activities.

EROSION OF ACCURACY

Non-standard instruments – 'WBGT meters' and 'Heat stress meters'

WBGT has become the most widely used index of heat stress because it responds to sun and wind and is easy to measure. Its standard instrumentation could hardly be simpler or cheaper – three thermometers and a 15 cm black globe, which is easily made from the float of a toilet cistern. Detailed specifications, on which all applications of the index are based, are provided in the international standard ISO 7243:1989[13].

However, many users today favour small electronic instruments which are marketed as 'WBGT meters' or 'Heat stress meters'. Their globe and natural wet bulb sensors are smaller than their standard counterparts and hence yield different readings[14, 15], and their air temperature sensors are often inadequately shielded from radiant heat, so that in sunlight they overestimate air temperature. They incorporate software intended to compensate for these differences, but how successfully it does so needs to be established by calibration against the standard WBGT. This is no easy task.

Potentially inaccurate calibrations

The ISO 7243 standard states that non-standard instruments may be used if, after calibration, they give identical results to the standard WBGT. Unfortunately it does not specify the environmental conditions in which they are to be calibrated – a crucial omission, because agreement between a 'heat stress meter' and the standard WBGT in one set of environmental conditions does not guarantee they will agree in other conditions.

This awkward fact was impressively demonstrated when one such meter was calibrated against standard WBGT in air temperatures ranging from 17 to 43°C [16]. The predicted WBGT was found to be different for each combination of high and low levels of radiant heat, humidity, and wind speed – a meter reading of 28.5°C predicted values of standard WBGT ranging from 30.0 to 36.5°C. Comparable errors might well be present but undetected in other 'heat stress meters', since few manufacturers are likely to have undertaken such arduous calibrations. Yet the errors are important – they could inadvertently permit strenuous sports to continue in dangerously hot conditions, or to be unnecessarily curtailed in safe conditions.

Omission of globe temperature, and the misnaming of inferior indices

Despite the successful use of globe temperature in a wide range of investigations for more than 80 years, there have been many proposals to omit its measurement, and instead to estimate a misnamed 'WBGT' from air temperature and humidity alone – in effect a giant leap backward, to the inadequate temperature-humidity combinations that were superseded by WBGT in 1956[17, 3]. Unfortunately, many of these 'globe free' combinations have wrongly retained the name 'WBGT', causing confusion in the literature and also on the sports field. By definition, WBGT requires the measurement of globe temperature. Indices of heat stress that omit it should never be referred to as 'WBGT'.

Conclusion – is it time to move on from WBGT?

In view of WBGT's major shortcoming and the prevalence of inaccurate measurement techniques, might it be time to move on to a more valid and informative assessment of the risks of training and competing in hot weather? This could be done by routinely measuring the four primary elements of the thermal environment – air temperature, mean radiant temperature, absolute humidity, and wind speed[14, 1]. They are easily measured by a single observer, using simple and inexpensive instruments and long-established procedures. Figure 1 shows a scientist measuring the thermal environment experienced by a first-attack hand-tool crew suppressing an Australian summer bushfire[11] – a task in which the firefighters perform sustained strenuous work in hot conditions, just as competitors do in many outdoor sports.

From these simple observations, together with informed estimates of metabolic rate and clothing insulation, a computer calculates several indices of heat stress (including the standard WBGT), as well as invaluable estimates of the evaporative cooling required (Ereq) to maintain thermal equilibrium, the maximum evaporation possible (Emax) in the given environment, and the ratio Ereq/Emax (%), which reflects the degree of heat stress and the likelihood of achieving thermal equilibrium[1]. Ereq also provides an estimate of water requirements. Importantly, by making these calculations with information from weather forecasts, one can also assess the likely thermal hazards in advance of a scheduled sports event.

Figure 1. Scientist measures thermal environment on the fireline of an Australian summer bushfire[11]. Shielded cable runs from instruments on tripod to data logger in bag on ground. [Photo: Grahame Budd]

ABOUT THE AUTHOR

Grahame Budd, MD FRACP, is Honorary Associate Professor in Environmental Health in the University of Sydney.

VIEW REFERENCES HERE

ACUTE CARDIAC EVENTS

IN MIDDLE- AND OLDER-AGED ATHLETES

DAVID BERTOVIC DISCUSSES THE PREVALENCE OF CARDIAC EVENTS IN OLDER ATHLETES, THE VARIOUS CAUSES OF THESE EVENTS AND METHODS TO PREVENT THREATS IN ADVANCED.

