Physical activity is a widely accepted means of increasing serum high density lipoprotein cholesterol (HDL-C) levels. However, how exhaustive training influences serum HDL-C levels remains unknown. Intense exercise increases oxygen consumption and free radical formation, and induces oxidation of low density lipoprotein (LDL). HDL plays an important protective role in LDL oxidation. An imbalance between free radical production and antioxidants is considered to lead to oxidation of LDL and subsequent alterations in serum HDL metabolism. This study investigates changes in serum urate, which is the most important intrinsic antioxidant, and serum lipids during exhaustive training.

We measured fasting serum lipids and urate in 11 male athletes (mean (SD) age 21.2 (2.2) years; height 168.3 (4.2) cm; body weight 65.4 (3.7) kg) before and after three weeks of exhaustive training. All the subjects performed the same intensity exercise, which consisted of a 20 (3) km run and isometric training for two hours every day for three weeks. The daily diet provided 9802 (209) kJ and consisted of about 12–15% protein, 55–65% carbohydrate, and 25–30% fat over the study period. None were taking drugs known to affect lipid and lipoprotein metabolism. Special care was taken to exclude athletes using anabolic drugs, vitamins, or other antioxidants or who were smokers. Serum lipids were measured by automated enzymatic means using Determiner TC (Kyowa Medex Co, Tokyo, Japan) for total cholesterol, AutoSera S TG-N (Daiichi Pure Chemicals, Tokyo, Japan) for triglycerides, Determiner HDL-C (Kyowa Medex) for HDL-C, and Cholestest LDL (Daiichi Pure Chemicals) for LDL-C. Serum urate was measured using the uricase calorimetric method (Fuji Co, Tokyo, Japan).

After three weeks of training, serum HDL-C levels increased in six subjects, and decreased in five (fig 1A). As expected, the changes in serum LDL-C levels were inversely associated with the change in serum HDL-C levels (data not shown). However, serum triglyceride levels were not significantly different after training in all participants (data not shown). Unexpectedly, serum urate levels decreased in all subjects with increased HDL-C levels, but increased in all with decreased HDL-C levels (fig 1B). The change in serum urate levels correlated significantly and inversely with the change in serum HDL-C levels (fig 2).

Physical activity is a widely accepted means of increasing serum HDL-C levels, and it represents a metabolic adaptation that contributes to a reduced risk of coronary heart disease. However, the influence of exhaustive training on serum HDL-C levels remains obscure. Our data show that the effect of the same conditioned exhaustive training on serum HDL-C levels varies greatly among individuals.

Furthermore, we identified a significant inverse correlation between the changes in serum urate, which is the most important intrinsic antioxidant, and HDL-C levels, indicating the close association between urate and HDL metabolism during exhaustive training. However, we should mention that the number of participants was limited and the detailed mechanisms underlying this phenomenon remain to be elucidated.

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References

Are Reliable Change (RC) calculations appropriate for determining the extent of cognitive change in concussed athletes?

Reliable Change (RC) indices are a group of statistical techniques used in many areas of
Step 3: Calculate the RC score

This has led to the description of the application of RC analyses to neuropsychological test data collected at baseline (preseason) and after a concussion.1 These authors have stated that the results of RC analyses provide the best means for guiding decisions about whether or not true changes in cognitive function has occurred after a concussion, and can therefore assist the return to play decision making process. Although we support the use of RC techniques to guide decisions about concussion, we have concerns about the statistical computation and interpretation of various RC indices.

RC techniques were first described by Jacobson and Traux, and were designed to aid decision making about the significance of cognitive changes in patients in whom an injury or intervention had taken place. These and subsequent authors1 proposed that the most efficient way of determining whether an individual's change on a specific cognitive measure had changed was to express the magnitude of change—that is, a change score—as a function of the normal variation found for that measure. Normal variation in performance within the cognitive measure is estimated from a group of similar subjects in whom no injury or intervention had occurred. Mathematically, the individual's change in performance is expressed in the numerator of the RC index, and the normal variation in performance on that measure is expressed in the denominator as follows.

