Sport Health

Incorporating The Bulletin

SPORTS MEDICINE AUSTRALIA

Publisher
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Circulation: 5000
ISSN No. 1032-5662

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SUBSCRIPTION RATES 2003

Australia A$35
Overseas A$50

SMA members receive Sport Health as part of their membership fee

Single copies and back copies A$15 (includes-postage)

PP No. 226480/00028

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Cover photograph: Australian Sports Commission

Team spirit in the team behind the teams

By Marilyn Feenstra, President of SMA

Sports Medicine Australia is recognised internationally as being the best multidisciplinary organisation. Is this changing? We have to make every effort to ensure that it does not.

I have been a member of SMA for longer than I care to measure. I joined this organisation because of the broad band of knowledge I could gain, the ability to have a wide base of referral areas to practitioners with specialist expertise. Meeting and networking with other professions than my own at conferences and seminars expanded my outlook and practice.

We are "the team behind the teams" and, to maintain this, we need to hold firmly on to SMA"s multidisciplinary ideals.

Ten years or so ago, the areas of specialisation took on great importance. Sports physicians began to specialise. They used communication with other professions to extend their knowledge and also to build up a base for referrals to their practices.

They were very active in New South Wales in holding seminars and other kinds of discussion where people came together to have an input into treatment and diagnosis of specific problems. Barely a month went past where there was not some educational discussion group. Alongside this development, other professions also became more specialised. Sports physiotherapy, sports podiatry, sports science, sports dietitians, etc came into focus.

Have we reached a plateau now where it is easy to gain knowledge within each professional specialist group but in doing so have tunnelled our vision? Is it restricting our outlook on referring to the best practitioner to treat a specific problem? Are we still a team?

We hear members who have visited our organisation from other countries (eg, Canada and the United States) who are alarmed to see that this is the direction we are creeping. I feel we could be putting a dampener on the development of sports medicine and science in general here; in other words, having a concentration of specialisations, each profession building extension of knowledge within its own inner circle and not going beyond that inner circle. One significant result is that treatment protocols that could otherwise be expanded with more communication on a broader basis are actually being restricted.

SMA has spent many years and huge resources developing, encouraging and consolidating the multidisciplinary approach because of the great and clear benefits that sports practitioners and their clients – and the entire community -- derive from it. These benefits are limited when injury prevention groups go their separate ways.

A new wave of practitioners is entering or has recently entered practice. We need to reseed the need for the multidisciplinary approach to sports medicine. We need to show these practitioners that the quickest way to build a practice that is successful in sports medicine is to broaden their perspective. Look outside your square.

Our national conferences are highly important in this context. The 2004 Conference in October in Alice Springs will provide an extraordinary opportunity to reassess our multidisciplines. Everyone is in the one place, which is a great help for networking and having discussions with other groups, learning what they do and how they work, discovering the possibilities in what they are doing and researching, broadening the spectrum of knowledge in sports medicine.

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Making a difference

By Gary Moorhead

Thanks to the Australian Sports Medicine Federation Fellows and the Federal Department of Health and Ageing, policymakers in public health will find that they have access to a new and valuable resource.

The Fellows provided the seed funding for a project to bring together and publish the latest research findings on interventions to promote physical activity that have actually shown some success. The findings will be published in a special edition of the *Journal of Science and Medicine in Sport* (JSMS). The initiative of the Fellows to provide the seed funding was the catalyst that prompted the Federal Department of Health and Ageing (DH&A) to get on board and also financially support the project.

Almost everyone knows now that regular sport and physical activity confer a wide range of health and other benefits. The flip side of this is that inactivity results in higher rates of disease and other reductions in quality of life. Fewer than 50% of adult Australians do enough physical activity for health benefit and the trend is worsening[(1)]. Australia is one of the few developed countries where activity rates are going backwards. (So much for the trickle down effect of the Olympics!)

However, finding and implementing effective policies to reverse this trend is no simple task. Inactivity can be a more insidious drug than nicotine. Unlike the campaign against smoking where the task was to get people to stop, with physical activity, we are trying to get people to start.

Thanks to the Fellows and DH&A, those working to find ways to help the couch potatoes will have a much greater chance of success.

The special edition of the JSMS begins with an excellent update of the epidemiological evidence on the health benefits of physical activity, written by Australia's leading physical activity epidemiologist, Professor Adrian Bauman. The edition also contains reviews of the very latest evidence about successful interventions to promote physical activity in a wide variety of circumstances and situations. Included are interventions specifically targeting different age groups (children, adolescents and young adults, older people), in different settings (schools, workplaces, primary care), comparing different types of mediated approach (print, electronic, web-based) and for those with specific chronic health problems (diabetes and obesity). Interventions targeting falls prevention, those using progressive resistance training for older adults and the role of the physical environment are also detailed.

The final paper compares approaches to developing national policy for physical activity across a number of countries and makes it clear there is no single "magic bullet" available to solve the problem of inactivity (although a number of countries appear to be doing better than us!)

In fact, the research reviewed shows that best results to date have been achieved in primary care settings. Making this point in the introductory paper to the special edition, the coordinator of the project, Sports Medicine Australia's Public Health Spokesperson, Professor Wendy Brown, says "there is however still much to be learned about how to recruit less-motivated individuals into general practice-based interventions, and how to involve a wider range of health professionals in this type of intervention"[(2)].

Sports Medicine Australia, as a multi-disciplinary organisation of health professionals with a specific interest in sport and physical activity, is ideally placed to spearhead such a move in Australia.

Recognition of the important role that SMA's members can play in the fight against inactivity can be seen in the greatly increased focus placed on the issue at SMA state and national conferences, in our publications and in the conferences and publications of the various disciplines in sports medicine and science.

It will be interesting to see how seriously the issue is taken by the major political parties in the run up to the next federal election. Last year the Federal Government released the Intergenerational Report with its description of the potential adverse impacts of an ageing population. Populist politicians also like to describe in graphic detail the potential dangers in a "tidal wave of the elderly".

In fact, many of the problems and costs of an ageing population can be mitigated by increasing activity rates. Finding the strategies to do this will be made much easier by the publication of this edition of the JSMS. Finding the political will to tackle and fund meaningful interventions might be more difficult.

Perhaps it is time for the Federal Government to copy the successes in health promotion achieved by a number of states that have established independent health promotion agencies – with separate and dedicated funding streams. And if political parties are feeling exceptionally bold they might even

consider funding such an agency from taxes levied against causes of ill-health such as tobacco and unhealthy food.

Deakin University's Centre for Physical Activity and Nutrition Research says that, in a recent survey of public views about the causes of obesity, "the most important perceived causes of childhood obesity were related to overconsumption of unhealthy food"[3].

While there is clearly room for debate about this (and most SMA members would agree that inactivity has a lot to do with obesity too) perhaps here we have a chance for the convergence of good policy and good politics – a tax on smoking and high fat food to fund a national health promotion agency to address the epidemic of inactivity in this country.

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2. Brown W. Physical activity and health: updating the evidence 2000-2003. *J Sci Med Sport* 2004;7;1 (Physical Activity supplement);1-5.
3. C-PAN Newsletter, Issue One, December 2003, page 4.

Don't miss the real Internet revolution

By Dr J

For those of you who are now comfortable at using email and reading the newspaper on the web and therefore feel you have already lived through the big wave of the Internet revolution, strap yourself in for the next five to 10 years. Publishing on the Internet, particularly publishing that is driven by underlying databases, is going to change the way that most of us do business (as both producers and consumers). In some industries this has already happened, and the way in which it has occurred or appears about to occur is a guide to what most businesses should expect in the near future.

One of the major revolutions driven by teenagers (incidentally an age cohort that will be extremely powerful in the next few years because they have grown up expecting to use computers in every aspect of life) has been the downloading of free music.

The major record labels have been carrying on like pork chops about music piracy, but it hasn't affected them enough to reduce the price of a $25 CD, which costs them about 20 cents in material costs to make, plus labour costs.

We know about the 20 cents, because that is all a blank CD bought in bulk costs us if we want to make a CD copy for ourselves on a home burner. We also know the record labels can get labour pretty cheap by the fact they can afford to give away promotional CDs with $1.50 Sunday newspapers. But we also keep buying enough of the $25 CDs to keep the recording companies nice and profitable for now.

The future in this industry is very easy to see (and even happening over the next few months): the availability of legal pay per download music from the Internet set up by the recording companies at a price around $1-2 per single and $5 per album. This will be quite similar to the newspapers who to date have not minded setting up free Internet sites in competition to their own print newspapers on the basis that they are still selling plenty of the hard copy variety.

Another impressive way that Internet databases are changing the way people behave is in the real estate industry.

Buying or renting a property is still a major pain, but instead of spending entire Saturdays driving by a dozen properties, most of which you will reject in the first 30 seconds of viewing, you can now screen for most features on the Internet. Consumers expect photos of all rooms and floor plans on real estate Internet sites, which is a big improvement on the "renovator's dream" information you get in a 4-line ad.

Buying and selling used cars haven't been as revolutionised just yet but expect the same to happen for the same reasons, and the percentage of sellers who lie on the Internet to be no higher than in the 'real world'! The big difference between traditional publishing and Internet publishing is price per word, with the Internet being hundreds of times cheaper, so that far more information becomes the industry standard.

A very similar (almost completely new) industry is on-line dating which, however clinical it sounds, is successful for the same reasons that floor plans on real-estate sites are popular. Some reactionary people, usually over 30 and incidentally members of a generation that has an appalling track record with respect to successful relationships, don't understand or don't want to understand the benefits of online dating, but it is very hard to argue against the huge numbers of particularly younger people who are using the Internet to meet partners.

The bottom line is that as humans we are all fussy to a degree in relationships. For up to two dozen personal criteria on which you may or may not care to have a preference (e.g. smoker/non-smoker, likes pets/doesn't like pets, wants to have children/doesn't want to have children, strongly religious/mildly/atheist, straight/gay/bats both ways, meat eater/vegetarian, wants to stay put/nomadic, etc.), there are potential partners whom you might meet in everyday circumstances who will fit some of your preferences. When it comes to meeting someone who fits the vast majority of your preferences and vice versa (which has to correlate with ultimate success of the relationship), it is much easier to find someone highly compatible if you are searching through a database of 100,000 singles than if you are searching through the crowd of 10 people you are speaking to at the pub.

Importantly, this doesn't mean either that a computer is selecting your potential partner or that you will hit it off with someone in real life who seems very compatible over the Internet. It just gives an enormous head start in making the right choices, which is why many young adults particularly are in the habit of meeting people using the Internet and thinking

that it is actually the desperates who would rather search for a partner at a pub or nightclub.

How do these anecdotes have relevance to sports medicine practice?

Traditionally, the number one and two criteria used to select a practitioner when a patient is injured have been location and word of mouth. If there is a physiotherapist, for example, within a couple of kms who your friend was happy with, then you might go there yourself to have your own injury treated. It's not a bad way to start, but it isn't perfect. Just say you are recovering from a dislocated shoulder. How do you know that the practitioner you are planning to see is an expert at, and is regularly treating, dislocated shoulders?