Without doubt, regular physical activity confers significant health benefits, with a markedly reduced rate of cardiovascular disease seen in active individuals when compared to their sedentary counterparts. This is despite evidence illustrating that the risk of an acute cardiac event is greatly heightened during an intensive bout of exercise.

Without having access to quality data, many cardiologists and emergency medicine specialists believe that the incidence of major adverse cardiac events associated with athletic activity is on the increase in Australia, and this may be associated with the increased popularity of both competitive and non-competitive endurance events, such as open water swims, long distance triathlons, marathon and ultra-marathon running and mass participation cycling events. The number of these types of events in this country has increased over the last number of years, as the fitness industry and event promoters gain experience in the marketing of these events to previously sedentary individuals, as well as, on the whole, choosing to refrain from placing strict qualification criteria upon individuals wishing to undertake such activities.

The causes of sudden cardiac death in young athletes is discussed elsewhere, but this article will focus on acute cardiac events in older athletes, conventionally defined as greater than 35 years of age, covering the incidence and aetiologies of these events as well as discussing the controversial topic of cardiac screening in older competitive and recreational athletes.

PREVALENCE OF CARDIAC ARREST

Determining the incidence of cardiac arrest and sudden death during athletic activity is very challenging. A number of published studies have looked at this issue, predominantly in North American and European populations. Accurate figures cannot really be obtained without some sort of formal registry which mandates the reporting of such events, and hence these studies have relied upon a variety of sources for their data, including media reports, data from race organizers or from post-mortem pathology studies. Furthermore, the bulk of research has focused upon acute events during competitive activity, and do not take into account the time spent during training and during recreational leisure time activity.

One such study examined the incidence of cardiac arrest in marathon runners over a 10-year period in the United States.[1] From 2000 through to 2010, these authors examined the outcomes of 10.9 million marathon and half-marathon competitors and found a cardiac arrest incidence of 1.01 per 1,000,000 marathon runners and 0.27 per 1,000,000 half-marathon participants. The mean age of competitors sustaining a cardiac arrest was 42 years. Of the 59 cardiac arrests that were recorded over this period, the overwhelming majority (51) occurred in men and 42 (71%) were fatal. The strongest predictors of survival after cardiac arrest were the initiation of bystander CPR and an etiology other than hypertrophic cardiomyopathy as a cause of cardiac arrest. Interestingly, and probably due to increased popularity and increase availability to previously sedentary individuals, the incidence of arrest was significantly greater in the second half of the ten-year study period (2.03 per 100,000) when compared to the first five years of the study (0.71 per 100,000).

A similar incidence was found by Maron et. al.[2] These authors found an incidence of exercise-related sudden death of 2 per 100,000 by examining data from two North American marathon races over a 30-year period (a study cohort of 215,413 runners). They go on to comment that the extremely low frequency of such events calls into question the benefit that any systemic screening programme aimed at preventing such events might have.

The risk is far greater in men, probably because the overwhelming majority of events are caused by complications coronary artery disease.

CORONARY ATHEROSCLEROSIS AS A CAUSE OF CARDIAC ARREST AND SUDDEN DEATH

Coronary atherosclerosis, either with or without definitive myocardial infarction, is by far the leading cause of cardiac arrest during and soon after physical activity in individuals over the age of 35.

Although small and relatively old (a series of five sudden deaths in well-trained runners over the age of 40 years), a study by Walter et. al. was one that used detailed post-mortem examination to determine the aetiology[3]. All five runners had extensive coronary atherosclerosis and, interestingly, four of the five had evidence of prior myocardial infarction.

More recently, Suarez-Mier and Aguileria conducted a post-mortem study in Spain of 61 cases of sudden death during sporting activity, publishing that coronary atherosclerosis (encompassing significant coronary stenosis, extensive myocardial scar due to previous infarction, acute infarction and/or coronary thrombosis) accounted for 79% of sudden death in individuals aged greater than 30 years[4]. They also cite other studies that have stated that coronary disease is the cause of sudden death in around 50-100% of this middle- and older aged cohort.