Step 1: Calculate the standard error of measurement ($S_m$) $S_m = S \sqrt{1-r}$

Step 2: Calculate the standard error of difference ($SE_{diff}$) $SE_{diff} = SE \sqrt{1-r}$

Step 3: Calculate the RC score $RC = \frac{x_2 - x_1}{SE_{diff}}$

Clinicians, neuropsychologists, and statisticians working with RC techniques soon realized that “true” changes in test scores could be obscured by performance changes due to practice—that is, prior exposure to a test leads to improved performance on a subsequent assessment—and also by statistical phenomena such as the reliability of the test itself and the related regression to the mean. This has led to the description of RC scores and application of some of the various standards of the basic RC index. These variants have sought to provide more accurate guidance to decisions about change caused by an event by incorporating corrections for practice effects, test reliability, and regression to the mean.

The use of RC analyses may be interpreted statistically as a z score, with changes greater than 1.65 indicating that true change has occurred. In sport medicine, the focus is to detect decline in performance after a concussion—that is, a one tailed hypothesis—an RC of less than -1.65 indicates that true decline has occurred.1 One advantage of RC statistics is therefore that they can be applied immediately to individual level data, and therefore interpreted on an individual basis. This makes them applicable to clinical situations such as sports related concussion.

RC analyses were designed in accordance with conventional models of neuropsychological assessment—that is, to determine whether the change observed in the individual is true by comparing it with change that occurs normally in some matched normative data set. The problem with currently applied RC calculations is that the normal amount of variation in change over time within individuals is estimated on the basis of differences between individuals assessed at a single time point! There is no reason to believe that variation between individuals at one time accurately represents the variation within individuals between two time points. A related problem with current RC analyses is that the normal variation represented in the denominator is termed the standard error of the difference ($SE_{diff}$); despite the fact that it is computationally the standard deviation of the individual scores at one point in time. A true estimate of change requires the standard deviation of difference scores ($SD_{diff}$) in the denominator.

In sports medicine, we are in the fortunate position of having many healthy young subjects enrolled in longitudinal studies of sports related concussion, when applied to the concussion data acquired from these studies. There should be no reason why the normal change in performance over time within individuals cannot be determined directly from such control group data rather than using inappropriate estimates of variation. In fact, many researchers have obtained serial data for inclusion in RC calculations as corrections for the effects of practice observed in normal populations, including some working in sports concussion.1 Although such serially acquired data are adequate for directly estimating the $SD_{diff}$ from a normal sample, these authors have chosen to use the “estimated” $SD_{diff}$ rather than directly calculating the $SD_{diff}$ for inclusion in the RC calculation. Some minor alterations to previous RC calculations produce an RC calculation that is mathematically and theoretically correct, yet retains all the virtues of previously proposed RC calculations. The alterations are as follows.

Step 1: Calculate the difference scores for each individual in a control group assessed at an appropriate test-retest interval.

$$A_{diff} = \bar{A} - A$$

$$B_{diff} = \bar{B} - B$$

$$N_{diff} = N_{diff}$$

Step 2: Calculate the sum of the squared ($SUM_{succeed}$) deviations from the mean difference score. This will be included in the calculation for the standard deviation of the difference score.

$$SUM_{succeed} = \sum \left( \frac{(A_{diff} - \mu_{diff})^2 + (B_{diff} - \mu_{diff})^2 + \ldots + (N_{diff} - \mu_{diff})^2}{N-1} \right)$$

Step 3: Calculate the standard deviation of these difference scores ($SD_{diff}$). This becomes the denominator in the RC equation.

$$SD_{diff} = \sqrt{SUM_{succeed}/(N-1)}$$

Step 4: Calculate the RC score for the individual athletes by placing the individual athlete’s change score in the numerator of the RC equation, and the $SD_{diff}$ score in the denominator.

$$RC = \frac{x_2 - x_1}{SD_{diff}}$$

$A_{diff}$ is the test-retest difference score for person $A$, $B_{diff}$ is the test-retest difference score for person $B$, $N_{diff}$ is the total number of paired observations, $x_1$ is the concussed athlete’s baseline test score, and $x_2$ is the concussed athlete’s test score after concussion.