Most physios if confronted would say that they are experts in this area, but so would most osteopaths and sports physicians and surgeons. Some chiropractors might manipulate your spine for treatment and maybe even some rogue podiatrists might even correct your pronation in order to stabilise your shoulder a bit more.

The traditional best resource for a patient to find basic information about a practitioner has been the Yellow Pages, which will list phone number, suburb and type of practitioner at best. If you want more information you can dial a number in the directory, but the best information you are likely to get is opening hours and costs for treatment. From the reception desk over the phone, you are highly unlikely to get detailed information that you might want. Is someone in the practice specifically an expert at treating dislocated shoulders, for example? Does your type of dislocation require an appointment with a doctor or a physiotherapist or someone else?

This is where the potential of the Internet gets exciting.

The Internet can function like a much more interactive version of the Yellow Pages. You specify your location and your problem and you get not only a list of practitioners in that suburb, but also links to large amounts of detail about the specifics of each practice and the problems they treat.

It is at this point that I hope you can appreciate the analogy with a dating website. Traditionally it would be the height of rudeness to ask an eligible person whom you had just met whether they planned to have some (or more) children but, on a dating website, if you don't specify this information your profile won't turn up on any searches based on this criterion (which is specified as relevant by the vast majority of users on dating websites).

Not just traditionally, but even in 2004, a patient calling up an orthopaedic surgeon's office to ask the surgeon's charge for a shoulder arthroscope and the number of these procedures he or she performs in a year will probably not get a full answer. From a consumer's ideal viewpoint, this is unsatisfactory. At the moment, very few surgical websites list charges and experience for various operations on their websites. This is like the record companies who are doing good enough business at their current CD prices to not lower them, or the married person who can't understand why anyone single would look for a date on the Internet.

With respect to sports medicine, eventually the cycle will be broken. Once some surgeons start listing their prices for operations on their websites, there will be some patients who will avoid surgeons who don't provide this information. As some practitioners list the types of injury or parts of the body or types of injury that they are most expert at treating, practitioners who don't provide this information or claim to be experts at everything will be treated with scepticism.

The Internet has been predicted to spell the death of many industries and processes, most of which have proven remarkably resilient. The printed page has never been more popular, which is due to the fact that more people are reading more often, even though an increasing percentage of this is done on the Internet. A great illustration of the use of this combination is the site Amazon.com, at which you can read previews and reviews of books and then order the real thing over the Internet. More people than ever (both professional and lay) are reading scientific papers, with many getting to what they want to read about via the PubMed site. If you have never used PubMed or Google to look up something in the sports medicine field, then you really need to get (less of) a life! Even shopping for groceries, one of those joyful tasks of 'real life' that we would miss terribly if we didn't have to do it, is becoming popular on the Internet. Yes, I still like to pick my fruit and vegetables at the store in person to make sure I like the individual pieces, but I sometimes wonder why I bother

to wait 10 minutes in line when I am buying packaged goods that I could be getting delivered online.

The Internet won't mean that people will stop picking up at pubs and weddings, or will stop enjoying browsing through the shelves of the local bookstore. Unfortunately it also won't mean that real estate agents become extinct! It won't mean that practitioners who don't have websites will go out of business either.

I can see more patients coming to sports medicine clinics via the Internet in the future and, because the ones who do are more likely to be satisfied (because they will have made sure in advance that they are heading to the right place), they will use the services more often and there will be more business for all.

Like the many other examples listed above, the Internet will create new growth rather than cannibalise existing business.

OK, I'm sure that many of you will have picked the conflict of interest in my opinions on this issue given that I run a sports medicine website called www.injuryupdate.com.au. If you have any problems with this opinion, log into the feedback section of the website (called 'Forum') and post your complaint. Get ready for me to write back and say 'I told you so'.

Letter to the Editor

It is with regret that I wish to notify SMA of my intention not to renew my membership with SMA when it falls due.

At 51 years of age and over 38 years of active involvement in sport as a player, coach, mentor, sports trainer (Level II), sports club administrator, etc, I am retiring and moving to a new home.

My many years of involvement with sport have seen me attend local, state, national, Olympic and Paralympic venues for able-bodied and disability sports. I have met a wide circle of very professional and wonderful people.

I have always enjoyed my involvement with sport and attained my 1000 hr certificate from ASTA a few years ago. I have never regretted my decision to be a volunteer. It has given me some of the most memorable moments of my life.

My direction now of travelling and following other pursuits will not allow me to devote any regular time to sport.

Thank you to SMA for being such a professional, essential and dependable resource for me during my involvement with sport

Debbie Lang

Greenpoint NSW

Editor's Round Table

Is 30 minutes of physical activity enough for health benefits?

Participants:
Professor Wendy Brown, School of Human Movement Studies, University of Queensland;
Professor Kevin Norton, School of Health Sciences, University of South Australia;
Professor Adrian Bauman, School of Public Health, University of Sydney

Editor:
Professor Kerry Mummery, School of Health and Human Performance, Central Queensland University.

This is the first in a series of "Editor's Round Tables" aimed at collecting the opinions of national and international leaders in various fields on issues pertinent to **Sport Health** and its readers. It revisits the formal debate organised by Professor Wendy Brown at the 2003 Australian Conference of Science and Medicine in Sport in Canberra to discuss the "30-minutes-of-physical-activity-a-day" message in light of the recommendation of a minimum 60 minutes a day by the US Institute of Medicine. Professors Adrian Bauman and Kevin Norton faced each other on opposing teams in that debate, with Professor Brown acting as the (impartial) moderator. This Round-Table frees them to discuss the issues surrounding the promotion of health-related physical activity from their own perspective and background.

Ed: Wendy, it was really you that was the catalyst behind the debate at ACSMS last year and the question that you posed was this: "Is 30 minutes of moderate activity on most, preferably all days of the week sufficient for health benefits"? What's your current position on that?

WB: Well, I'd have to say that, despite the fact that the 60 minutes team 'won' the debate, the answer to this question is definitely yes, 30 minutes is sufficient for health benefits. Almost all the literature shows that there is about a 30% reduction in risk in a wide range of health problems with 30 minutes of physical activity, compared with doing nothing. There are variations for specific health problems, but I'm going to leave that for Adrian.

Ed: Kevin, what's your take on this now? Is 30 minutes of moderate activity sufficient?

KN: Well, there is no question that 30 minute a day on most or all days of the week is sufficient for health benefits. Numerous longitudinal population-based studies have shown a strong link between physical activity and the cardio-protective role, improved metabolic control and blood lipids profiles and so forth. But there is also quite a bit of evidence that greater levels of physical activity—that is, physical activity beyond 30 minutes-per-day—will confer additional benefits. So the dose response curve shows that you can improve your return if you like, gaining additional benefits by increasing your load up to 60 minutes per day.

Ed: Adrian, can you give us a little bit of your insight on the 30 minute message that's out there versus maybe the 60 minute message?

AB: Although the '30 minutes' argument lost the debate, it appears to be unanimously winning the science, as evidenced by the previous two comments. I take a public health approach when I define health benefits. I define them as how do we achieve the maximum benefits attributable to a recommendation or a guideline and, in taking a whole-of-population benefit approach, the benefit that will accrue for mainly cardiovascular disease, diabetes prevention and hypertension control. They will sum to the greatest health benefit that we could obtain if we got the population to do the recommended levels of activity. Additional health benefits from more activity are present for things like weight control and for cancer prevention for the two cancers for which physical activity has a role, but in net sum these contribute a smaller quantum to total health gain than achieving the 30-minute goal, so I still target the 30 minute goal as a public health, or a population change message.

Ed: Wendy, you are one of the Chief Investigators on the 10,000 Steps Rockhampton study, using pedometers and the 10,000-step-a-day message to promote activity. How do you reconcile the accumulated-activity approach to the 30-minute-message approach?

WB: I guess if you look very carefully at the way the 30 minute message is worded in the guidelines, it does say try to accumulate 30 minutes on most days of the week. What it doesn't mention is that this should be in addition to everyday incidental activity. So it doesn't mean that you can sleep for eight hours a day, sit down for 15 and a half, and then do 30 minutes of activity. It means in addition to your normal everyday

activity. If you wear your pedometer around the office as I do - this is a very sedentary job - you would clock up about 4,000-5,000 steps a day. If you then try to get up and walk around more often, maybe to get a drink or deliver a message by foot, you could maybe crank that up to 7,000 steps. You will still need to find 3,000 steps to get to 10,000 steps a day and that's where the 30 minutes of structured or planned activity comes in – 30 minutes is about 3000 steps.

Ed: Kevin, you bring an exercise physiology background to the question, so total energy expenditure over a 24 hour period, as opposed to the thirty-minute message, how would you reconcile that?

KN: Well, I think on the one hand these pedometers are good in that they encourage movement, but I'm concerned, like Wendy, that people think that accumulating steps is all that they need to do. It really relates to increasing levels of activity over and above what they would typically do. The problem being of course is that people's background of daily movement is decreasing year by year. Slowly but surely the requirement to move in all aspects of our lives, is being reduced. So what now looks like 5,000 steps as a total should really be 5,000 steps over and above the background, and as I said, the background is slowly being eroded away. It can be a bit misleading for people who rely on pedometers to achieve their 10,000 steps. To put it into perspective there was a paper I read a couple of months ago about the Amish communities in America. it was a great paper, and those people were averaging around 18,000 steps a day. We know we can't turn back the clock of course, but those traditional sorts of daily activities had some people getting over 50,000 steps a day. The point is, in our lives we now typically sit behind a desk and computer screen. If we think we can get to 10,000 steps and the rest of the day we can sit there at one MET - for me that's about one and a half METS because I've measured - for six and a half hours!, then we are fooling ourselves. So this question is easy to answer if all of the background activity stays constant, but the fact that it's being eroded means our need to move more is being increased, making it a very difficult question to answer.

Ed: Adrian, what is your take on the 30-minute-a-day message versus the accumulated physical activity message - not so much the 10,000 steps-a-day program?

AB: Firstly the epidemiological evidence for health benefits can be drawn from epidemiological studies that have either measured cardiorespiratory fitness or have measured leisure time physical activity. The evidence supporting the 30 minute minimum threshold comes from the measured-time approach. No-one had actually measured all the other steps that people take - the basal 4,000 to 6,000 that you've been talking about and now on to which we want to graft or add the 10,000 as a recommendation. So that's where that fits. The second part of your question about accumulation is also something that's been widely discussed, but with only a relatively small number of studies in terms of control trials in clinical populations or clinic settings where it seems that people can get the same cardiorespiratory training effects from short bouts of activity as short as 8-10 minutes. There have been only a few studies: a study in Japan, another study in England or Northern Ireland with 22 Irish female medical students.

With these relatively few studies we may be pushing the accumulation idea a little ahead of the evidence, but it's a good idea from a health promotion perspective because it'll do no harm.

If we can recommend things that encourage sedentary people to do even 10 minutes of daily activity, that's a start on the road to 30.

Ed: Thanks Adrian. Adults or kids? Wendy, let's start with you. Where should we focus our efforts in promoting physical activity? Evenly, or one group or another? What's your feeling on that?