ACUTE CARDIAC EVENTS

The mechanism by which the presence of significant obstructive coronary atherosclerosis leads to cardiac arrest is still uncertain, with conflicting views. For many years, the consensus opinion amongst cardiologists was that acute ischaemic events during exercise were due to atherosclerotic plaque rupture as a result of increased shear forces within the coronary arteries that lead to acute thrombosis and subsequent myocardial infarction. This is certainly supported by one angiographic study of 39 survivors of acute myocardial ischaemic events (unstable angina, myocardial infarction and cardiac arrest) which showed that ruptured plaques formed the majority of coronary lesions in the culprit coronary artery.[5]

Evidence from other studies contradict this view, and suggests that most cardiac arrests associated with stenotic coronary artery disease are not in fact due to vessel occlusion but due to myocardial ischaemia in the absence of acute thrombosis and myocardial infarction. In their study of marathon participants, Kim et. al. found that of the five runners who survived cardiac arrest where extensive coronary atherosclerosis was determined to be causative, none had any angiographic evidence of thrombus or acute plaque rupture[1]. They go on to state that it is possible that an acute oxygen demand-and-supply imbalance due to transient ischaemia, rather than actual myocardial infarction caused by complete vessel occlusion, may be the mechanism by which coronary artery disease results in cardiac arrest during endurance exercise.

The Spanish study of Suarez-Mier and Aguileria goes some way to support this, showing coronary thrombosis in only 28% of cases due to coronary disease, and acute infarction in only 8% of these cases.

Further studies are needed to clarify this issue and will assist in designing clinical trials investigating the role of preventative medical therapy, such as antiplatelet agents and HMG-CoA inhibitors ("statins") in preventing cardiac events as well as providing a biologically plausible explanation as to whether or not screening athletes with stress testing would be of benefit.

OTHER CAUSES OF CARDIAC ARREST

Other, non-atherosclerotic, causes of cardiac arrest in middle-aged and older athletes include those commonly attributed to sudden death in younger athletes, such as inherited or acquihired cardiomyopathies (hypertrophic cardiomyopathy and arrhythmogenic right ventricular dysplasia are two examples), primary rhythm conductions disturbances (such as Brugada Syndrome, Wollf-Parkinson-White Syndrome and Long QT syndrome), structural heart disease (septal defects or significant congenital or acquired valvular disease) that acts a substrate for complex ventricular arrhythmias during exercise, and congenital coronaryanomalies[4].

CARDIAC SCREENING PRIOR TO PHYSICAL ACTIVITY

It is reasonable for individuals older than 35 years to undergo some sort of medical assessment and risk stratification prior to commencing a new, or more strenuous, physical activity programme. A detailed history, focusing upon the presence of symptoms suggestive of underling coronary disease is essential, as many of those who go on to sustain a sporting related acute cardiac event have often experienced previous symptoms. This is often challenging, as athletes often expect some level of physical discomfort and may have a higher threshold for pain and will often dismiss symptoms of chest discomfort, dyspnoea and pre-syncope. Family history should question a history of premature sudden death or cardiac disease in surviving family members. A detailed physical examination must incorporate cardiac auscultation, examination of the femoral pulses, looking for manifestations of Marfan's disease and recording blood pressure.

There are differing opinions as to whether or not a 12 lead ECG should be part of routine pre-participation screening. Given its minimal expense, lack of risk and the chance of detecting abnormalities that may lead to the diagnosis of cardiomyopathy or rhythm conduction disorders (and rarely, but still possibly, the presence of previously silent myocardial ischaemia), it is very reasonable to use it as a screening test. Risk assessment will also require the laboratory assessment of fasting lipid and glucose status.

Although exercise stress testing is used to screen for coronary artery disease in elite athletes and is often marketed as a means of easing anxiety in apparently healthy individuals, there is no evidence to support its use in such way. The American College of Cardiology (ACC) and the American Heart Association (AHA) believe that the use of exercise stress testing as a routine screening test for the detection of coronary atherosclerosis is contraindicated (that is, there is evidence of either harm or a proven lack of benefit) in asymptomatic men and women[6].

Exercise testing may be considered in asymptomatic patients who are considered to have a high risk profile. The ACC/AHA guidelines state that diabetic patients who plan to commence a vigorous exercise programme, individuals with multiple risk factors, women over 55 years and men over 45 years who have previously been sedentary or patients with documented non-coronary vascular disease have a class II indication for exercise testing[6]. The American College of Sports Medicine has similar recommendations.

It must be remembered that cardiac stress testing is designed to detect or exclude (either by ECG monitoring, echocardiography or nuclear perfusion imaging), the presence of inducible myocardial ischaemia caused by haemondynamically significant coronary artery stenosis. It does not exclude the presence of minor coronary plaques and a normal test does not provide a guarantee that in individual is immune from acute ischaemia events for any definable period of time. It might detect evidence of silent ischaemia in the high risk groups that it is indicated in, and as discussed above, many acute cardiac events associated with sporting activity are due to ischemia in the absence of plaque rupture, coronary thrombosis and acute myocardial infarction. It is for this reason, and to allow appropriate exercise prescription on those individuals with silent ischaemia, that stress testing is of some benefit. It will not, however, detect minor coronary plaques that may become unstable and lead to acute vessel occlusion and infarction once ruptured.