This RC technique can be interpreted as a z score, with a change of greater than -1.65, indicating significant decline from baseline using a one tailed hypothesis. Such RC scores may also be interpreted as “effect size” calculations, very similar to Cohen’s d scores as described by Zakzanis.5 Our research group has applied this calculation to neuropsychological test data gained in concussed athletes in many sports world wide and in many other medical applications where issues of change in an individual’s cognitive status are pertinent.17 Corrections for practice effects and other confounding variables may also be included in this calculation as per current RC techniques.

**Summary**

RC analyses have the potential to inform return to play decision making in cases of sports related concussion, when applied to serially acquired neuropsychological test data. However, to be applied appropriately, such calculations should endeavour to assess the magnitude of change in an individual’s test score relative to change in a control group assessed at similar test-retest intervals. Previously described RC calculations do not meet this basic criterion, despite such control data being available.

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**References**


Accessory nerve injury during amateur wrestling: silent but not overlooked

A 17 year old youth presented complaining of vague chest and back pain. His medical history was unremarkable except for a sports injury three to four months previously. The injury occurred during wrestling when his opponent had fallen on his chest and neck region. On physical examination, we noted an asymmetric neckline on the right, the result of a drooping shoulder. No loss of motor function, both passive and active, were not present. The patient did not present with a trapezius palsy; it was a late silent physical finding that we uncovered. Secondly, as in a few of the cases in the above series, only the upper trapezius atrophy was present which did not preclude a shoulder function. This is usually because there are other innervation sources or because of the presence of a divided accessory nerve. Thirdly, we believe that our case implies the likelihood of a relatively benign course in younger patients. Lastly, together with another case report of a wrestler, the possibility of this type of injury occurring during sporting activity is highlighted. Therefore we alert sports physicians to such a clinical scenario, for which prompt evaluation and management should always be the prerequisite.

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References

Applying elite research to the general population

We are writing in response to the letter by Dr Webborn about our circadian research on competition swimmers. First, there is the fact that we are aware of the possibility of stalling the heart rate in the pre-competition period. This has been shown in a study of elite athletes and it has been reported in non-elite athletes. The question is whether this is a general phenomenon. We believe that it is not.


Editor’s response
The role of the Journal’s “take home message” had been under review for some time before this correspondence. It has already been decided that it will be changed to a highlighted box encapsulating “what is known about the topic” and “what this paper adds to the knowledge”. This will be similar to the current layout in the British Medical Journal, and our technical editors have been developing a format to suit the Journal style. This correspondence has simply highlighted an important consideration of the Journal, namely how we deal with the media in a clear, concise, and appropriate way.

Response to “Bergen in retrospect: effect of varied weight training programmes on strength”

I would not have believed in 1962 that my study would have created such a brouhaha in...
the 21st century. Dr Carpinelli’s paper credits my study as “the genesis of the unsubstantiated belief that multiple sets are required for optimal gains in strength”. His opinion is complimentary in one respect, but I cannot take full credit for it. Most professionals in the field of weight training and therapy have added credence and support to these words by employing multiple sets in their practice and research. In my opinion, most professionals trained before multiple sets because they have experimentally discovered that multiple sets are more effective than one set. Some early research studies have compared different weight training programmes, but in practice, multiple sets were used in training.” I am hardly the “genesis” of an “unsubstantiated belief”. Historically the medical applications of strength training for therapy involve multiple sets. One set is the exception. So Berger is not as one “crying in the desert”. There are many more therapists and coaches flinging down the gauntlet in support of multiple sets.