WB: Well, Kevin mentioned the Amish community who are already doing 18,000 steps per day on average with some doing many more. If you put pedometers on children in Australia today you'll find the younger ones are doing around 15,000 steps a day, and the early teens are doing about 13,000, so they are pretty active. I spent most of the time of my life when I was a mother of young children, trying to keep my two boys still. All they needed was space! On the other hand the prevalence of sufficient physical activity is much, much lower in middle age. And it's directly related to obesity. More than 66% of middle age men now have a BMI greater then 25. And this group is part of the now infamous 'baby-boomer' generation. If we don't activate this group now, then in 20 years time there are going to be epidemics of a multitude of chronic diseases which are related to inactivity and over-weight and obesity. I think middle-aged men should be the focus of our attention right now.

Ed: Kevin, adults or kids: where do you think we should focus?

KN: I tend to get a bit frustrated with adults to be honest with you, so my recommendation would be that we focus more on kids. The fact is that the tracking data show quite clearly that we know that the over-weight kid, in all probabilities, is going to become an over-weight adult. I think we've almost got to accept that we've missed a generation. It's happened pretty quickly. You know the last 20 years has been an epidemic when you look at the trends and rate of change in obesity over that period. For example, obesity in adults is changing at more then 200 times the rate of the evolution of human height. That in itself has been pretty quick to change over the last 150 years. So we've never seen anything quite like this. I think it's virtually impossible to halt that within adults and I think with kids we've got a better opportunity. I think we've got to get more control over the sorts

of environments that we create for kids. I don't think we can focus just on providing physical activity. I think we've got to promote less sedentary activities as well. Of course we can't forget about any population group, but we should work with children first and foremost in the hope that we have a major impact that will carry through to the next generation of adults.

Ed: Adrian, I'm not really forcing us to choose either/or but, adults or kids, where do you think we should focus?

AB: The greatest savings, from an economic-rationalist standpoint that most governments would subscribe to, can be achieved by getting adults active, particularly middle aged adults, as Wendy suggested. So I'd put immediate dollars into that now if there is going to be a political imperative to address inactivity. The politicians have gotten the story around the wrong way if they really want to save money in "political time". However, I agree with the children argument if we are looking at the long-term. Because they are going to turn into young adult diabetics at an exponentionally-increasing rate and are likely to develop chronic diseases earlier, we may well face the peculiar situation of the baby boomers outliving their children. That's a cause for real concern. The only problem I have is I don't know of a single population-generalisable intervention to increase physical activity in kids that really works that I could recommend and that the system could afford. I agree with the notion of reducing sedentary time for children as the best way to go.

KN: Well, can I just add, there is one in Singapore. It's a little bit unusual and quite military, but there is one that's worked very nicely and there are several papers published in that population. The intervention is school-based but it does involve families and diet and physical activity and has been shown to work. But it has pretty severe penalties for the schools and individuals, in a sense preparing them for military training when they get older.

Ed: For the concluding question, we'll turn it over to you, Wendy. It is always hard to boil something down to its essence but what single change would you like to see in Australia to assist in the promotion of health-related physical activity?

WB: Banning cars from all the central business districts and returning the cities to the people. You should only be able to take your car to a car park at the edge of the city or town centre and then continue to walk to wherever you are going - except for people who cannot walk, who would have a bus or something. It's happened already in Oxford, in Rome, and I think in six other European cities. The rates of walking and cycling are increasing in those places.

Ed: So China will soon be an interesting case study because they are now banning bicycles from the city centre and allowing cars.

AB: There is already a published paper from China which shows that cities which have urbanised and developed freeways are finding obesity rates rising far faster than in cites where bicycles are still prevalent.

Ed: Kevin, what single change would you like to see to increase health-related physical activity in Australia?

KN: Well I'd like to see some activity in schools which would formalise, and make mandatory, the sorts of recommendations that we currently see across the States for the number of minutes or hours per week that children receive physical instruction or physical education. One thing that encourages me is that over the last 20 years, in fact longer than that, there have been many repeat studies of kids where they have been asked what they think about physical activity and sport, and in every single one that I can find, at least 80% of kids say they enjoyed sport, they enjoyed physical activity. I think that gives us great encouragement to say that's the environment where we should be able to present something really interesting, some quality physical education experiences. I like that approach, to get kids active in an environment that's safe and fun, and that's really what they want. So, for me, I would like to see schools, communities around schools, and certainly the governments to get involved to ensure that they deliver on what they recommend; to mandate that sort of activity, not regimented like the Singapore models, but in ways that encourage kids to be active during the day at school, including outside of school. It should be fun while expending a fair bit of energy, not just the 10 minutes of activity during a 50 minutes session.

Ed: Thanks. Kevin. Adrian, it's not by accident that I've given you the last word here, because it strikes me that you didn't get the last word in the debate so fair's fair. What's your call on this, what's the single thing you'd like to see changed in Australia to promote physical activity?

AB: The single thing is to get the advocacy influencing the funding that physical inactivity deserves as a risk factor. So from within health alone, ignoring even the other sectors where physical activity has a role, I'd like to see the health budget fund physical activity interventions commensurate with its contributions to the burden of disease. And therefore to get as much money as tobacco and certainly get more money then illicit drugs and alcohol prevention programs. And, if we saw that, we'd be able to enact both the programs we need and start to develop through advocacy the policies that are needed to change the environments we live in which cover both of the earlier comments.

Ed: Well, that's fantastic. Thanks to each of you for your insight and opinion on the issue. I look forward to future discussion in the area, and would like to entertain some response from our readers.

Missed time through injury and injury management at an NRL club

By John Orchard
Medical Officer, Sydney Roosters NRL team, 1998-2003

Introduction

Rugby League is one of Australia's foremost team sports, for which limited injury surveillance data have been published in the past[1-8]. Most of these reports have included data from a single team or small number of teams, rather than surveillance of an entire competition. Future injury surveillance should be aimed encompassing a large number of teams such as all teams in the Nation Rugby League (NRL) or British Super League competition, as is done in football competitions such as the Australian Football League (AFL)[9] and premier league soccer[10]. However, it is likely that such surveillance will focus on injury incidence (and trends in incidence between years and teams) rather than injury prevalence and management[7, 11]. A combined analysis of the previously published Rugby League epidemiology papers reported an average injury incidence of 40.3 injuries per 1000 player hours[7]. It was also reported that most Rugby League injury surveys defined an injury as a condition which causes a player to miss a subsequent competition match, although not all surveys limited the definition in this fashion, and those that had a broader definition led to much higher injury rates[7].

Methods

The aims of the study were to provide information about missed playing time through injury, risk factors for injury and management of injuries at a single NRL team. The methods used for data collection were based on those used for AFL injury surveillance, which have been described previously[9].

The focus of the paper will be on injuries which have caused a player to miss a subsequent game, and more particularly the number of games missed through injury. The scope of the study was the highest two grades of team at the Sydney Roosters NRL club (NRL grade and NSWRL first division, both of which are open age) over the six winter seasons 1998-2003 inclusive. Junior competition matches were not included. The number of players used in the senior squad each year is indicated in Table 2, which is used as the basis to calculate injury prevalence.

Injury prevalence is a measure of the number of people suffering from a condition at any given time. It is quite commonly reported in general medical studies but rarely in sporting injury papers[11]. In a sporting context, the injury prevalence (or point prevalence) can be reported in reference to the proportion (percentage) of players who are unable to compete (play) in matches due to injury, if the definition of an injury is one that causes a player to miss matches[9, 13].

For the comparison of injuries by player position, a player was defined as being either a forward (prop, hooker, second rower, lock), back (centre, winger, fullback) or a half/utility (halfback, five-eighth, or player who often played in multiple positions).

The injury definition was varied for a component of this study to assess player risk of successfully completing a game with injury. Assessment of risk was only performed for the NRL grade over four seasons (2000-2003). The definition for an 'at risk' player was one having his first match back from missing games through injury, or one who was injured in the previous week and required testing of his fitness prior to that game. An unsuccessful risk was one where the player had a recurrence of the injury and was forced either to leave the field due to this injury, or miss a subsequent game due to this injury after the match. All other outcomes were considered successful with respect to that risk.

The number of players requiring surgical operations was also tallied. This included players who were operated on for injuries that did not cause matches to be missed through injury. It only included surgical procedures performed in hospital and not those at the clinic or playing field, such as suturing of lacerations.

For injuries which occurred during matches (and which caused a subsequent match to be missed),

multiple comparisons were made between risk of injury under various match conditions. The comparisons were by grade (first versus reserve grade), time of match (night versus day), temperature (warm versus cool), rain (dry versus wet), home versus away games and, for first grade matches, wins versus losses. The weather conditions were recorded subjectively on the day of the game. The comparisons between groups were analysed using incidence density ratios with 95% confidence limits expressed. These were calculated using a Taylor series expansion, which suits the format of data and tends to give conservative (wide) confidence limits compared to other methods[12].

The formulae used to compare the injury rates in two groups with a Taylor series expansion are as follows:

Relative risk (incidence density ratio) (RR) for condition 1 compared to condition 2 = Injury rate under condition 1/Injury rate under condition 2.

The 95% confidence intervals for relative risk were calculated using a Taylor series expansion (formulae shown in Figure 1).

Results

Table 1 lists the number of missed games by diagnostic category for the six seasons, whereas Table 2 provided a round-by-round tally of players unable to play through injury. An average of 6.5 players are missing from the top two grades (14% of the player list) during the regular season, with the first six rounds being slightly below average. In the finals this figure drops to 4.3 players per week

Figure 1 – calculation of relative risk and confidence intervals

$$RR = \frac{\text{injuries}_{condition1} \text{ x player matches}_{condition2}}{\text{player matches}_{condition1} \text{ x injuries}_{condition2}}$$

$$95\%CI = RR \text{ x } \exp\left(\pm 1.96 \text{ x } \sqrt{\left(\frac{1}{\text{injuries}_{cond1}} + \frac{1}{\text{injuries}_{cond2}} + \frac{1}{\text{playermatches}_{cond1}} + \frac{1}{\text{playermatches}_{cond2}}\right)}\right)$$

Table 1 – Missed games in first and reserve grade by category (1998-2003)

BODY AREA	BODY CATEGORY	2003	2002	2001	2000	1999	1998	TOTAL	AVERAGE
Head/neck	Concussion	7	3	1		1	1	13	2.2
	Facial fractures		6	6	15	6	2	35	5.8
	Neck sprains	1			1	2		4	0.7
	Other head and neck injuries			1	1			2	0.3
Shoulder/arm/elbow	A/C joint injuries	7	2	2	5	2	2	20	3.3
	Shoulder sprains and dislocations	34	41	4	4	11	6	100	16.7
	Other shoulder/arm/elbow injuries	17	1	2	19	8	1	48	8.0
Forearm/wrist/hand	Forearm/wrist/hand fractures		1	5	3	2	39	50	8.3
	Other forearm/wrist/hand injuries	6	1	2	5	1		15	2.5
Trunk/back	Lumbar and thoracic spine injuries	1	11	6	5		2	25	4.2
	Rib and chest wall injuries	10	9		8	8	2	37	6.2
	Other trunk/back/buttock injuries		2			2		4	0.7
Hip/groin/thigh	Groin strains and osteitis pubis		5	12		6		23	3.8
	Hamstring strains	13	7	7	19	3	1	50	8.3
	Thigh and hip haematomas	1	1	2	5	4	9	22	3.7
	Quadriceps strains	1	4	2	7	5	8	27	4.5
	Other groin/hip/thigh injuries		1	1		15	2	19	3.2
Knee	Knee ACL	13	49		3	19	23	107	17.8
	Knee cartilage	4	11	22	5	8		50	8.3
	Knee MCL	14	13	11	4	6	14	62	10.3
	Knee PCL		7	7			1	15	2.5
	Other knee injuries	19		6		5	1	31	5.2
Shin/ankle/foot	Ankle sprains or joint injuries	8	16	12	16	2	4	58	9.7
	Calf strains		1	1	4			6	1.0
	Leg and foot fractures		1	30		1	6	38	6.3
	Leg and foot stress fractures	23	5				22	50	8.3
	Other leg/foot/ankle injuries	4	6	3	15	3	5	36	6.0
Medical illness	Medical illnesses	2	1	1		3	2	9	1.5
TOTAL		185	205	146	144	123	153	956	159.3