CT coronary angiography is very good at excluding significant coronary atherosclerosis, but is not currently recommended as a screening test in asymptomatic individuals without any

other objective evidence suggesting its presence upon initial assessment and 12 lead ECG. It has a proven role in triaging patients presenting to emergency departments with chest pain, where, when performed correctly, it can potentially rule out or diagnose significant coronary atherosclerosis, aortic dissection and acute pulmonary embolus. Its place in the assessment and risk stratification of asymptomatic individuals undergoing vigorous physical activity is the focus of numerous ongoing clinical research studies, but at present, because of its costs, associated radiation exposure, inability to determine the haemodynamic significance of any coronary stenosis and the lack of data to guide physicians about appropriate intervention if sub-clinical disease is actually diagnosed, it cannot be currently recommended for screening purposes. CT coronary angiography should be considered to be a diagnostic test used in patients with an intermediate pre-test probability of coronary artery disease, as an alternative to exercise testing, or in those patients with an inconclusive exercise test results or who are not suitable for any form of stress test.

If indeed it is true that the majority of cardiac arrests due to coronary atherosclerosis is due to acute ischemia, rather than coronary occlusion and consequent infarction, then the use of stress testing to detect previously asymptotic ischaemia may indeed have a biologically plausible role.

PREVENTING ACUTE CARDIAC EVENTS

As is demonstrated by the observational study of Kim et. al., pervious experience and adequate preparation for endurance events is vital[1]. Firstly, they showed that the incidence of cardiac arrest was far greater in the fourth quarter of marathons than during the first three-quarters. Secondly, the number of previous long-distance running races competed was an independent predictor of survival from cardiac arrest. One way of looking at this, and what one would hope that all medical practitioners, coaches, fitness advisors and event promoters already do, is to reinforce the need for attempting shorter distance events followed by an appropriate period of adequate training before contemplating endurance events.

Education is also important as these events gain popularity, with potential participants being educated about the symptoms that may represent underlying coronary disease and encouraging such individuals to seek medical advice before embarking upon these endeavours. Accompanying this need for athlete education is the need to educate health practitioners about the best ways to identify high risk individuals. Walter's study of necropsy findings looked in to the past medical history of the five runners who died as the result of coronary atherosclerosis and found that one runner had been symptomatic (as well as having an abnormal resting ECG and exercise tress test) whilst four had documented hypercholesterolaemia and two had known systemic hypertension.[3]

It is self-evident that the timely diagnosis of coronary disease in athletes who are symptomatic will obviously allow appropriate medical and, if needed, percutaneous or surgical revascularisation to reduce long term risk. It will also permit the experienced clinician to ascertain the risk of such events and prescribed appropriate exercise, rather than simply exclude that patient form all forms of physical activity. The European Society of Cardiology provide an excellent and thorough guideline to exercise prescription for individuals with coronary artery disease[7], This guide patients according to their clinical syndrome (stable angina, unstable angina, silent ischaemia, post myocardial infarction and post coronary revascularisation) as well as according to their risk profile and make clear recommendations about their suitability for both competitive and leisure-time activities. An interesting thing to note from this document is that the author's comment that patients with silent ischaemia have the same risk of cardiac arrest during physical activity as those with symptomatic angina. This finding therefore supports the use of exercise testing to detect ischaemia in high risk individuals who are otherwise asymptomatic, as the identification of this ischaemia will allow exercise prescription advice that will minimise the risk of acute exercise-related cardiac events.