The probability level of 0.05, which academics hold so sacred in decision making, does not always supersede in importance common sense when considering the difficulties in experimental design. An attempt to control various factors in strength research. One research problem is finding subjects who have, preferably, no experience in weight training and who are able to train for long periods of time. Multiple sets were used in controlled conditions. If I had concluded in my study in 1962 that one set was as good as multiple sets, I would have had more than just Dr Carpinelli voicing criticism of my paper. The practitioners in the field would have condemned me years ago to express their disagreement and would not have waited 40 years to do so.

A person who comes to my mind as one having projected the single set in past years is Arthur Jones, the developer of the Nautilus machine. To my knowledge, he has never presented any acceptable scientific evidence supporting his belief. Furthermore, he has few adherents today of his training views, although one adherent is obvious. Of the 85 references in Dr Carpinelli’s paper, Mr Jones authored not one. Certainly his contribution to the body of knowledge in strength training should be acknowledged, if deserving.

I decided to deal with a limited amount of “evidence” in defence of my study. But I must preface my remarks by assuring the readers that my paper was reviewed by several researchers at the time of acceptance and approved by them for publication. The conclusions I drew were substantiated and accepted by them. For Dr Carpinelli to refer to my study as the “genesis of the unsubstantiated belief” is considered to the opinions of these reviewers.

The data in tables 1, 2, and 3 of Dr Carpinelli’s paper, which were used to critique my study, were inappropriately used according to acceptable statistical protocol. Comparisons between subgroups I-2, III-6, etc were not valid for critiquing my study. When a factorial design is used, as in my study, and no significance is found between factors of sets and repetitions, then the only legitimate analysis to make is on main effects—that is, comparisons among sets 1, 2, and 3 across all levels of sets and repetitions, and among repetitions 2, 6, and 10 across all levels of sets. When this was done, significant differences were found, with three sets and six reps resulting in the greatest improvement. I spoke to Dr Carpinelli earlier (1998 communication) about his misuse of statistics and suggested he consult a statistician. If this had been done, there would not have been a critique of my study, nor a need for one. I must admit, though, that I made the same mistake as Dr Carpinelli in my study. In table 4 of my study, I erroneously made comparisons among subgroups of sets and repetitions. However, as a neophyte in 1962 I accept the blame. Being wiser today than 40 years ago, and even considering Dr Carpinelli’s critique, I unequivocally support multiple sets over single sets for optimising strength. I would suggest to Dr Carpinelli that he conduct research of his own in the hope of gaining support for his position. If his zealosity, which is commendable, were redirected to researching rather than to criticising old studies, his academic contributions would be more fruitful.

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References

Will the new field hockey rules lead to more injuries?

On 1 January 2003, the International Hockey Federation introduced a mandatory experimental amendment to the rules pertaining to the taking of short corners. The new rule now reads “Penalty corner: no shot at goal shall be made until the ball has travelled outside the circle”. This change means it will no longer be necessary for attackers to stop the ball before taking a shot at goal as was previously the case. The reason given for introducing the rule was to “simplify the game without altering the overall nature of something which is unique to hockey”. Short corners present a good opportunity to score a goal and are practised routinely in training. The new ruling was introduced on 1 March 2003 by the Ulster Branch of the Irish Hockey Association in whose leagues I play. I have now played three games under the new ruling, and the danger of this rule has been brought sharpy into focus. In two of the three games, players required hospital attention because of knee and ankle injuries as a result of defending the circle corner. It is normal practice that the defenders advance from the goal line to prevent the attacking team shooting, once the ball has been hit. The twin effect of reducing time required to take a shot, as a result of the attacking team not being required to stop the ball, leaves defenders with very little reaction time to avoid being struck by an incorrectly hit ball which may rise off the ground. In lower leagues, hitting technique is often less well developed and it is common for the ball to be lifted during a shot. Concern has been expressed at the number of facial injuries in hockey, and it is my belief that the rate of injuries (both facial and other) will increase as a result of this new rule, some of which may be severe.

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References

Complementary therapies for physical therapists


Public interest in complementary therapies has increased dramatically in the last few decades, with many of the new treatment methods of potential interest to physical therapists and their patients. This is therefore a timely volume.