Table 2 – Players missing through injury (first and reserve grade) by week

ROUND	2003	2002	2001	2000	1999	1998	AVERAGE
1	9	4	4	4	5	5	5.2
2	8	5	3	6	3	5	5.0
3	8	6	5	6	6	7	6.3
4	10	7	4	7	7	6	6.8
5	6	11	4	4	5	7	6.2
6	9	8	5	5	6	4	6.2
7	8	10	7	5	5	5	6.7
8	7	8	7	4	6	7	6.5
9	7	10	7	7	5	6	7.0
10	10		3	6	5	8	6.4
11		12	6	4	4	10	7.2
12	8	8	4	5		5	6.0
13	5	11	5	5	4	4	5.7
14	7	8	6	7	5	4	6.2
15	5	5	5	9	8	6	6.3
16	8	7	6	5	5	4	5.8
17	10	10	7	5	6	5	7.2
18		11	8	4	4	7	6.8
19	7	11	6	5	2	8	6.5
20	7		6	5		10	7.0
21	8	4	6	6	4	8	6.0
22	8	7	6	7	5	7	6.7
23	9	9	7	7	5	7	7.3
24	8	10	5	6	3	8	6.7
25	6	11	9	5	6		7.4
26	7	12	5	5	9		7.6
H&A	185	205	146	144	123	153	6.5
Finals 1	5	4	6	4	6	4	4.8
Finals 2		3		5	8	4	5.0
Prelim	4	3		5		3	3.8
Grand F	4	1		6			3.7
Finals	13	11	6	20	14	11	4.3
Total	198	216	152	164	137	164	171.8
Rounds	27	28	27	30	26	27	27.5
Week av.	7.3	7.7	5.6	5.5	5.3	6.1	6.2
Players	49	48	46	43	41	43	45.0
Prevalence (H&A)	15.7%	17.8%	12.2%	12.9%	12.5%	14.8%	14.4%
Prevalence (incl finals)	15.0%	16.1%	12.2%	12.7%	12.9%	14.1%	13.9%

Table 3 – Injury prevalence by player position

	INJURY CATEGORY	BACKS	FORWARDS	HALVES/ UTILITIES
Head/neck	Concussion	0.2%	0.3%	0.1%
	Facial fractures	0.9%	0.3%	0.4%
	Neck sprains	0.1%	0.0%	0.1%
	Other head and neck injuries	0.0%	0.0%	0.1%
Shoulder/arm/elbow	A/C joint injuries	0.1%	0.3%	0.6%
	Shoulder sprains and dislocations	0.4%	1.3%	0.0%
	Other shoulder/arm/elbow injuries	1.5%	1.5%	1.5%
Forearm/wrist/hand	Forearm/wrist/hand fractures	0.4%	1.3%	0.0%
	Other forearm/wrist/hand injuries	0.0%	0.4%	0.1%
Trunk/back	Lumbar and thoracic spine injuries	0.4%	0.5%	0.0%
	Rib and chest wall injuries	0.2%	0.8%	0.5%
	Other trunk/back/buttock injuries	0.1%	0.0%	0.1%
Hip/groin/thigh	Groin strains and osteitis pubis	0.6%	0.2%	0.3%
	Hamstring strains	0.8%	0.7%	0.9%
	Thigh and hip haematomas	0.2%	0.4%	0.4%
	Quadriceps strains	0.3%	0.2%	1.1%
	Other groin/hip/thigh injuries	0.7%	0.1%	0.1%
Knee	Knee ACL	2.3%	1.0%	1.9%
	Knee cartilage	0.9%	1.0%	0.0%
	Knee MCL	0.8%	1.2%	0.6%
	Knee PCL	0.3%	0.3%	0.0%
	Other knee injuries	0.3%	0.7%	0.1%
Shin/ankle/foot	Ankle sprains or joint injuries	1.1%	0.8%	0.8%
	Calf strains	0.0%	0.1%	0.1%
	Leg and foot fractures	1.1%	0.0%	1.0%
	Leg and foot stress fractures	1.2%	0.8%	0.0%
	Other leg/foot/ankle injuries	0.5%	0.8%	0.0%
Medical illness	Medical illnesses	0.2%	0.1%	0.1%
All injuries		15.7%	15.2%	10.8%

Table 4 – Risks taken by diagnosis (with success rates) for seasons 2000-2003 inclusive

BODY CATEGORY	SUCCESSFUL	NOT SUCCESSFUL	% SUCCESS
Concussion	12	0	100%
Facial fractures	4	0	100%
Neck sprains	3	0	100%
Other head and neck injuries	5	0	100%
Medical illnesses	9	0	100%
A/C joint injuries	10	1	91%
Elbow sprains or joint injuries	2	0	100%
Other shoulder/arm/elbow injuries	7	0	100%
Shoulder sprains and dislocations	17	1	94%
Forearm/wrist/hand fractures	9	2	82%
Other forearm/wrist/hand injuries	8	0	100%
Lumbar and thoracic spine injuries	11	4	73%
Other trunk/back/buttock injuries	1	1	50%
Rib and chest wall injuries	25	3	89%
Groin strains and osteitis pubis	12	1	92%
Hamstring strains	25	3	89%
Other groin/hip/thigh injuries	7	2	78%
Quadriceps strains	11	2	85%
Thigh and hip haematomas	13	1	93%
Knee cartilage	2	0	100%
Knee MCL	13	0	100%
Other knee injuries	6	0	100%
Ankle sprains or joint injuries	11	1	92%
Calf strains	6	0	100%
Leg and foot stress fractures	4	0	100%
Other leg/foot/ankle injuries	20	2	91%
All injuries	253	24	91%

Table 5 – Operations over last six seasons

OPERATION TYPE	OFF-SEASON	PRE-SEASON	IN-SEASON	TOTAL	PER SEASON
Knee arthroscope	9	1	5	15	2.5
Shoulder arthroscope (not A/C joint)	6	0	1	7	1.2
Ankle arthroscope (+ related procedures)	9	1	2	12	2.0
Elbow arthroscope	1	0	0	1	0.2
Wrist arthroscope	1	0	0	1	0.2
Knee reconstruction	1	2	8	11	1.8
Shoulder reconstruction	9	0	2	11	1.8
Fracture fixation	0	1	15	16	2.7
Groin surgery (adductor tenotomy +/- conjoint tendon repair)	13	2	2	17	2.8
Wrist/finger reconstruction	2	1	1	4	0.7
A/C joint operation	5	0	0	5	0.8
Other procedures	14	4	10	28	4.7
Total surgeries	70	12	46	128	21.3
Total per player per season					0.41

Upper limb injuries constituted 24.4% of missed playing time, trunk injuries 6.9%, head and neck injuries 5.6% and medical illnesses 0.9%. Lower limb injuries accounted for the majority of missed playing time (62.1%) being made up of knee injuries (27.7%), shin, foot and ankle injuries (19.7%) and groin, hip and thigh injuries (14.7%).

Review of time missed through injury by position (Table 3) shows that backs and forwards miss a similar amount of playing time through injury, with halves and utilities missing significantly less time. Forwards missed more time with upper limb fractures, rib injuries and knee medial injuries, whereas backs miss more time with groin injuries, knee ACL injuries, ankle sprains and lower limb fractures (all $p<0.05$).

Table 4 shows that, for instances where players took injuries into NRL grade games that were thought to be at risk, the vast majority successfully completed the game (91%). There is no specific injury where this process appeared to be flawed with an unacceptable success rate. The most susceptible injuries to recurrence are back injuries, rib injuries and hamstring and quadriceps strains.

Review of surgery for the six seasons (Table 5) shows that, for every 10 senior listed players each season, there are four operations. The majority of these operations are in the off-season. There was no one operation type which stood out as being overly performed. (Knee arthroscope, ankle arthroscope, knee reconstruction, shoulder reconstruction, fracture fixations and groin surgery roughly accounted for 10% of total surgeries each.)

As there were slightly fewer than 50 senior listed players per season, the percentage risk of each player requiring each type of surgery per season can be calculated by doubling the number of procedures per season. Therefore the risk for each player requiring a knee reconstruction or a shoulder reconstruction each season is roughly 4% each respectively.

Six year review of weather and ground conditions and injury (Table 6) showed no significant correlations, although there were trends towards more injuries in day games (compared to night games), in losing matches (compared to winning matches) and in warm weather (compared to cooler weather). There were minimally fewer injuries at home (at Aussie Stadium) compared to away matches. Home ground curators were encouraged to provide conditions shown to possibly be associated with injury reductions (softer surface, rye grass surface, less thatch etc.)[20].

Match injury incidence can be calculated overall from the figures of 198 injuries (that caused missed matches) arising in 289 matches. Using an exposure of 13 players per match and the match time of 80 minutes, each match constituted 17.33 player hours. Therefore the match injury incidence from this study is 39.8 injuries per 1000 player hours.

Table 6 – Relationship between weather and match conditions and injury

GRADE	MATCHES	INJURIES	INJURY RATE	INCIDENCE DENSITY RATIO	LOW 95% CI	HIGH 95% CI
NRL	159	106	0.67			
First division	130	92	0.71	1.06	0.80	1.41
Total	289	198	0.69			

TIME	MATCHES	INJURIES	INJURY RATE	IDR	LOW 95% CI	HIGH 95% CI
Night	119	68	0.57			
Day	170	130	0.76	1.34	0.99	1.81
Total	289	198	0.69			

WEATHER	MATCHES	INJURIES	INJURY RATE	IDR	LOW 95% CI	HIGH 95% CI
Raining	45	28	0.62			
Dry	244	170	0.70	1.12	0.74	1.69
Total	289	198	0.69			

WEATHER	MATCHES	INJURIES	INJURY RATE	IDR	LOW 95% CI	HIGH 95% CI
Warm	89	69	0.78			
Cool	200	129	0.65	0.83	0.62	1.12
Total	289	198	0.69			

GROUND	MATCHES	INJURIES	INJURY RATE	IDR	LOW 95% CI	HIGH 95% CI
Home	151	99	0.66			
Away	138	99	0.72	1.09	0.82	1.46
Total	289	198	0.69			

RESULT	MATCHES	INJURIES	INJURY RATE	IDR	LOW 95% CI	HIGH 95% CI
Win	97	58	0.60			
Loss	62	48	0.77	1.29	0.87	1.92
Total	159	106	0.67			

Discussion

As can be seen from Table 1, there is a definite element of randomness to the injury profile each year. The team has suffered bad 'runs' of upper limb fractures (1998), knee ACLs (2002) and shoulder injuries (2002-03) at various stages.