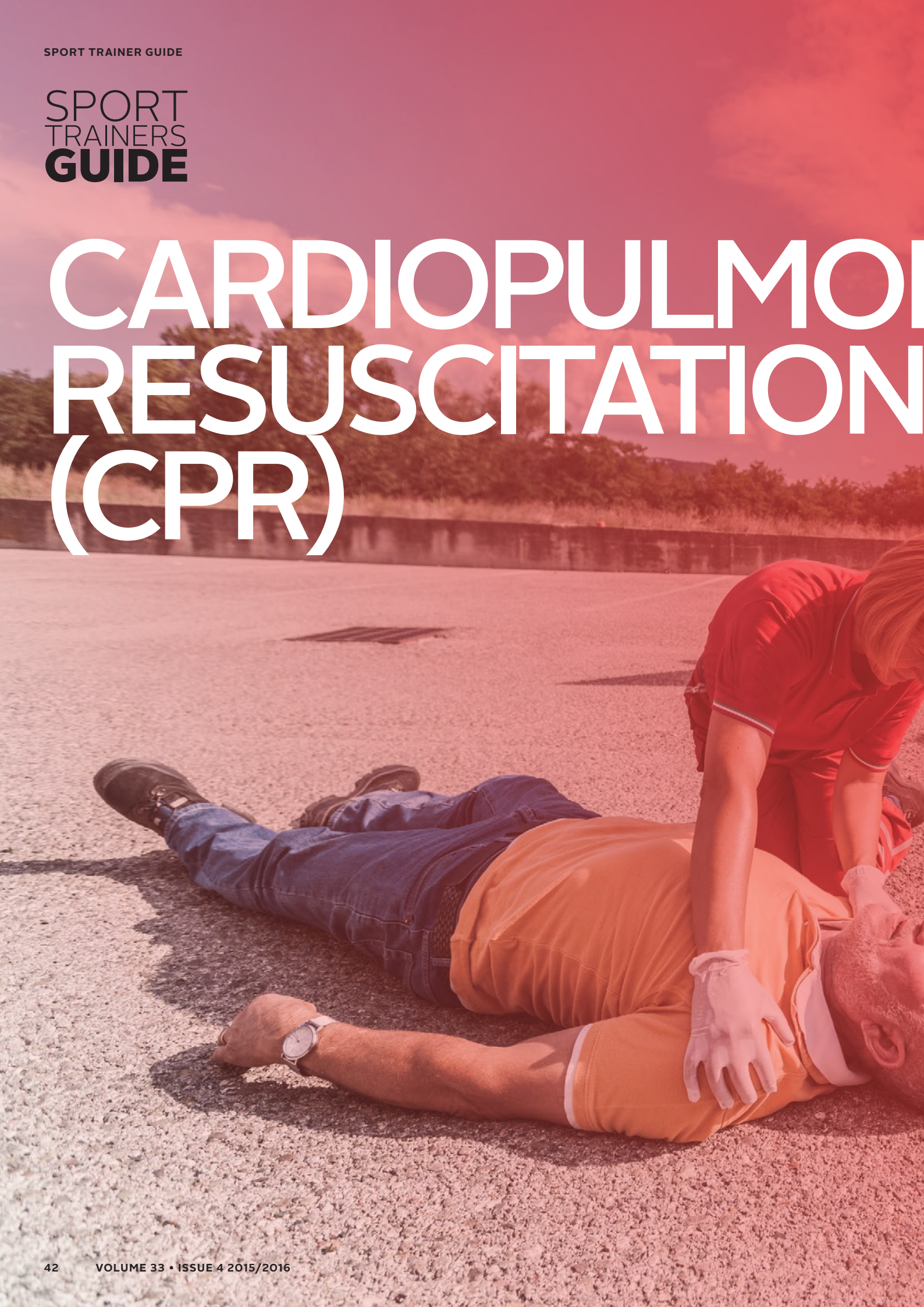
ABOUT THE AUTHOR

David Bertovic is an experienced cardiologist at Cabrini Medical Centre in Melbourne. He is also a member of the Baker IDI Heart and Diabetes Institute.

VIEW REFERENCES HERE

SPORT TRAINERS GUIDE

CARDIOPULMO RESUSCITATION (CPR)



NARY

SPORTS MEDICINE AUSTRALIA PROVIDES SPORTS TRAINERS WITH A GUIDE ON HOW TO PERFORM CPR IN AN EMERGENCY

CHAIN OF SURVIVAL

The Chain of Survival highlights four key stages in the care of a casualty whose heart and breathing have stopped and needs resuscitation.

Each link in the chain represents a vital step in the care given to a casualty that needs CPR. If one link in the chain fails then the chance of a good outcome for the casualty decreases significantly.

CHAIN OF SURVIVAL – 4 LINKS:

1. Early Access – to get help as soon as you identify a problem
2. Early CPR – to buy time
3. Early Defibrillation – to re-start the heart
4. Early Advanced Life Support – to stabilise casualty in order to minimise damage and increase the chance of a full recovery

As a first aider, you play a vital role in the Chain of Survival. Your actions in the first three links can increase the success of the final link.