It comprises some 23 chapters complemented by 11 extra chapters available via the internet. The authors are not well known to me, but they clearly each have a special interest in their chosen topic.

After an initial and intellectually challenging chapter on “Energy medicine”, which a physcist would have difficulty accepting, the authors present a practically theoretical approach to a wide range of alternative therapies. Some, such as acupuncture, Feldenkrais, and myofascial release, have gained some acceptance among physiotherapists, whereas others, including therapies involving the Chakra system, reflexology, flower essences, and electro-crystal therapy, remain firmly on the fringe of modern practice.

In the foreword, we are asked to read critically and consider the evidence for the various approaches presented. An excellent suggestion but very difficult to do from the material presented! The authors cover the theory behind the techniques in some detail, but there is little to support their assertions. Those looking for an evidence based text will be disappointed. While reading each chapter, I spent much of my time peering at the reference lists. Most of the references were to
Science for exercise and sport


The basic scientific principles and working techniques relevant for science in the field of exercise physiology and exercise and sport sciences are described in this book. It is written for undergraduate students with more or no experience and knowledge in science.

The book is divided into three sections. The first section covers the physical states of gas, liquid, and solid. The second explains forces, energy, and electricity. The third addresses data analysis and report writing. Each chapter starts with a list of learning objectives, a short introduction which highlights the relevance for sports and exercise, so called “action points” enable the reader to check the learning success. A conclusion briefly summarises the take away message, and “key points” condense the latter to its essence.

In general, the structure of the book is systematic, consistent, and in principle helpful, and the content covers a thorough portfolio of knowledge which is relevant for a successful start in experimental sport and exercise science. Nevertheless, it remains rather difficult whether the book would really attract the attention of the targeted readership. It is much too text dominated. This weakens the impact of adequate wording and the provided examples of application and scientific transfer. Most of the figures and flow charts are of poor quality. It also remains questionable whether detailed descriptions of the personal computer, software, and the internet are really necessary nowadays.

In conclusion, the book is well structured with mostly convincing content but a rather suboptimal layout. After thorough revision of the layout and minor aspects of content, it has the potential to improve from one of many more or less adequate handbooks to a very good tool which not only meets the requirements with respect to learning objectives but also to an adequate presentation to the targeted readership.

Analysis
Presentation 16/20
Comprehensiveness 17/20
Readability 15/20
Relevance 6/20
Evidence basis 3/20
Total 57/100

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The Cutting Edge: Joint Conference of The British Association of Sport and Exercise Sciences and The British Association of Sport and Exercise Medicine in association with the National Sports Medicine Institute
3–7 September 2003, Sheffield
Further details: R.M. Bartlett. Email: r.m.bartlett@shu.ac.uk

Football Australasia Conference
23–25 September 2003, Melbourne, Australia
Further details: Football Australasia Conference, PO. Box 235, North Balwyn, Victoria 3104, Australia

Congress for Science and Medicine in Cricket
25–26 September 2003, Loughborough, UK
Further details: Julie Page, ECB. Tel: +44 (0)207 432 1261; email: julie.page@ecb.co.uk

The 5th British Musculoskeletal ultrasound course
1–3 October 2003, Leeds, UK
Musculoskeletal sonologists from the UK and mainland Europe will cover all aspects of musculoskeletal ultrasound in lectures and tutorials. The course is open to radiologists, radiographers, and clinicians with a US imaging interest.
Further details: Gill Bliss, MR Department, Clarendon Wing, Leeds General Infirmary, Great George Street, Leeds LS1 3EX. Tel: +44 (0)113 392 3768; fax: +44 (0)113 392 8241; email: gillian.bliss@leedsth.nhs.uk

Back Pain Prevention and Rehabilitation
5 October 2003, Glasgow, UK
A study day with Professor Stuart McGill.
Further details: Yvonne Gilbert, BASEM Secretary, Royal College of Surgeons of Edinburgh, Nicolson Street, Edinburgh EH3 9DW. Tel: +44 (0)131 527 3409; email: y.gilbert@rcsed.ac.uk. Organised by BASEM Scotland.