There are fewer players missing through injury during the finals series than in home and away matches. Part of this difference may be attributed to more aggressive strategies at keeping players on the field during the finals, with the knowledge that they can rest as soon as the season finishes. The NRL team competed in the finals in every year of this study, which presents a bias that may mean that results are not reflective of the NRL competition as a whole. Teams which are not likely to make the finals may be less aggressive in their techniques to return players to the field in the second half of the season than teams which are likely to make the finals. Part of the difference in approach may be reflected in use of local anaesthetic injections to allow players to compete. These injections are legal in the NRL competition, in contrast to international Rugby Union. This topic has been substantially reviewed, using data from this team[17, 18]. The injury prevalence for the team would no doubt be higher if these injections were not used.

Review of the past six years shows that backs and forwards miss a similar amount of playing time through injury, with halves and utilities missing significantly less time. The results from this study regarding injury prevalence and position are

comparable with previous studies comparing forwards to backs(1, 4, 6, 8, 21). In previous studies halves would have been considered backs, although it is not clear how the 'utility' player would have been categorised (eg, interchange player who covers both five-eighth and lock, or halfback and hooker). These previous studies have shown that forwards suffer slightly more injuries overall than backs, but with more contact and upper body injuries. Backs generally suffer more non-contact lower limb injuries, particularly in drier weather conditions, which often lead to more missed playing time. The injury profile of a Rugby League back is more similar to that of an AFL player[21].

Review of the process for determining fitness to play shows a high rate of players being able to complete games successfully when taking an injury into the match (91%). These results regarding injury risk suggest that the mechanisms for determining which players are fit to play have been sound. At the Roosters this mechanism generally involves medical staff giving their opinion on the fitness of the player, but for many injuries with a good long-term prognosis the coach (+/- player himself) will make the final decision on team selection, which is essentially one of risk management[15, 16]. An absolute exception to this is any circumstance where the injury carries possible severe consequences, such as concussion or return to play after reconstructive surgery, in which case the doctor has a right of veto.

Prevalence (which reported here is a reflection of time missed through injury) is a very valuable measure as it measures the total 'impact' that injuries have on causing players to miss games. Injuries that are comparatively uncommon but have serious consequences, such as knee anterior cruciate ligament tears, are under-represented in studies which report incidence only. Prevalence is proportional to incidence multiplied by severity. The criterion in the common definition of an injury in Rugby League that it must have caused a player to miss a match tends to exclude many 'injuries' such as minor concussions, lacerations, haematomas, dislocated fingers and any injuries which can safely be injected with local anaesthetic to allow continued participation. Some injuries that would be considered 'significant', such as a player who was concussed and carried off on a stretcher but who returned to play the following week, are excluded by this definition. Injuries which cause players to leave the field have actually decreased since the institution of a recent rule change to limit teams to 12 interchanges per match[14]. The inclusion of such 'minor' injuries in a definition of a standard injury tends to make it very difficult to compare results between studies[9]. The 'missed game' threshold is the most objective across different teams and competitions in a sport such as Rugby League, where matches are consistently played once a week per team. The overall injury incidence in this study (39.8 match injuries per 1000 player hours) is very similar to the pooled injury incidence reported by a previous analysis (40.3 injuries per 1000 player hours)(7).

Review of surgical procedures shows that for every 10 senior listed players each season, there are 4 operations, which is a very high rate of surgery. The majority of these operations are in the off-season. Previous review of surgery in the AFL competition has shown a similar rate of surgery, which a higher rate of knee arthroscope and groin surgery in AFL players but a lower rate of shoulder reconstruction and fracture fixation, compared to NRL players[19].

Review of weather and ground conditions and injury showed no significant correlations, although there were trends towards more injuries in day games (compared to night games, RR 1.34, 95% CI 0.99-1.81), in losing matches (compared to winning matches) and in warm weather (compared to cooler weather).

Ideally in the future, the NRL should administer a central injury surveillance system and publish annual results. In this scenario, these presented results can be compared to other clubs, and trends can be analysed with greater numbers of injuries, with the ultimate aim of competition-wide injury prevention.

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Boxing medicine

The 40-year view of a master in the field

By Paul McCrory

Boxing – Medical Aspects

Unterharnscheidt, F & Taylor-Unterharnscheidt, J

Academic Press, Elsevier Science, 2003. (796 pages)

ISBN: 0-12-709130-0

This is a fascinating book to read and an even harder one to review. Within the field of boxing medicine, the name of Freidrich Unterharnscheidt is well known. He is a US board-certified neurologist and neuropathologist, who has spent his life studying and publishing in this area. This book therefore, in a very real sense, represents his life's work as it summarises the various lines of research that his career has taken him.

He is also unique in so far as he has published on this topic in both the German and English literature. This provides him with an exceptional ability to integrate the European and US literature in a way that no existing American textbook can possibly emulate. In an era where American scholarship is synonymous with a MedLine search of the US literature (or worse still, a Google search of the term 'boxing'), this book is a gem.

It has taken him over 40 years of research to reach this point and the book will remain as one of the great resources in understanding the medical aspects of this sport. In providing the historical perspective and a breadth of clinical topics it outstrips the older multi-authored boxing texts such as those by Barry Jordan and Bob Cantu [Cantu, 1995 #57; Jordan, 1993 #52].

Delve into almost any part and realise that there is a lot more to boxing than two blokes punching the living daylights out of each other. For example, have you ever pondered why woodpeckers are not punch drunk or why a boxer can be felled by a blow to the stomach or chest just as easily as to the head? The answers lie somewhere within the 800 pages of this monumental tome.

This book is therefore a good starting point for anyone with more than a passing interest in boxing. I say a starting point because it largely represents one man's view of this area. This, in itself, is both a strength and weakness. Unlike multi-author texts, this book does suffer from the weakness that it is difficult for a single person to keep up with the breadth of current literature across this field. For example, there are relatively few references cited from the last five to seven years.

In addition, some of the areas that are currently topical lack the perspective that a wider understanding of neurotrauma can bring.

Unterharnscheidt devotes quite a long discussion to Barry Jordan's 1996 work on ApoE and chronic brain injury, yet ignores the far wider recent published work on how this genotype affects the outcome of all levels of traumatic brain injury, whether cased by boxing or otherwise. Furthermore, he fails to even acknowledge the ethical issues raised by whether individual boxers should be tested for this genetic risk factor. There are also striking deficiencies such as the total absence of a chapter on neuroradiological changes in boxers. In certain jurisdictions worldwide, annual or semiannual MRI brain scans are mandated, yet we have no discussion at all on this topic, though there is a long chapter on EEG changes, a technique that most neurologists have long abandoned as having little use in this setting.

There are some aspects of this book that do cause concern.

For example, there are case descriptions of boxers said to have chronic brain injury from boxing. The most recognisable commentary is on Muhammad Ali, where his Parkinsonian condition is described as being boxing-related. The description is largely based on media reports or comments from boxing promoters rather than the official medical reports from the Mayo Clinic in 1980 and Columbia-Presbyterian Medical Centre in 1984 where it was clearly stated that he was not suffering from a boxing-related neurological condition and that his neuroimaging and psychometric studies were essentially normal. In a textbook such as this one, this mistake is disappointing and detracts from the veracity of other descriptions.

But this is nitpicking. My biggest disappointment in the broader debates on boxing is the lack of scientific rigor that is brought to the boxing debate.

It is not unusual to hear figures of anywhere between 20%-60% of chronic CNS abnormalities ascribed to professional boxing, yet few of these people would realise that the boxers studied in those cited papers commenced their sport more than 100 years ago in the twilight years of the 19th century. It is not too great a leap of understanding to appreciate that boxing has changed since that time and that a better appreciation of the current literature would be worthwhile. This book should be compulsory reading for anyone who wants to comment publicly on the boxing debate.

My biggest problem with this book is the lack of critical appraisal of some of the early seminal papers on chronic boxing injury. This issue in many ways underpins the whole debate on boxing and we need to be cogniscent about the limitations that published papers have.

The first use of the term 'punch drunk' was by Harrison Martland [Martland, 1928 #334] in 1928 where a boxing promoter told him of a number of ex-boxers who were in lunatic asylums. The only case he clinically described was one of Parkinson's disease, not punch drunk syndrome. Although the term caught on quickly, the condition remained firmly anecdotal in nature until Roberts in 1969 performed a study on 250 retired boxers where 17% had clinically demonstrable lesions of the nervous system [Roberts, 1969 #384].

At the same time and in the same city, John Corsellis, a highly regarded neuropathologist, described the pathological accompaniment of that punch drunk condition [Corsellis, 1973 #165]. What is now widely accepted as the hallmark cerebral changes of this condition was based upon the brains of just 12 professional boxers, many of whom had little information about their previous boxing career and all of whom fought before 1940.

What stands out even to the casual reader is the dramatically high exposure where many of the boxers had more than 1,200 professional fights in their careers. This degree of boxing longevity is unheard of in this day and age. In Victoria, the current data from the Professional Boxing and Combat Martial Arts Board suggest that fewer than 3% of registered professional boxers will have more than 10 fights in their careers. It is probable that for this reason alone it is unlikely that the 'punch drunk syndrome' as it was described last century will be seen in the future.

It worth noting that boxing in the era studied by these early workers is different to boxing today for a number of reasons. As mentioned above, the striking difference is the extreme exposures involved. Boxers' careers in the 1930s to 1950s generally lasted 10-20 years and started in childhood. They often had up to 1,000 professional fights in their career. Many boxers also become professional sparring partners or tent/booth boxers having up to 30-40 unsupervised bouts per day for many years on end. Many professional fighters also had long amateur careers before turning professional. Fighters were not matched by skill or weight, had no medical supervision and fought with 6 oz gloves. There was a decreased willingness to stop bouts, even when a boxer was overmatched, as well as increased bout duration (up to 2 min x 20 rounds). Furthermore, there was no mandatory exclusion following a knockout or head injury. Because of the depression in the 1930s, financial reasons kept many boxers competing for longer and longer careers despite the documented onset of neurological symptoms.

The difficulty that these studies now raise is just how relevant they are to boxing as it is practiced in 2004.

The lack of critical appraisal of this early work is a significant flaw in this book. The corollary of this relates to the future prevention of chronic injuries. This area is not discussed at all and yet most administrative and regulatory authorities spend much time and effort to these ends.

Overall, what can I say about this book? For the researcher or clinician with a strong interest in this area, it is $350 well spent. Unterharnscheidt gives a unique historical perspective of boxing medicine and covers much of the clinical information that will not be found elsewhere. There are anecdotal observations and comments about boxing technical issues that only a true aficionado can appreciate. This book is written by a master in the field. The limitations are that it is but a starting point, and more recent developments and particularly investigative and preventative issues are far better covered by Barry Jordan's book on the same topic [Jordan, 1993 #52]. Why not get both?