DRSABCD – STEP-BY-STEP INSTRUCTIONS

1. **Check for danger –** Make sure it is safe to approach casualty

2. **Check for response**
   - **C**an you hear me?
   - **O**pen your eyes if you can hear me
   - **W**hat is your name?
   - **S**queeze my hand and let go if you can hear me

3. **Send for help – Call 000 and ask for ambulance**

4. **Clear and open airway**
   - Look in casualty's mouth and check for anything that may block their airway
   - Clear out any foreign material from casualty's mouth
   - **Take care:** If there is water, vomit or blood in casualty's mouth turn them onto their side to assist in clearing this out
   - **Take care:** Tilt casualty's head back while lifting and supporting their jaw to open airway

5. **Check for normal breathing**
   - Look for regular movement of lower chest or upper abdomen
   - Listen for any sounds of breathing from mouth or nose
   - Feel for any regular movement of lower chest or upper abdomen

6. **Start CPR – 30 chest compressions**
   - Place your hands on lower half of sternum in centre of chest
   - Compress lower half of sternum approximately 1/3 of chest depth
   - Give compressions at rate of almost two per second (approximately 100 per minute)

7. **Give two rescue breaths**
   - Ensure casualty's mouth and nose are sealed
   - Blow gently into casualty's mouth until their chest rises
   - Remove your mouth to allow air to be expired from casualty's chest
   - Give second rescue breath

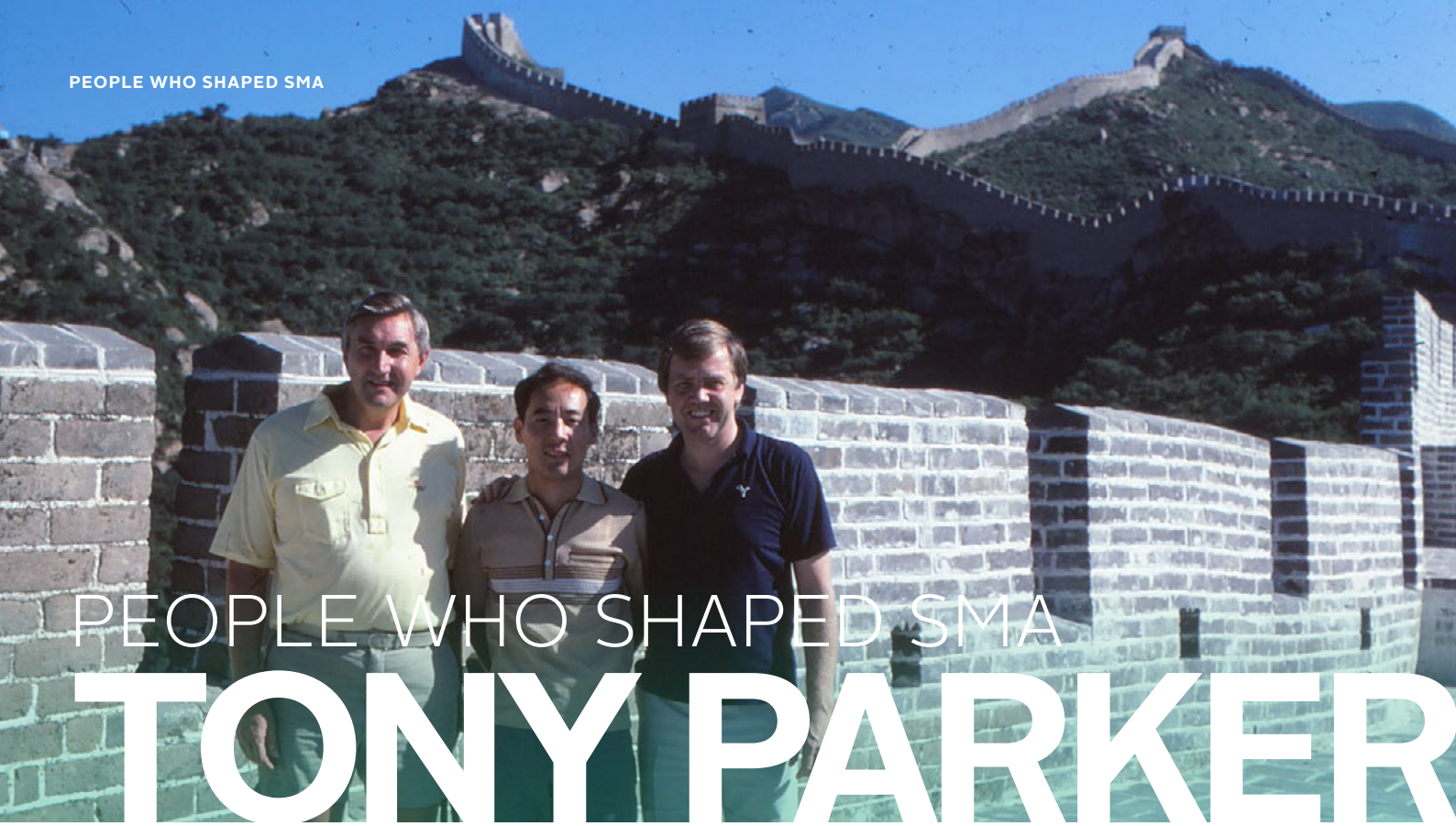
8. **Continue to give regular cycles**
   - 30 chest compressions then two rescue breaths at rate of five cycles every two minutes

9. **Attach defibrillator/AED if available**
   - As soon as possible and follow its instructions
   - Restart CPR as soon as shock has been delivered or as soon as AED indicates that no shock is advised

10. **Continue CPR**
    - Until casualty starts breathing
    - Until ambulance or medical aid arrives and takes over
    - Until it becomes dangerous to continue due to fatigue or other hazards

11. **Watch for any signs of recovery**
    - Return of normal breathing and response
    - Casualty starts breathing normally but is still unconscious (place them on their side in a stable position)

Want to learn more on CPR? Sports Medicine Australia runs the following CPR courses: First Aid and CPR Update. Visit sma.org.au for more information.



PEOPLE WHO SHAPED SMA
TONY PARKER

When did you first decide on a career in sports medicine?

I started my academic career in 1973 as one of a small group of people given the task of developing Human Movement Studies (HMS) at the University of Queensland (UQ).

Describe your educational background

My lifelong active involvement and interest in sport led to my initial qualification of Diploma in Physical Education in the UK. After a short period of high school teaching, I immigrated to Australia and worked for the Department of PE in Tasmania and subsequently gained a scholarship to study at the University of Oregon where I completed my PhD in 1973. I moved to Queensland for a joint appointment in the Schools of PE and Department of Anatomy and in my final years at UQ was Head of Department of Anatomy.

After 16 years at UQ, I was appointed Foundation Chair in Exercise and Sports Science at the University of Wollongong (1992) and then Foundation Chair of Human Movement Studies at Queensland University of Technology (1994-2005). I am currently a research leader of the Workplace Innovation Research Group in the Institute of Health and Biomedical Innovation at QUT.

How did you first join sports Medicine Australia and what was your initial role?

After attending the first SMA overseas conference in Singapore in 1976, I was appointed to the Board of the Queensland Branch of ASMF and commencing in 1977 represented Queensland on the National Board of Directors and member of National Board (1982-1990). I contributed to the development of the Australian Sports Trainers Scheme which provided an international model for other countries re community education in sports medicine and was awarded life membership in the Queensland Branch of SMA in 1986.

After your initial beginning at SMA what positions did you hold during your time at SMA?

I held numerous roles, including: inaugural Treasurer; President (1986-1988); and President, Order of Fellows (1986-1990). A significant visit to China with President Bill Webb in 1984 led to establishment of links with the then developing Chinese Sports Medicine Society.

What were some of the major decision that you helped make or changes you implemented while at SMA?

Prior to and during my period in, SMA were extensively involved in leading committees associated with accreditation of sports medicine and exercise and sports science professionals During my period of Presidency there was considerable discussion concerning the need for greater recognition of professional standing of groups within SMA, with recognition that SMA, although an excellent umbrella organisation, was unable to support and provide greater professional recognition of groups in sports medicine such as exercise and sports scientists. This resulted in the establishment of the Sports Physicians organisation and my continuing promotion and extensive discussions on the need for a professional organisation to enhance the status and recognition of professionals in the field of exercise and sports science. This led to the establishment of ESSA (originally AAESS) in 1992. As co-founder, I served as Foundation President from 1992–1999 and was awarded life membership in 2002.

A MOMENT WITH TONY

What has been your career highlight?

Perhaps the two major areas are:

Leadership in the contributions to the progressive development of the University and Professional status of sports medicine and exercise and sports scientists, leading to the very successful development and expansion of ESSA which is now recognised as a peak body internationally and raising the international profile and recognition of SMA and ESSA and identification and implementation of opportunities for continuing development of these fields Internationally and particularly in the Asian region.

What is your advice to those starting out in their career?

To remember that mastery of a particular discipline is only one step in the process of learning as learning continues throughout life. All of the disciplines/professions in which we are involved are constantly changing and it is important to stay current.

It is also important to maintain a passion for what excites and motivates and it is the key ingredient in being satisfied and challenged.

I have continued my passion to promote the positive impacts of sport, sports medicine and exercise and sports science on the health of the community. The opportunities and settings to translate this knowledge and understanding may change according to different career paths, but the fundamental beliefs will not.

What was your most important contribution at SMA to its profession and industry?

I have contributed to sports medicine and exercise and sports science as an academic, researcher and author and through executive and advisory roles with national and international professional organisations. I have a broad research and publication record in areas of Sports Medicine and Exercise and Sports Science.

During my period as president, my involvement included the clarification of professional roles and capabilities of SMA. This resulted in enhanced government and community recognitions of the importance of sports medicine and its holistic contribution to Australia's (sporting record) community health and fitness.

In 1989 I was awarded life membership of SMA and the President's Award in 1997 for contributions to Sports Medicine and Sports Science in Australia, Oceania and Internationally.

What has been your job history outside of SMA?

I have been committed to the development of strong organisational and academic links between SMA and ESSA and International Organisations for more than 30 years which has contributed to raising the international profile of SMA. This has involved leadership as scientific chair of major International Sports Medicine Conferences hosted by SMA, including the ASMF International Conference on the Medical and Scientific aspects of Elitism in Sport associated with the Commonwealth Games in Queensland in 1982. This was followed by the XXIII 1986 World Congress held in Brisbane and following this very successful event, I was appointed to represent Australia and Oceania on the Executive Committee of the International Federation of Sports Medicine (IFSM) and was involved in different executive positions for more than 25 years.
From 1996-2008 I was also a member of Executive Committee and Vice President (Sports Science) of the International Council for Sports Science and Physical Education (ICSSPE) and in this role was chair of the International jury for the IOC President's Award for sports science.

Involvement in these two international organisations, led to the role of chair of the 2000 Pre-Olympic Congress hosted by SMA, which continued to provide opportunities for extending SMA's and ESSA's links and recognition internationally. My final event with ICSSPE and IFSM was as Chair of the International Liaison Committee for the 2008 International Convention on Science, Education and Medicine in Sport, as part of the Beijing Olympic and Paralympic Games.

I have maintained involvement with IFSM by contributing to the International Collaborating Centres in Sports Medicine program which I developed and which was launched in 2013.

In 2003, I was awarded the Philip Noel Baker Research Award from ICSSPE and in 2006 made an Honorary Fellow of IFSM.

In 2008, I was made a Member of the Order of Australia (OAM) for service to sports medicine and exercise science as an academic, researcher and author and through executive and advisory roles with professional organisations.

Since my first visit to China in 1984, I have continued to liaise and work with members of the Chinese Sports Medicine and Sports Science Societies and have assisted in raising the profile of China and the Asian Federation of Sports Medicine in Australia and internationally. Most importantly I have assisted young scholars from China and developing countries to enhance their research and professional skills and increase their understanding of global activities in sports medicine and sports science.

In 2012, I was honoured with the Chinese Sports Medicine Society's award for outstanding contributions to Chinese Sports Medicine.

COUNCIL OF DISCIPLINE
NEWS AND EVENTS

Sports Dietitians Australia (SDA)

New Year, new Board. SDA Board welcomes Clare Wood, Ali Disher & Alison Patterson and Simone Austin as our new President. SDA looks forward to progressing our strategic goals of creating Smart & Savvy members and increasing engagement between Accredited Sports Dietitian and the 'seriously sporty' population. Find your nearest at www.sportsdietitians.com.au

Sports Physiotherapy Australia (SPA)

SPA NSW monthly lecture series run second Thursday of the month. All disciplines welcome.

SPA have a series of courses running throughout the upcoming months:

- April 6 – Advanced Sports Taping, Sydney NSW
- April 9-10 – Introduction to Dry Needling for sports and spinal injuries, Melbourne VIC
- April 16 – Foot and Ankle in Dance, Kent Town SA
- April 16–17 – Practical physiotherapy management of lower back pain, April Eight Plans QLD
- April 29–May 1 – Sports physiotherapy Level 2
- April 30–May 1 – Sports physiotherapy Level 1, Bentley WA
- May 6–8 – Sports physiotherapy Level 2, Palmerston NT

Please check the APA website for further information and registration.
https://www.physiotherapy.asn.au/apawcm/LearningDevelopment

CALENDAR

APRIL

13

Body Composition, Assessment & Interpretation

Champions Room, MSAC, Aughtie Drive, Albert Park.
Registration and event information at www.sportsdietitians.com.au.

MAY

6

Deadline for Australian Academy of Podiatric Sports Medicine (AAPSM) research grant applications.

To obtain a copy of the guidelines and an application form, visit the AAPSM website.

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ISSN No. 1032-5662
PP No. 226480/00028