Congress of Sports Medicine of the AZ Sint-Jan AV
24–25 October 2003, Bruges, Belgium
Further details: Congress Centre, OUD SINT-JIN, Mariastaat 38, B-8000, Brugge, Belgium; email: brucongress@azbrugge.be; website: www.brucongress.be

International Conference on the Science and Practice of Rugby
5–7 November 2003, Brisbane, Australia
Further details: Kerry Williams, Conference Organiser, QUT, GPO Box 2434, Brisbane, QLD 4001, Australia. Tel: +61 7 3864 2220; fax: +61 7 3864 5160; website: www.rugbystudies.com/conference

The Fifth International Conference on Sport, Leisure and Ergonomics
19–21 November 2003, Burton, Cheshire, UK
A three day conference in affiliation with the Ergonomics Society.
Further details: Congress Secretariat, Sport, Leisure and Ergonomics, Research Institute for Sport and Exercise Sciences, Liverpool John Moores University, Henry Cotton Campus, 9–21 Webster Street, Liverpool L3 2ET, UK. Tel: +44 (0)151 231 4088; email: K.George@livjm.ac.uk

Medicare India
6–8 April 2004, New Delhi, India
This exhibition and conference will be held for the first time, following India’s ambitious “health for all” programme launched in 2002. Further details: Rob Grant, Kinex Log, 3 New Quebec Street, London W1H 7DD, UK. Tel: +44 (0)207 723 8020; fax: +44 (0)207 723 8060; email: rob.grant@kinexlog.com; websites: www.medicare-expo.com and www.kinexlog.com
The 6th STMS World Congress on Medicine and Science in Tennis in conjunction with the LTA 2004 Sports Science, Sports Medicine and Performance Coaching Conference
Keynote speakers include Professor Per Renstrom (SWE), Professor Peter Jokl (USA), Professor Savio Woo (USA), Dr Carol Otis (USA), Dr Mark Safran (USA), Dr Ben Kibler (USA), Prof Bruce Elliott (AUS), and Professor Ron Maughan (UK).
Further details: Dr Michael Turner, The Lawn Tennis Association, The Queen’s Club, London W14 9EG, UK. Email: michael.turner@lta.org.uk

NOTES AND NEWS

The Paul West Memorial Grant for Sport and Exercise Medicine Research in Scotland
BASEM and the family of Paul West are pleased to announce the above grant which will be awarded annually. The award will be approximately £350. The research must be carried out in Scotland and concern the physically active population. Applications must be submitted to the Award Committee by 31 October 2003 for the inaugural award in January. Further details: Yvonne Gilbert, BASEM - Scotland Administrator, Royal College of Surgeons of Edinburgh, Nicolson Street, Edinburgh EH8 9DW, UK. Tel: +44 (0)131 527 3409; fax: +44 (0)131 527 3408; email: y.gilbert@rcsed.ac.uk

Intercollegiate Academic Board of Sport and Exercise Medicine Diploma Exam
Professor Donald Macleod has completed his four year term as Chairman of the Intercollegiate Academic Board of Sport and Exercise Medicine. Professor Charles Galasko has been elected by the IABSEM Board to replace him. Professor Macleod has also been replaced as the representative of the Royal College of Surgeons of Edinburgh on IABSEM by Professor Angus Wallace.

Winners of the annual BASEM Prizes
Dr Eileen Mackie (Clopidogrel inhibits platelet activation and exercise induced ischaemia in stable coronary artery disease) and Mrs Eleanor Curry (Role of exercise in multiple sclerosis) (joint winners). The poster prize was won by Dr Stuart Reid (Injury patterns and injury prevention strategies in the winter sports population). The poster prize was won by Dr Stuart Reid (Injury patterns and injury prevention strategies in the winter sports population).