To paraphrase Johann Wolfgang von Goethe "Ein Gegenstand, wohl beschaut, schliesst ein neues Organ in uns auf" (An object, well studied, opens a new organ in us).

Associate Professor Paul McCrory, of the Centre for Sports Medicine Research and Education and the Brain Research Institute at the University of Melbourne, is Chair of the Medical Commission, Victorian Professional Boxing and Combat Sports Board

The physics of unraisable body

Ki/chi development in Aikido

By Daniel James

Central to the techniques of internal martial arts such as aikido are the concepts of Ki and liberal use of the word is made in the martial, philosophical and spiritual senses. This article compares the paradigm of Ki with the paradigms of physics for performing the various techniques of aikido and investigates a popular Ki development exercise. It does not deal with the philosophical and spiritual aspects of Ki, although their development can be considered an important and integral part of the art.

The culture of Ki

An initial aikido class often introduces students to the concept of Ki and its application to aikido as well as their daily lives, explanations ranging from the overtly religious to the physical such as the momentum of an opponent. There are many different styles of aikido, some placing more emphasis on Ki development than others, which may be a reflection of different interpretations of Ki.

The concept of Ki is Japanese, and is more easily interpreted in the context of the roots of Japanese society. Ki pervades many aspects of traditional Japanese society, though to non-Japanese people it is sometimes something of a struggle to grasp conceptually. Tohei[1] has defined it as "cosmic power" and states that "Ki is a very complex word… and even more difficult to translate to Westerners". Westbrook and Ratti[2] speak of the difficulty of defining Ki in a purely physical or mental sense.

The translation can however be assisted if we look at some words that include the Ki Chinese character as it appears in the calligraphy for aikido. (There are a number of different characters for Ki.) Many Japanese words include this character for Ki which have deeply philosophical meanings. But there are also many that have purely physical meaning. Some examples, together with their accompanying English translation, can be seen in Kenkyusha[3]: denki, sekiyu and kiryoku mean electricity, petrol and force respectively. Whilst this method of translation is somewhat superficial, it demonstrates the generalised use of Ki in Japanese language and society. This is perhaps in line with Tohei 's teaching that Ki pervades all things. By using the physical sciences to examine Ki, we first need to be mindful of the development of science in eastern culture, as there are significant differences to its western counterpart.

The development of science in East and West

The contemporary physical sciences in Japan developed in conjunction with its contact with the West (though this is perhaps an ethnocentric observation). Capra[4] observes that there are important parallels between the two traditions though. Development of the internal mind and philosophies was widely prevalent and advanced in the East well before Western influence[5]. Nakayama reports that the development of the physical sciences in the East previously focused primarily on observation; for example, the observations of the early Chinese astronomers were highly regarded. Discovery of the relationship between cause and effect was seen as less important[5], hence a theory such as Ki could satisfy observable data without discovering causality.

The effects of the Ki paradigm would be well documented therefore but an understanding of how it works would not. This article suggests physics as a suitable alternative paradigm for some of the physical meaning of Ki, and provides an example analysis. This analysis is a non-trivial task, given the complexity of modern physics when used for even simple interactions. To apply modern physics to a physical interaction, a thorough understanding of Newtonian mechanics, mathematics to calculus level and biomechanics is essential. I describe how this might be achieved and provide a simple but popular Ki test called unraisable body as an example. I investigate the appropriateness of basic physics as a tool for understanding Aikido. I describe unraisable body in traditional terms and then translate it into physical terms, suggesting a Newtonian physics-based understanding.

A physical look at the techniques of aikido

A conversational level of ability in physics allows us to describe physical interactions, though to pursue more rigorous solutions is considerably more demanding. Newtonian mechanics[6] allows us to calculate the interaction of simple particles and shapes. Here the position of any point in arbitrary space can be described using three numbers in orthogonal space (x,y,z). To describe this point's movement in space another three components for three axial velocities are necessary. To model the interaction of two people, we would need to describe their position and velocity in space over a period of

time, a considerably more complex task. In this case a mechanics equation is required to describe the motion of each independent part of the body for a given movement.

For example, to represent the motion of a person by describing only the major interconnecting bones, we are dealing with approximately 20 equations using one for each joint of the body. The approach itself is still simplistic in that we are ignoring the complexity of muscle action and reaction on each of the interconnecting bones. Each of these equations would then contain descriptions for position (three variables), velocity (three variables) and acceleration (three variables). If we try to describe interactions over a short period of time (say, a three second aikido technique) and we analyse the motion every 0.01s, we end up dealing with approximately 100,000 unknown variables to compute.

Static analysis of how a variety of joint control and pinning techniques in aikido and other martial arts such as such as the wrist techniques nikyo[7] and sankyo[8] has been described previously. These works present the anatomical basis of these controls but do not describe the interaction of the attacker and defender before or during application of the control. Walker[9] reports in a qualitative but informative investigation on the dynamics of aikido and how physical concepts such as the centre of mass is employed to throw an opponent. However, this article examines a simpler interaction between attacker and defender that is often used to develop Ki power or extension in an Aikido student. It uses basic physics to explain the physical forces developed during this Ki test and how an aikido student manipulates these forces to demonstrate Ki development. The analysis is then validated using experimental results.

Unraisable body

Unraisable body as described by Westbrook and Ratti[2] in their classic aikido text is an exercise performed to aid in the aikido student's Ki development. It is also an essential skill for performing many of the techniques of aikido. The test is also used in other martial arts for developing/demonstrating internal energy.

Figure 1 shows Aikido practitioners A and B trying to raise the student C off the ground by grasping him and lifting through the forearms to his shoulder. For the purposes of this study, Cartesian co-ordinates are used and labelled in the figure. The test is usually repeated a number of times and C is encouraged to experiment with a variety approaches to try and pass the test. Initially C is encouraged to resist the application of the force by using strength, then to completely collapse the body. Finally he is encouraged to calm his mind and extend Ki. This Ki extension is often taught using a number of visual or kinesthetic cues such as flowing of water or sticky feet. Testing of higher-level students is accomplished by varying the severity and suddenness of the lifting force applied. Physical observation of the test shows slight variations in posture when performing the test by resistance and when using Ki, which will be explored below.

The physics of unraisable body

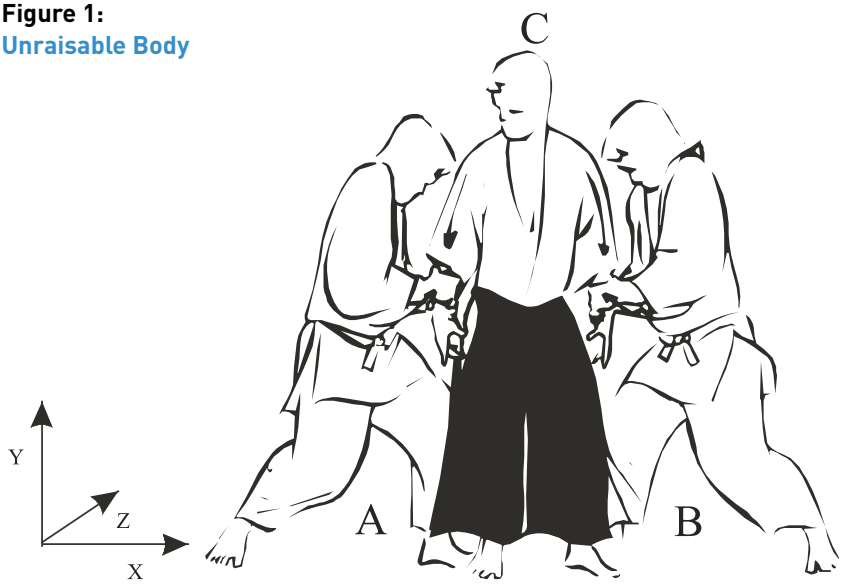
The physical interaction of the student with those trying to perform the lifting described above can be simplified somewhat for the purposes of analysis using physics. In this example, we look at the person to be raised as having completely rigid arms with the only movement available originating at the shoulder joints. Then we examine how this can be extended to include elbow and wrist joint mobility. This simplification enables the applied forces to be resolved into horizontal and vertical components.

Figure 2 depicts the test showing student C lifted by A and B in two ways. Figure 2(a) represents A and B lifting C diagrammatically where the arrows show the direction of the lifting force applied to C. Figure 2(b) depicts the resultant Newtonian force diagram. Here C is represented as 700N (70kg) while A and B apply the tension force (T) at an angle of θ to the horizontal x-axis.

Using basic mechanics the force diagram is resolved into horizontal (x) and vertical components (y). Thus T, the force required to lift the student can be calculated.

Table 1 shows the calculated force (T) that needs to be applied by A and B to lift C. This is calculated for various

Figure 1:
Unraisable Body



angles of lift (θ). The lifting force is represented both in Newtons required to lift and as an apparent mass of C. Notice the dramatic change in forces required as the angle is shifted away from a straight vertical (90^o) lift to a more lateral lift. At angles approaching 0^o, the force required to lift a person approaches infinity, though clearly this angle is not realistic for single joint analysis. Even at a 10^o angle, A and B would need to exert a force equivalent to the mass of nearly six people each, if they were to succeed in raising C.

Clearly if C can vary the angle of interaction with A and B to approach 0^0 degrees, he can become almost impossible to lift. In this position however the arms would appear to be horizontal and the test would look somewhat different from that shown in Figure 1. Nevertheless, this is the fundamental technique for success. In reality the angle of lift can be varied not only at the shoulder joint but also at the elbow and wrist joints. When done correctly, this gives the appearance to an observer of almost no movement by the student, who now appears (and often quite dramatically so) to be unliftable, despite maximal exertion by the lifters.

Table 1:
Force required by A and B to lift an unraisable body C at an angle θ

ANGLE (θ)	FORCE (N)	APPARENT MASS (KG)
90	700	70
80	710	71
70	740	74
60	810	81
50	910	91
40	1090	109
30	1400	140
20	2050	205
10	4030	403
0	Infinity	Infinity

Performing unraisable body

Using the physical explanation above to describe this relatively simple aikido exercise, one can pass the unraisable body Ki test. This is a gradual process best explained (though it is still a simplification of the mechanics) in three steps as depicted in Figure 3(a), 3(b) and 3(c). In each of these cases the direction of lift is shown and the angles of the joints are described using ($\theta_{1\text{-}3}$).

Figure 3(a) represents manipulating only the shoulder joint (θ_1), though using nearly horizontal arms is generally not regarded as mastery of the test. Figure 3(b) involves manipulating the angle of the shoulder joint (θ_1) and elbow joint (θ_2). Notice that the arms are now beginning to resemble a more natural posture and the direction of lift is more horizontal than in figure 3(a). Figure 3(c) demonstrates use of the wrist joint to aid in the redirection of the applied lift to an almost horizontal angle. Even though the applied lifting force is around the wrist joint, movement of the joint enables the direction to be shifted. In many cases the angle of the wrist serves to effect this change by altering the coupling angle for the lift. Hence the wrist can sometimes be pointing downward or even inward, depending on the exact nature of the lifters' grip used to apply the force. When all steps in Figure 3 are implemented, the angular manipulations have become quite subtle and resemble those of a skilled relaxed but powerful aikido student.

The analysis I have just described will enable a student to pass the unraisable body test. It is by no means complete however as it does not describe the dynamic interaction of the three parties during the actual moment of the attempted lift. This is more difficult to describe because a lift is rarely applied instantaneously, nor is it a steady set level of force evenly applied by both lifters.

Three factors can add complexity to the lift. First, C can keep A and B unsettled by manipulating their power transfer both as they prepare and perform the lift. Second, the reactions of A and B as they meet the unraisable body play an important role in the interaction. For example, the horizontal component of the applied force is transmitted between the people attempting the lift. To avoid unbalancing, the other lifter must exert additional force in the horizontal direction, thus aiding the person performing the unraisable body test. Third, if C exerts a slight outward horizontal force, the horizontal component of force will have an additional non-zero term introduced into it. Though this term is small, it is sufficient to encourage an opposing force by A and B and hence can change the angles $\theta_{(1\text{-}13)}$, thus

Figure 2:
Force diagram of an unraisable body (C) lifted by A and B

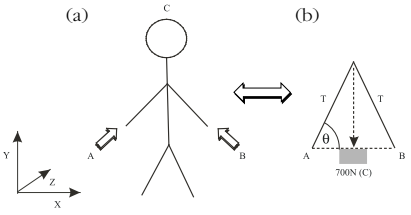
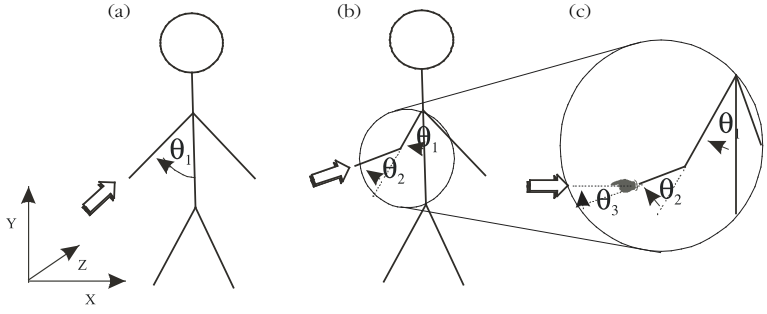


Figure 3:
Force diagram of an unraisable body (C) lifted by A and B



increasing the force required to lift C to approach infinity. A slight horizontal force exerted by A is consistent with the Ki principles of extension.

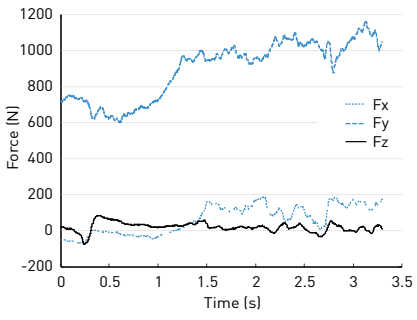
The analysis is not completely rigorous, given the complexity of the dynamic interaction, but it demonstrates how the paradigms of physics can be applied to some of the interactions in aikido training.

In this case, the scientific method of physics demonstrates an alternative understanding of the unraisable body test to that of the Ki paradigm. While a physical understanding of the test is sufficient to enable one to pass it, to master the test requires also developing associated aikido or like motor skills. Using a similar analysis it is possible to demonstrate the principles of unraisable body for when only one person performs the lift (performed by lifting the student under the arms) as well as for other tests, though this is beyond the scope of this investigation. This theory was investigated and confirmed by an experimental investigation.

Results

An experimental investigation into unraisable body was undertaken. In this test, a Kistler force plate was placed under B from Figure 1 when performing the test. The force plate allows the measurement of tri-axial ground reaction forces exerted on the lifter as a function of time. These forces are equal and opposite to those applied to the unraisable body of C.

Figure 4:
Tri axial force plate measurements during an unraisable body lift.



The force plate allowed the forces to be measured in the vertical direction (y), the in plane (x) and out of plane (z) horizontal forces at 1000samples/second. Figure 4 shows the measured forces during a typical attempted lift. Note that the vertical component will measure both the static mass of the lifter as well as the applied lifting force. A lifter stepping on to the force plate triggered the recording to begin the experiment. At time=1s the lift begins and there is no appreciable horizontal component to the force. At time=1.5s, the aikido student is redirecting the applied force. Here vertical force has reached a plateau and there is now an appreciable horizontal component force, this confirming the theory presented above.

Results from several trials were compiled and averaged over the period of time (several thousand data points) in which the lift attempt was made. Both the attempted (unraisable) and successful (normal) lifts were so measured. Table 2 shows the results of a lift on a senior aikido student during a standard lift (normal) and an unraisable body lift (Ki). Clearly, when the student is performing a standard lift, the lifters are exerting force primarily in the vertical direction (y). The average force here is approximately 1100N, which is the mass of a lifter plus half that of the student. When the attempted lift of the student is made (while extending Ki), there are significant horizontal forces generated in the (x) direction ($t = 8.4$, $p < 0.0.001$) and the component force in the vertical direction (y) is reduced to less than that necessary to lift them. This interaction confirms the physical theory described earlier.

Table 2
Forces exerted by a lifter during a standard lift (normal) and an unraisable body lift(Ki).

FORCE / LIFT TYPE	NORMAL LIFT	KI LIFT
Horizontal Force, Fx	9.4N	139.1N
Vertical Force, Fy	1183.1N	960.0N

Conclusions

This article has introduced the concept of Ki as practiced in the traditional martial art of aikido. It presents a cultural basis for its development as a dominant paradigm. Unraisable body, a specific example of Ki development as practised in aikido, is described and an alternative paradigm presented that uses Newtonian physics. The developed paradigm is applied to the unraisable body example in a theoretical and experimental investigation. The results were analysed and demonstrated the validity of this physical model. Though the analysis cannot be generalised across all aikido practice, it nonetheless has demonstrated that some aspects of Ki in aikido can be explained using physics, for examples that are sufficiently simple. It is hoped that by providing a singular example of how science can be used to explain aspects of traditional training, many practitioners may see its value as a tool for learning.

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Acknowledgements
The assistance and use of R.Barrett's biomechanics research laboratory is gratefully acknowledged. The author is also indebted to fellow Aikido students and researchers J.Ward and S.Phillips for their assistance in the experiments and to C. Willis and R.Schlub for editorial comment.

SMA member wins international video award

SMA member Ron Alexander has won the top award in the medical education category of the 2003 Communicator Awards, the American–based international video competition, with his Functional Fascial Taping™ training video.

The organisers say that "the Award of Excellence (Crystal Award) is presented to companies and individuals whose ability to communicate elevates them amongst the best in their field and whose work serves as a benchmark for their industry".

There were 2,867 entries in a number of categories in the 2003 Awards and only 15% managed to win the Crystal Award, including the US Air Force, Indiana University School of Medicine, the University of Nebraska Medical Centre, Boeing and Warner Brothers.

Ron's award-winning video was made not only to reinforce the course content covered in the FFT™ Level 1 workshop but also to show aspects of learning that cannot be covered in the workshop setting. He says that It broke away from the normal video training format -- presenter and plinth or workshop – to use a variety of situations and locations.

For example, it used real cadaver footage to illustrate the anatomy, pathophysiology and theory sections. It created animations, one of fascia from a microscopic image 6000Xs, another of nociceptors, and one of the connective tissue of the mid-thigh generated from 170 MRI scanned images from the National Library of Medicine's Visual Human Project created by Jeffery Linn (USA, Advanced Certified Rolfer). The animation is in both colour and black and white to depict most effectively the 3D mesh-like structure of CT linking through the whole thigh.

"Two patients and two athletes of different ages with interesting case histories were filmed," Ron says. "The clinical examples had different pathologies; three of them were met and treated for the first time on camera to show the immediacy of the method, the aim being to help clinicians explore the range of conditions they can affect by the method."

The video included practitioners from different disciplines to demonstrate the method to therapists who treat musculoskeletal conditions:

Jan Smith, the Australian representative to the International Sports Physiotherapy Federation, discusses her experience with and some of the theoretical aspects of FFT™ and describes its analgesic, rehabilitative benefits;

Susan Mayes discusses the benefit of the method for anterior impingement syndrome of the ankle, a condition of which she has extensive experience as physiotherapist for the Australian Ballet;

Stuart Hinds, soft tissue therapist at the Geelong AFL Club, comments on patient compliance with the method;

Narelle Davis, myotherapist for the Australian gymnastic team and the Victorian Institute of Sport, enabled filming of the assessment and application of FFT™ on a VIS gymnast with medial tibial stress syndrome;

Travis Whitmore, personal trainer at the Sanctuary Cove Recreation Club, used the method on a V8 Supercar driver suffering severe kneee pain after a major car accident.

"Two years later and more grey hair, I now understand why many videos are made with a plinth and presenter," Ron says.

"I was involved in every aspect of the editing of our video and became the producer, director, scriptwriter and one of the presenters.

"Had I known the expertise required for each of these roles and the time needed to produce a video that deviates from the norm, I doubt that I would ever have attempted this project.

"From both a personal and professional perspective, winning this award has provided a welcome reward for the long hours and effort invested in the video and achieving a standard of which I'm proud.

"I with to thank all those people in the industry who contributed to the success of the project."

Comings, goings, happenings...

Alice Springs: A 2004 National Conference update

Dining under the stars, waking the next morning with vague memories of having taken a camel to dinner the night before… Many delegates from the 1990 Australian Conference of Science and Medicine in Sport share this memory, and the 2004 ACSMS is offering you the opportunity to do it all again.

To complement a unique social program, luminary speakers from across the Sports Science and Medicine Milky Way will be presenting research and findings for the enjoyment and information of their colleagues and peers.

With Professor Bruce Abernathy (*How do they make it look so easy? Practice, skill learning and sports development from an expertise perspective.*), Dr Peter Brukner (*Does playing sport inevitably lead to arthritis?*), and Professor Mark Hargreaves (*Exercise, diet and skeletal muscle gene expression.*) already confirmed, the foundations for a solid scientific program have been well and truly laid.

The Conference Committee has been working hard to deliver topics of interest, with symposia on Applied Anthropometry, Thermoregulation, and Indigenous Sports Injury already under development.

Super Symposium "Lessons from the Summer Olympics" with main speaker Australian Olympic Team Head Medico Dr Peter Fricker, will be a conference highlight, featuring 3 X 3 presentations from other Olympic Team Medical Support Staff.

With a new symposium submission option, delegates have been handed more scope than ever before in the formation of the Conference's scientific program, which also features more room for podium presentations.

Please visit **www.sma.org.au/acsms/2004** for more information, registration, and the latest Conference updates.

New online service for members

Nigel Rowe (SMASA Branch) reports that SMA South Australia Branch is having success developing and trialling an online Member Management System (MMS).

The new system, which will soon go live to all States, includes an easily accessible and up-to-date data base for all members and SMA offices. The SMA National Office, State Branches and members will be able to access it and it will assist in overall efficiency and reduce paperwork. Members will be able to enter their own information and update it online whenever they wish.

One of the great features of the MMS is the *"Find a Sports Medicine Practitioner"* page or the "Blue Pages" as we like to call it. This web page will be open to members of the public and will enable practitioners, sporting organisations and people seeking personal treatment to create a *'practitioner search'* dependant on a number of criteria. This includes the practitioner's discipline, areas of special interest and the practice location. On this page members are able to give a brief outline of their experience and areas of interest as well as any items that they feel are important and worthwhile for public viewing.

In a few weeks, SMA members will be contacted and asked to take the 5-10 minutes to enter their data and "Blue Pages" information. The system is very user friendly but, if members have any problems, the State Braches will be able to help.

Four new faces in the ACT, NT and Queensland

SMA welcomes Simon Dolesji as the new Executive Officer in the **ACT**, following the resignation of Julia Keith to go to work in Queensland.

Simon came over from the 9th Australian Masters Games where he was a Sports Liaison Officer.

"Previous to that, I lived in Canada for two years and worked as a Program Manager for the Edmonton Springboard and Platform Diving Club.

"Before moving to Canada, I worked for two years at the Port Adelaide Football Club, mainly in the Membership Department.

"This took some adjusting as I am a passionate Geelong supporter!"

Simon enjoys most sports, "in particular AFL, baseball and ice hockey (from my time in Canada) and my hobbies include snowboarding, travelling and a bit of cooking."

And SMA ACT also has a new finance officer in Trish Donoghue, who is working part-time with Simon.

In the **Northern Territory**, Amanda Shipway is the new Executive Officer, following the resignation of Tracey Parker.

She comes to SMA from the Departments of Sport and Recreation and Business in the NT.

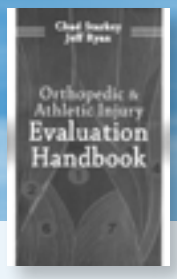
Amanda, who has a Bachelor degree in Business and the Certificate in Information Technology, enjoys playing and coaching basketball and walking with her children.

And, in **Queensland**, two changes:

Brendan Nugent has taken over the position of Central Queensland Coordinator.from Rob Stanton. Brendan grew up in Bundaberg and lives in Rockhampton so he is well aware of the issues of regional Queensland. He is studying a Human Movement/Business degree at Central Queensland University and will be working part time as the Sports Medicine Coordinator for Central Qld.

Darryn McCarty has left his position as South Queensland Education Coordinator to take up a teaching position. He has been succeeded (for three months initially) by Robyn Poole, who was at one time Education Coordinator with SMA WA.

For your Library



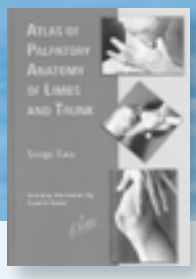
Orthopedic & Athletic Injury Evaluation Handbook

Chad Starkey and Jeff Ryan

Published by FA Davis, Philadelphia (available in May 2004 from Elsevier)

ISBN 0803611048

Described as a user-friendly, quick reference guide through evaluation procedures for palpation, range of motion, neurologic, ligamentous and special tests, this handbook also includes palpation photographs featuring anatomic overlays to help identify the underlying structure and aids for identifying postural disorders, gait abnormalities and common skin conditions.



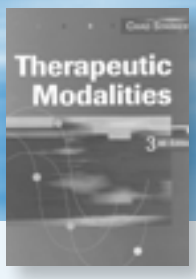
Atlas of Palpatory Anatomy of Limbs and Trunk

Serge Tixa

Published by Icon learning Systems, Teterboro, New Jersey (available from Elsevier)

ISBN 1929007248

This book, conceived as a reference for physicians, physical therapists, exercise physiologists, sports trainers and other professionals, is divided into 12 sections corresponding to body regions (neck, trunk and sacrum, shoulder, arm, elbow, forearm, wrist and hand, hip, thigh, knee, leg, ankle and foot). Each section is introduced with illustrations by Dr Frank H Netter, author of the *Atlas of Human Anatomy*. Sections are subdivided into chapters covering osteology, myology (musculotendinous structures), arthrology (joints and ligaments) and nerves and vessels.



Therapeutic Modalities (3rd edition)

Chad Starkey

Published by FA Davis, Philadelphia (available from Elsevier)

ISBN 0 8036 1139 0

This new edition of what was originally entitled *Therapeutic Modalities for Athletic Trainers* has been restructured to provide information in student-friendly and instructor-friendly blocks. It is organised into five sections: Injury Response and Treatment Planning, Therapeutic Cold and Superficial Heating Agents, Deep-Heating Agents, Electrical Stimulation and Mechanical and Light Modalities.

The Encyclopedia of Exercise, Sport and Health

Peter Brukner, Karim Khan and John Kron

Published by Allen & Unwin

ISBN 1741140587

The Encyclopedia of Exercise, Sport and Health has more than 2000 entries in an A-Z format on such issues as fitness, training, nutrition, injury prevention, alternative therapies, diagnosis and treatment. It contains easy-to-understand answers to questions across the whole range of exercise, sport and health: from **What foods should I eat in preparation for running the City to Surf?** to **As an older person, what sort of sport can I play?**

Peter and Karim we all know. John Kron, apart from being a registered physiotherapist, is Chief Sports Medicine Feature Writer for *Australian Doctor*.

Making Australian Sport Safer Sp

The Sports Trainer Page

Produced for *Sport Health* by SMA (Qld) Branch

The Dangers of Lightning and Playing Sports

Lightning is a dangerous phenomenon. Outdoors is the most dangerous place to be when a lightning storm hits! At the first sign of a storm, all players, staff or spectators should move indoors immediately. If you are unable to move indoors you need to avoid all forms of water, high ground, open spaces, metal objects, baseball dugouts, flagpoles, bleachers (wood or metal), golf carts and trees. If lightning is striking around you and you can't make it to safety then you need to crouch down and grab your legs and tuck your head in to minimise your body's surface area.

DO NOT lie flat on the ground!

Listed below are safety rules to consider when a storm is approaching:

1. Postpone activities promptly. Don't wait for rain.
2. Be the lowest point possible, because lightning hits the tallest objects.
3. Keep an eye on the sky!
4. Listen for the sound of thunder. If you hear any, immediately suspend your game or practice and instruct everyone to go inside a sturdy building or car/bus. DO NOT wait for rain as lightning travels miles in a blink of an eye and is especially hazardous at the beginning of a storm.
5. Listen to local radio weather forecasts before practice or games.
6. If you can't get to a shelter, stay away from trees.
7. Avoid leaning against vehicles.
8. Stay away from or get out of water, because it is a great conductor of electricity.
9. Avoid metal.
10. Move away from groups of people.

If someone is struck by lightning the following precautions should be taken:

- Call for help! Dial 000
- Give first aid if you are qualified to do so or know what to do
- Check for burns
- Get the person to safety if possible

Remember, someone who has been struck by lightning does not carry an electrical charge and can be handled safely.

Web Sites to Visit

www.orthopedics.about.com/cs/sportsmedicine

American based web site that covers a comprehensive range of sports injuries.

www.injuryupdate.com.au

This web site is dedicated to providing as much public information as possible regarding professional sports injuries in Australia, particularly football and cricket.

www.afl.com.au/default.asp?pg=injurynews

This web site looks at current information on latest injuries in the AFL.

Sports Trainer Stream at Queensland State Conference

For the first time in Queensland, a Sports Trainer Stream will run concurrently with the Professional Streams. The State Conference will take place in Townsville on 24–25 April (ANZAC weekend). For more information visit www.smaqld.com.au or ring 07 3870 4195.

Major Coverage Events 2003

LOCATION	EVENT	DATES	LEVEL	CONTACT
Queensland Gold Coast	Asia Pacific Master Games	6 – 14 November	Level 1 (Paid)	Joy Conway 07 3870 4195
Western Australia Perth	Australian University Games	26 September – 1 October	Level 1 (Paid)	Jo Parker 08 9285 8033
Northern Territory	Northern Territory Games Alice Springs	16 – 23 October	Level 1 (Unpaid)	Amanda Shipway 08 8981 5362
New South Wales Sydney	Sydney Rugby Competition Shute Shield &Premier League	April - September	Level 2 (Paid)	Prue Robertson 9660 4333

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Sports Trainer Tips

1. If **swelling** isn't obvious at an injury site, you can usually find it by checking for a **reduced range of motion** in a joint. If there is significant swelling within a joint, you will lose range of motion; the limb will only go so far in each direction. Compare one side of the body with the other to identify major visual, movement or strength differences.
2. **Fluids** that contain a small amount of sodium (25mg – 60mg) or potassium (40gm – 90 gm) and contain no more than 6 – 8 gm of sugar will be absorbed slightly quicker than a drink without any. Too much sugar slows down the rate of absorption. **Make your own sports drink** by combining 125 ml of orange juice, nine teaspoons of sugar, just under half a teaspoon of salt and enough water to make up 2 litres.
3. Encourage some **cross training mid season** for overall conditioning and to allow specific muscles to rest. Cross training will also alleviate boredom and staleness.

Updates to the Manual

The SMA Sports Trainer Manual was updated in August 2002. Updated information on the following topics can be found on the SMA national web site **http://www.sma.org.au/sportstrainers**

- Prevention and management of tooth injuries
- Management of brain injuries and loss of consciousness
- Environmental injuries –heat illness, acclimatisation and fluid replacement
- Asthma

SMA Clothing Order Form

To order, please complete this form and return to:

Sports Medicine Australia
PO Box 237
Dickson ACT 2602

Ph: 02 6230 4650
Fax 02 6230 5908
Email: smanat@sma.org.au

CLOTHING ITEM	SIZE (PLEASE INDICATE QUANTITY)					REGULAR PRICE	TOTAL
	S	M	L	XL	XXL		
Clothing							
Ladies Polo Shirt – Red						$55.00	
Ladies Polo Shirt – Blue						$55.00	
Ladies Polo Shirt - White						$55.00	
Men's Polo Shirt – Red						$58.00	
Men's Polo Shirt – Blue						$58.00	
Men's Polo Shirt - White						$58.00	
SMA Hat						$30.00	
Spray Jacket						$75.00	
Unisex Shorts						$32.00	
Sports Trainer Clothing							
Polo Shirt						$44.00	
Jacket						$154.00	
Black Sweat Pants						$25.00	
Red Shorts						$44.00	
Other Items							
Preferro P –Pack Small						$28.00	
Preferro P-Pack Medium						$32.00	
Preferro P-Pack Large						$36.00	
Preferro P-Pack X Large						$40.00	
X Vest						$175.00	
Pedometer						$35.00	
Dentist in a Box ($35 for non-members)						$30.00	
Freight (1-3 items $5, 4-9 items $10, 10or more items $15)							
Total							

All prices are in Australian Dollars and are inclusive of GST

Name: ..... Phone .....

Postal Address .....

City ..... State ..... Post Code .....

☐ I have enclosed a Cheque/Money order made payable to Sports Medicine Australia

☐ I wish to pay by: ☐ Mastercard ☐ Visa ☐ Bankcard Amount Authorised: $ .....

Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Expiry Date: ☐☐/☐☐

Cardholder's Name: .....

Cardholder's Signature: .....