The poster prize was won by Dr Stuart Reid (Injury patterns and injury prevention strategies in the winter sports population).

Dr Eleanor Curry (Role of exercise in multiple sclerosis) and Mrs Yvonne Gilbert, Intercollegiate Academic Board for Sport and Exercise Medicine, Royal College of Surgeons of Edinburgh, Nicolson Street, Edinburgh EH8 9DW, UK. Tel: +44 (0)131 527 3409; fax: +44 (0)131 527 3408; email: y.gilbert@rcsed.ac.uk

FURTHER DETAILS
Dr Michael Turner, The Lawn Tennis Association, The Queen’s Club, London W14 9EG, UK. Email: michael.turner@lta.org.uk

Intercollegiate Academic Board of Sport and Exercise Medicine Diploma Exam
The following were successful diplomates in the Intercollegiate Academic Board of Sport and Exercise Medicine Diploma Exam, for the two exams held in 2001 and 2002:
• Dr Andrew J Adair
• Dr Abimola Afolabi
• Dr Sinead M Armstrong
• Dr Terence J R Babwah
• Dr Catriona E L Boyle
• Dr Susan J Brick
• Dr Lawrence J Conway
• Dr Alan J Dawson
• Mr Patrick D Dissmann
• Dr Niall WA Elliott
• Dr Christopher J Ellis
• Dr Roger K Goulds
• Dr Niall A Hogan
• Dr James R Hopkinson
• Mr Ananta K Jayanti
• Dr Michelle Jeffrey
• Mr S P Kale
• Dr Arun Kumar
• Dr Robert M MacFarlane
• Dr Kaushal C Malhan
• Dr Martin D McConaghy
• Dr Lisa A McConnell
• Dr Fergal T E McCourt
• Dr Ronan M McKeown
• Dr Michael G McMullan
• Dr Steven R McNally
• Dr Paul J Moroney
• Dr Leonard D M Nokes
• Dr Nanda K G Pillai
• Dr Jonathan D Rees
• Dr Duncal A Reid
• Dr Cristyn C Graham-Dillon
• Dr Martin O Rochford
• Dr Hungerford A T Rowley
• Dr Shaun A Sexton
• Dr Jason E Smith
• Dr Aravindhan Suppiah
• Dr James A Thomas

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www.basem.co.uk
The British Association of Sport and Exercise Medicine has launched its new website—www.basem.co.uk. The site provides information about the educational opportunities in sport and exercise medicine and advice to those wishing to become involved in this area.

Interested in Sports Medicine?
Gain a higher degree from Australia’s leading University
The Centre for Sports Medicine Research and Education is a multidisciplinary Centre located in the Faculty of Medicine, Dentistry and Health Sciences at the University of Melbourne, Australia. It combines world-class researchers and clinicians working in the area of sports medicine.

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Web site: www.med.unsw.edu.au/sportsmed

NCPAD NEWS
A monthly publication of the National Center on Physical Activity and Disability. NCPAD is the leading source for information about organisations, programmes, and facilities nationwide providing accessible physical activity and recreation. NCPAD also has a large and growing online library of fact sheets, monographs, and contact information on physical activity and recreation for people with disabilities. Sign up for this free monthly electronic newsletter by sending an email to: Listserv@listserv.ucic.edu, with this message in the body of the e-mail: SUBSCRIBE NCPAD-NEWS yourfirstname yourlastname. If you have any difficulty, you can also sign up for the newsletter by going to http://www.ncpad.org/signup

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or the Postgraduate Certificate in Physiotherapy (Sports Physiotherapy of the Spine, Shoulder and Upper Limb).

The School of Physiotherapy at the University of Melbourne now has approval for these courses and applications are open to international students for full time study.

- Master of Physiotherapy by Coursework (Sports Physiotherapy) NOW CLOSED.
- Postgraduate Certificate in Physiotherapy (Sports Physiotherapy of the Spine, Pelvis and Lower Limb) NOW CLOSED.

Please check the website for updates and information about the courses: