

# Centre for Exercise and Sports Science Research

## Annual Report 2007

Faculty of Computing, Health and Science

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## INTRODUCTION

The Exercise and Sports Science Research Group (ESSRG) was formed in July 2000 and brought academic staff from multiple disciplines whose research focuses on various aspects of exercise and sport for both athlete performance and health in the general population. Since then, our goals have been to foster high quality research in exercise and sports science; to promote and enhance the teaching of exercise and sports science at ECU; and to establish collaborative links with other research groups and institutes in an effort to contribute to exercise and sports science needs at local, national and international levels. In 2007 we successfully applied to the University to become a Level 2 Research Centre. As a result our name has changed to **Centre for Exercise and Sports Science Research (CESSR)**.

Major areas of specialisation have included: biomechanics; physiology of exercise; psycho-social aspects of sport and leadership; multi-dimensional studies into ageing; motor control and learning; exercise rehabilitation; strength and conditioning science and chronic disease management. Research highlights for 2007 include our promotion to Level 2 status, two grants awarded for research into exercise and prostate cancer, and a 21% increase in refereed journal publications and 41% increase in research income.

Research conducted by staff at CESSR has continued to build during 2007 due to the continuing high research activity of the staff and students. We have achieved good recognition and research outcomes for sports performance research, exercise and ageing, exercise and chronic disease management, biomechanics of neck injury, and basic science in the physiology and biomechanics of muscle damage. Publications have increased by 25% and total research output by 7% compared to 2006.

## OBJECTIVES

The objectives of the group are to conduct scientific research and provide postgraduate training in the area of exercise and sports science. The knowledge, experience and skills gained are then used to inform undergraduate and

postgraduate teaching. The specific aims of the research group are:

- To foster high quality research in exercise and sports science at ECU
- To promote and enhance the teaching of exercise and sports science at ECU
- To attract and support honours and postgraduate students
- To establish collaborative links with other research groups and institutes
- To attract research funding from competitive grant agencies and industry
- To contribute to exercise and sports science needs at local, national and international levels

## PRIMARY RESEARCH AREAS

The Exercise and Sports Research Group conducts research into several key areas:

- Development of athlete performance through strength and conditioning.
- Endurance performance and thermoregulation in athletes.
- Application of exercise as medicine for treating and preventing disease, maintaining health, physical and mental function.
- Physiology and biomechanics of exercise-induced muscle damage and adaptation and neuromuscular fatigue.
- Biomechanics of neck muscle function, injury, prophylactic and rehabilitation programs.
- Psycho-social influences in the participation and adherence to physical activity.

## MEMBERSHIP

The ESSRG is headed by the Foundation Professor in Exercise and Sports Science who coordinates the team of academic and technical staff, strategic adjunct appointments, honours and postgraduate students.

Co-ordinator: Professor Robert Newton

Academic Staff:

Assoc. Prof. John Cronin

Dr Dylan Edwards

Dr. Daniel Galvão  
Assoc. Prof. Barry Gibson  
Fiona Iredale  
Assoc. Prof. Paul Laursen  
Dr Mike McGuigan  
Dr. Michael Newton  
Assoc. Prof. Ken (Kazunori) Nosaka  
Dr Elizabeth Rose  
Dr. Greig Watson

Adjuncts: Professor William Kraemer (University of Connecticut)  
Professor Michael Stone (USOTC)  
Dr Paul Sacco (University of East London)  
Dr Angus Burnett (Curtin University of Technology)  
Professor Bonnie Berger (Bowling Green State University)  
Associate Professor Kay Cox (Medical Research Foundation,  
Royal Perth Hospital)

Technical Staff: Jon Green  
Nadija Vrdoljak

### **PhD Students and their Research Projects (Supervisors)**

Chris Abbiss: Examination of factors influencing the regulation of exercise intensity in well-trained cyclists (Paul Laursen)

Abdulaziz Al Dayel: Comparison between pulsed current and alternating current in electrical muscle stimulation for muscle function, damage and hormonal responses (Mike McGuigan, Ken Nosaka)

Warren Andrews: Injury risk and functional status of the hamstring muscles: Effects of fatigue under game conditions and evaluation of prophylactic conditioning programmes (Rob Newton)

Daniel Baker: A series of studies on professional rugby league players (Rob Newton)

Matt Brughelli: The effect of eccentric exercise on the torque-length and force-velocity properties of the hamstrings (John Cronin, Ken Nosaka)

- Dale Chapman: The effect of contraction velocity on muscle damage and adaptation of the human elbow flexors (Ken Nosaka, Mike McGuigan)
- Prue Cormie: The influence of strength level on the force-velocity relationship and the ability to adapt to power training (Rob Newton, Mike McGuigan)
- Stuart Cormack: Neuromuscular fatigue, hormonal profile, immune response and markers of muscle damage in elite Australian footballers (Robert Newton, Mike McGuigan)
- Keir Hansen: Predicting supercompensation and readiness to train (John Cronin)
- Peter Hope: Contemporaneous fatigue in women undergoing radiation therapy for breast cancer (Rob Newton)
- Naruhiro Hori: Effects of weightlifting exercises on the biomechanics of jump, sprint and change of direction performance (Rob Newton, Mike McGuigan, Ken Nosaka)
- Naoki Kawamori: Understanding and developing sprint initial acceleration performance of team-sport athletes (Rob Newton, Ken Nosaka)
- Matt Kritz: Developing a movement competency based assessment battery and investigating it's effect on long-term athletic development (John Cronin)
- Kristie Lee-Taylor: Using critical flicker fusion and kinetic data to predict readiness for training (John Cronin, Michael Newton)
- Micheal Lim: Effects of resistance training on ambulatory blood pressure and cardiovascular risk markers in older adults (Rob Newton, Kay Cox)
- Nur Ikhwan Mohammad: Kinematics and kinetics associated with hypertrophy training (John Cronin, Ken Nosaka)
- Lynda Murray: Effects of peripheral sensory inputs on cortical responses to spike timing dependent plasticity (Ken Nosaka, Dylan Edwards, Gary Thickbroom)
- Makii Muthalib: Effects of exercise-induced muscle damage on muscle microcirculation and neuromuscular function (Ken Nosaka, Guillaume Millet)
- Sophia Nimphius: Strength, power and muscle architecture – The effects of in-season resistance training and a cross-sectional comparison in female athletes (Rob Newton, Mike McGuigan)

Jeremiah Peiffer: Recovery from exercise in the heat using cold water immersion (Paul Laursen, Ken Nosaka, Greig Watson)

Steve Pratt: Nutrition and physical activity programs for cancer patients (Rob Newton)

Marc Quod: Mathematically modelling the training and performance power outputs of elite cyclists (Paul Laursen: in collaboration with the Australian Institute of Sport and Cycling Australia)

Alastair Stewart: Self-perceptions and motivation changes with a behavioural intervention versus a self-managed program in older adults: The PATH Study (Elizabeth Rose)

Jeremy Sheppard: The competitive, physiological and trainable aspects of vertical jump performance: A focus on volleyball athletes (Rob Newton, Mike McGuigan)

Rodney Siegel: The influence of temperature on eccentric exercise-induced muscle damage (Paul Laursen, Ken Nosaka, Greig Watson)

### **Masters by Research Students and their Research Projects (Supervisors)**

Adam Beard: Load power relationships in the power clean (Rob Newton, Angus Burnett)

Jack Burns: The effect of PowerCrank™ training on cycling efficiency and performance in cyclists” (Paul Laursen, Greig Watson)

Melissa deKlerk: The use of the jump-landing sequence as a prognostic and diagnostic tool for clinicians and strength and conditioning practitioners (John Cronin, Ken Nosaka)

David Frost: A kinematic and kinetic comparison of pneumatic vs traditional resistance strength training devices in the upper body (Rob Newton, John Cronin)

Tasuku Fujikake: Detection of muscle damage by ultrasound images (Ken Nosaka)

Richard Garrad: Systemic and muscle oxygen consumption in maximal and submaximal concentric and eccentric contractions of the elbow flexors (Ken Nosaka)

Zoe Gibbs: Keeping the aged healthy, happy and independent through physical and cognitive exercise (Darryl Turner, Rob Newton)

- Sandra Hill-Williamson: Are performance tests able to effectively discriminate between elite, sub-elite and recreational level youth soccer players? (Mike Newton, Ken Nosaka)
- Ben Hinton: Does whole-body vibration elicit the same potentiation response as a heavy strength set? (Mike Newton, Mike McGuigan)
- Kenny Hong: Correlation between performance tests and time motion analysis of youth soccer (Mike Newton, Mike McGuigan)
- Barbara Howard: Self-concept and attraction to physical activity: the effectiveness of an intervention programme to enhance children's level of physical activity (Elizabeth Rose)
- David Kinsella: Acute physiological and performance effects of a high intensity in-season resistance training program on Australian rules footballers (Mike Newton, Mike McGuigan)
- Wing Yin Lau: Effect of vibration on eccentric exercise- induced muscle damage (Ken Nosaka)
- Greg Levin: The effect of concurrent strength and endurance training on physiological and performance parameters of cyclists" (Paul Laursen, Mike McGuigan)
- Karel Madou: Effect of whole body vibration training on functional performance of multiple sclerosis sufferers (John Cronin)
- Travis McMaster: A kinematic and kinetic comparison of pneumatic vs traditional resistance strength training devices in the lower body (John Cronin, Mike McGuigan)
- Cesar Meylan: Relationship between unilateral jump assessments and sport performance (John Cronin, Ken Nosaka)
- Roger Pegoraro: The validity and reliability of a fatiguing protocol to induce exercise-associated muscle cramp (Paul Laursen, Ken Nosaka, Greig Watson)
- Ben Piggott: The relationship between training load and the incidence of injury and illness over a pre-season at an Australian Football League Club (Mike McGuigan, Mike Newton)
- Sam Goh Shi Shien: Effects of lower body compression garments (Skins™) on submaximal and maximal running performance in hot and cold conditions in male recreational runners (Paul Laursen, Ken Nosaka)

Kyle Smith: Keeping the aged Healthy, happy and independent through physical and cognitive exercise (Darryl Turner, Rob Newton)

Melissa Tatasciore: The effects of resistance training interventions in obese children (Mike McGuigan)

Bradley Wall: The influence of progressive levels of dehydration on core temperature and endurance performance in well trained cyclists” (Paul Laursen, Greig Watson)

### **Honours students and their Research Projects (Supervisors)**

Lilian Chye: Modulation of corticomotor excitability during passive and active wrist flexion and extension (Ken Nosaka, Gary Thickbroom)

Dom Passalacqua: Effect of an Eastern spinal sequencing strategy to control and increase awareness of proximal movement initiation (John Cronin)

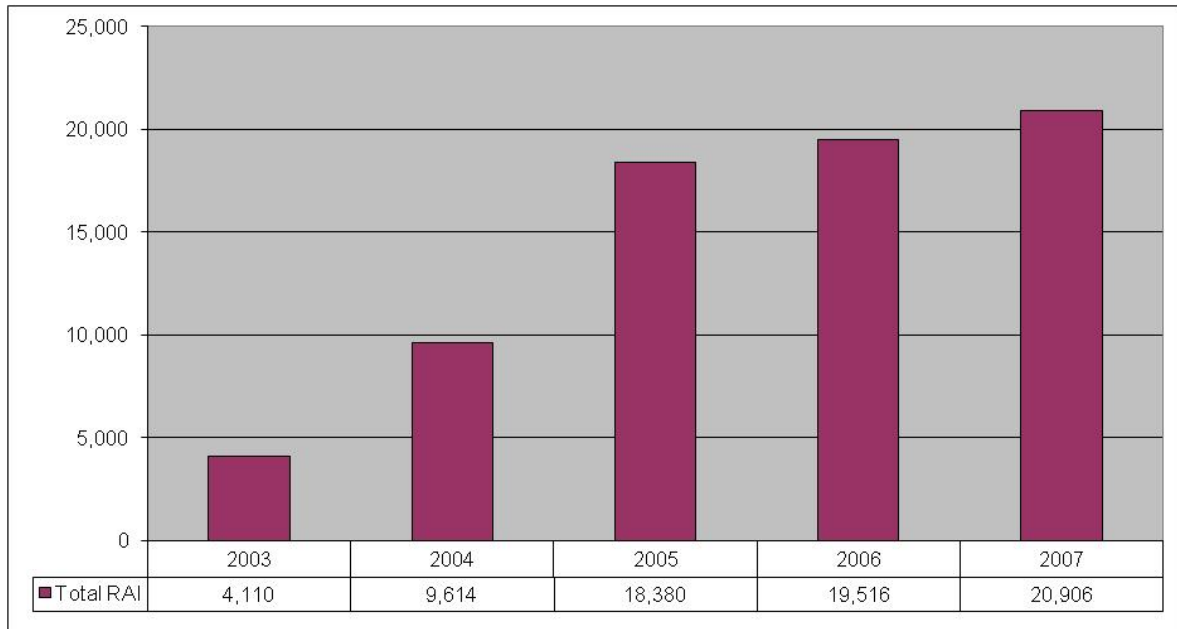
Cailyn Rogers: Assessment of static balance ability in an athletic pediatric population (John Cronin)

Tegan Robinson: The differences between children of high and low motor coordination in their physical self-description and attraction to physical activity (Elizabeth Rose)

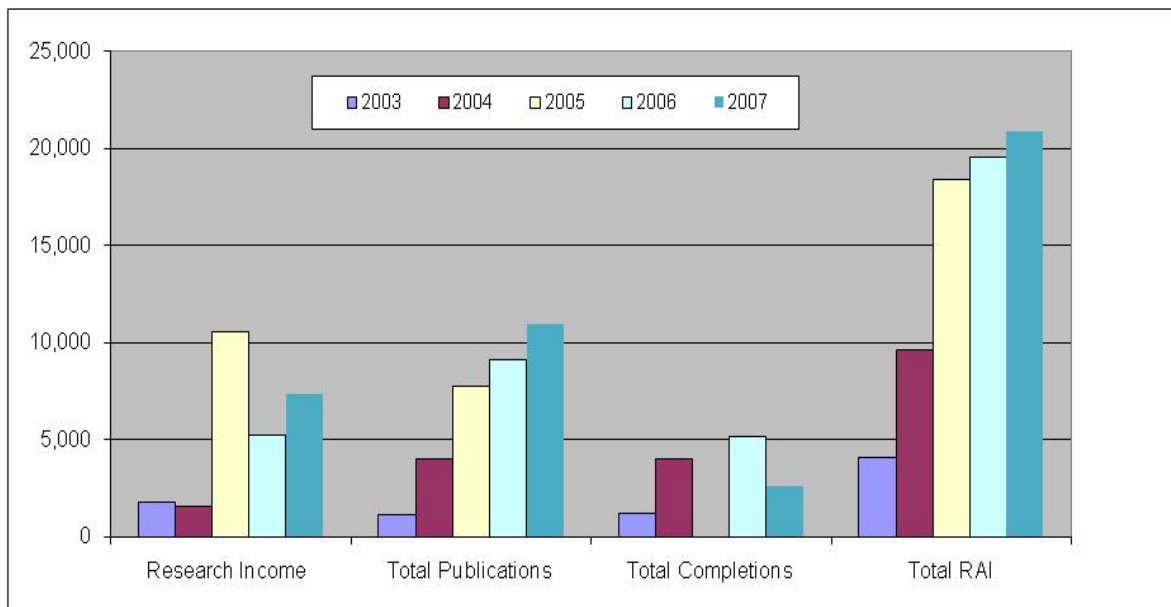
## **SUMMARY OF RESEARCH ACTIVITY**

Key performance indicators in terms of research productivity increased markedly between 2003, 2004, 2005 and 2006; this growth continued in 2007 although at a more modest rate. The total RAI for members of ESSRG increased by 134% from 2003 to 2004 and a further 91% from 2004 to 2005. This has flattened somewhat in 2006 with only a 6% rise in total research output however an increase was still evident. This rate of rise was maintained with a further increase of 7% between 2006 and 2007 for total RAI. Most of the increase between 2006 and 2007 was realised in publications (21%) and research income which increased by 41% to 7335 RAI points in 2007 after the decline of 51% in 2006. It is encouraging that research income is climbing back toward our record of 10591 points in 2005. Conference publications were down again (-77%) and this may be a reflection of the decreased emphasis by the University on this category of research output. HDR completions were down (-

50%) compared to the previous year. Total RAI Income for members of ESSRG for 2007 was \$43,065 (\$36,884 in 2006) which will be beneficial to the individuals to fund conference attendance, supplement postgraduate research projects, and staff research projects.



**Figure 1.** Total Research Activity Index points for 2003 to 2007 for members of ESSRG.



**Figure 2.** Research Activity Index points for 2003 to 2007 for members of ESSRG by output category.

## GRANTS AWARDED

*15 grants and \$554,480 in total*

1. Australian Rotary Health Research Fund. The Rotary Waist Disposal Challenge: Implementation and Evaluation of program. Principal Investigator: Samar Aoun, Co-Investigators: Jenny McDonnell, Robert Newton, Marilyn Barton, Jacque Heron. \$40,000
2. Cancer Council of Western Australia. Resistance and aerobic exercise for reducing treatment side-effects in men receiving ADT for prostate cancer. Principal Investigator: Daniel Galvão Co-Investigator: Robert Newton. \$24,600
3. Disability and the Arts; Disadvantaged and the Arts (DADA). The Lost Generation. (Community Collaborator). Investigators S. Flavell, S. Fox, E. Rose, and K. Cormack.
4. Edith Cowan University, Faculty of Computing and Health Science Small Grant. Games for Health – Motivating exercise through the use of computer games. Investigators Masek, M. P. Hingston, P.B. Laursen, K. Nosaka. \$4,954.
5. Edith Cowan University, Faculty of Computing and Health Science Small Grant. Do proinflammatory cytokines augment skeletal muscle damage in humans?. Investigators G. Watson, K. Nosaka, P.B. Laursen. \$5,000.
6. Edith Cowan University – Industry Collaboration Grant – The Rotary Waist Disposal Challenge: Implementation and evaluation of a lifestyle coaching program. Investigators S. Aoun, R. Newton, M. Newton. \$55,000
7. NHMRC Standard Equipment Grant. Telemeter Data Collection System for Electromyography, Goniometry and Accelerometer. Investigators Cronin, J.B. P.B. Laursen, R.U. Newton \$15,656.
8. NSCA Doctoral Student Graduate Research Grant. The Influence of Strength Level on the Ability to Adapt to Power Training. Chief investigators: Prue Cormie, Robert U. Newton, Michael McGuigan. \$6,250.
9. PATH Physical Activity Time for Health Professional: Community collaborator Investigators: I. Puddey, L. Beilin, K. Cox, and E. Rose.
10. Prostate Cancer Foundation of Australia. A randomized controlled trial of exercise to reduce co-morbidity in men receiving therapy for prostate cancer. Chief

Investigators: Robert U. Newton, Dennis Taaffe, Nigel Spry and Daniel Galvão. \$244,328

11. Sport and Recreation NZ. Design and assessment of a child-friendly community based resistance training programme for the treatment of obesity. Investigators A. Kilding, J. Cronin, G. Schofield and M. McGuigan. \$23,417.
12. The Cancer Council of Queensland. A randomized controlled trial of exercise to reduce treatment side-effects in men receiving therapy for prostate cancer. Chief Investigators: Robert U. Newton, Dennis Taaffe, Nigel Spry and Daniel Galvão. \$41,247.
13. The Cancer Council of Western Australia. A randomized controlled trial of exercise to reduce treatment side-effects in men receiving therapy for prostate cancer. Chief Investigators: Robert U. Newton, Dennis Taaffe, Nigel Spry and Daniel Galvão. \$70,000.
14. VibraQ Corporation Limited, WA. Effects of dynamic transdermal stimulation on delayed-onset muscle soreness (DOMS) and symptoms associated with eccentric exercise-induced muscle damage. Investigator Ken Nosaka. \$12,523.
15. West Coast Eagles Football Club. Monitoring of training in elite Australian Rules Football Players. Investigators: Michael McGuigan and Robert U. Newton. \$11,505.

## PUBLICATIONS

***47 journal publications in total***

1. Abbiss, C.R. and P.B. Laursen. Is part of the mystery surrounding fatigue complicated by context? *J. Sci. Med. Sport.* 10(5):277-9, 2007.
2. Abbiss, C.R., G. Levin, M.R. McGuigan and P.B. Laursen. Reliability of power output during dynamic cycling. *Int. J Sports Med.* Nov 30 [Epub ahead of print], 2007.
3. Abbiss, C.R., J.J. Peiffer, K.J. Netto and P.B. Laursen. Reliability of surface EMG measurements of the quadriceps during maximal isometric contractions following water immersion. *J Musculoskeletal Res.* 10(4), 197-203, 2007.

4. Abbiss, C.R., K. Nosaka, and P.B. Laursen. Hyperthermic-induced hyperventilation and associated respiratory alkalosis in humans. *Eur. J. Appl. Physiol.* 100(1):63-9, 2007.
5. Aziz, A.R., Newton, M.J., Kinugasa, T., and The, K.C. Relationship between aerobic fitness and league positional ranking of clubs in a professional soccer league over three competitive seasons. *Football Science*, 4: 9-18.
6. Baker, D. and R.U. Newton. Change in Power Output Across a High-Repetition Set of Bench Throws and Jump Squats in Highly Trained Athletes, *Journal of Strength and Conditioning Research*, 21(4): 1007-1011, 2007.
7. Bentley, D.J., G.R. Cox, D Green, and P.B. Laursen. Maximising performance in triathlon: Applied physiological and nutritional aspects of elite and non-elite competitions. *J Sci Med Sport*. Sep 12; [Epub ahead of print] 2007.
8. Bressel, E., Reeve, T., Parker, D. and Cronin, J. Influence of bicycle seat pressure on compression of the perineum: A MRI analysis. *Journal of Biomechanics*, 40, 198-202. 2007.
9. Brughelli, M. and Cronin, J. Altering the length-tension relationship with eccentric exercise: implications for performance and injury. *Sports Medicine*, 37(9), 807-826. 2007.
10. Buchheit M, P.B. Laursen, S. Ahmaidi. Parasympathetic reactivation after repeated sprint exercise. *Am. J. Physiol. Heart Circ. Physiol.* 293(1):H133-41, 2007.
11. Buchheit, M., P.B. Laursen, G.P. Millet, F. Pactat and S. Ahmaïdi. Predicting Intermittent Running Performance: Critical Velocity vs. Endurance Index. *Int. J. Sports Med.*, Sep 18; [Epub ahead of print], 2007.
12. Buchheit, M., Y. Papelier, P.B. Laursen and S. Ahmaidi. Noninvasive assessment of cardiac parasympathetic function: post-exercise heart rate recovery or heart rate variability? *Am J Physiol Heart Circ Physiol.* 293(1):H8-H10, 2007.
13. Burnett, A., Green, J., Netto, K. and Rodrigues, J. Examination of EMG normalisation methods for the study of the posterior and posterolateral neck muscles in healthy controls. *Journal of Electromyography and Kinesiology.* 17, 635-641. 2007.

14. Chapman, D., J. Peiffer, C.R. Abbiss, P.B. Laursen. A descriptive physical profile of Western Australian male paramedics. *J. Emergency Primary Health Care*. 5(1) Article Number: 990218, 2007.
15. Chen, T.C., and Nosaka, K. Intensity of initial eccentric exercise and the magnitude of repeated bout effect. *Journal of Applied Physiology* 102: 992-999, 2007.
16. Chen, T.C., Nosaka, K., and Tu, J.H. Changes in running economy following downhill running. *Journal of Sports Sciences* 25: 55-63, 2007.
17. Cronin, J., Jones, J. and Frost, D. The relationship between dry-land power measures and tumble turn velocity in elite swimmers. *The Journal of Swimming Research*. 17, 17-23. 2007.
18. Cronin, J., Jones, J. and Hagstrom, J. Kinematics and kinetics of the seated row and implications for conditioning. *Journal of Strength and Conditioning Research*, 21(4), 1265-1270. 2007.
19. Cronin, J., Nash, M. & Whatman, C. The effect of four different vibratory stimuli on dynamic range of motion of hamstrings. *Physical Therapy in Sport*, 8(1), 30-36. 2007.
20. Cronin, J., Ogden, T., Lawton, T. and Brughelli, M. Does increasing maximal strength improve sprint running performance? *Strength and Conditioning Journal*, 29(3), 86-95. 2007.
21. Cronin, J.B, Green, J.P., Levin, G.T., Brughelli, M.E. and Frost, D.M. The effect of starting stance on initial sprint performance. *Journal of Strength and Conditioning Research*, 21(3), 990-992. 2007.
22. Doan, B.K., R.U. Newton, W.J. Kraemer, Y-H. Kwon, and T.P. Scheet. Salivary cortisol, testosterone, and T/C ratio responses during a 36-hole golf competition. *International Journal of Sports Medicine*, 28: 28: 470-479, 2007.
23. Galvão D.A., Taaffe D.R., Spry N., Newton R.U. Exercise can prevent and even reverse adverse effects of androgen suppression treatment in men with prostate cancer. *Prostate Cancer and Prostatic Diseases*. 10: 340 – 346, 2007.
24. Harris, N., Cronin, J. and Hopkins, W. Power outputs of a machine jump-squat across a spectrum of loads. *Journal of Strength and Conditioning Research*, 21(4), 1260-1264. 2007.

25. Harris, N., Cronin, J. and Keogh, J. Contraction force specificity and its relationship to functional performance. *Journal of Sports Sciences*, 25(2), 201-212. 2007.
26. Hori, N., R.U. Newton, W.A. Andrews, N. Kawamori, M.R. McGuigan and K. Nosaka. Comparison of four different methods to measure power output during the hang power clean and the weighted jump squat. *Journal of Strength and Conditioning Research*, 21(2): 314-20. 2007.
27. Laursen, P.B., G.T. Francis, C.R. Abbiss, M.J. Newton and K. Nosaka. Reliability of time-to-exhaustion versus time-trial running tests in runners. *Med. Sci. Sports Exerc.* 39(8):1374-9, 2007.
28. Laursen, P.B., S.A. Marsh, D.G. Jenkins and J.S. Coombes. Manipulating training intensity and volume in already well-trained rats: Effect on skeletal muscle oxidative and glycolytic enzymes and buffering capacity. *Appl. Physiol. Nut. Metabol.* 32(3):434-442, 2007.
29. Lavender, A., and Nosaka, K. Fluctuations of isometric force after eccentric exercise of the elbow flexors of young, middle-aged, and old men. *European Journal of Applied Physiology* 100: 161-167, 2007.
30. Miyama, M., and Nosaka, K. Protection against muscle damage following 50 drop jumps conferred by 10 drop jumps. *Journal of Strength and Conditioning Research* 21: 1087-1092, 2007.
31. Netto, K., Burnett, A. and Coleman, J. Neck exercises compared to muscle activation during aerial combat manoeuvres. *Aviation, Space and Environmental Medicine.* 78, 478-484. 2007.
32. Newton, R.U. Does plyometric training improve vertical jump height? A meta-analytical review - Commentary. *British Journal of Sports Medicine.* 41(6): 355-355, 2007.
33. Nosaka, K. Muscle damage and amino acid supplementation: Does it aid recovery from muscle damage? *International SportMed Journal* 8: 54-67, 2007.
34. Nosaka, K., M. Muthalib, A. Lavender, and P.B. Laursen. Attenuation of muscle damage following muscle hyperthermia one-day prior to eccentric exercise. *Eur. J. Appl. Physiol.* 99(2):183-92, 2007.

35. Nosaka, K., Muthalib M., Lavender, A., Newton. M., and Sacco, P. Attenuation of muscle damage by muscle hyperthermia one-day prior to eccentric exercise. *European Journal of Applied Physiology* 99: 183-192, 2007.
36. Nottle, C., and Nosaka, K. Changes in power assessed by the Wingate Anaerobic Test following downhill running. *Journal of Strength and Conditioning Research* 21: 145-150, 2007.
37. Peake, J., J.J. Peiffer, C.R. Abbiss, K. Nosaka, M. Okutsu, P.B. Laursen and K. Suzuki. Body temperature and its effect on leukocyte mobilization, cytokines and markers of neutrophil activation during and after exercise. *Eur. J. Appl. Physiol.* Oct 26; [Epub ahead of print], 2007.
38. Pearson, S., Hume, P, Slyfield, D. And Cronin, J. External work and peak power are reliable measures of ergometer grinding performance when tested under load, deck heel, and grinding direction conditions. *Sports Biomechanics*, 6(1): 71-80. 2007.
39. Peiffer J.J, C.R. Abbiss, P.B. Laursen, and K. Nosaka. Reliability of femoral blood vessel diameter measurement by B-mode ultrasonography. *JEPonline*. 10(4): 10-16, 2007.
40. Peiffer J.J., C.R. Abbiss, K. Nosaka, J.M. Peake and P.B. Laursen. Effect of cold water immersion after exercise in the heat on muscle function, body temperatures, and vessel diameter. *J. Sci Med Sport*, Dec 14; [Epub ahead of print], 2007.
41. Ratamess, N.A., W.J. Kraemer, J.S. Volek, D.N. French, M.R. Rubin, A.L. Gómez, R.U. Newton and C.M. Maresh. The Effects of Ten Weeks of Resistance and Combined Plyometric/Sprint Training With the Meridian Elyte Athletic Shoe on Muscular Performance in Women. *The Journal of Strength and Conditioning Research*, 21(3): 882–887, 2007.
42. Rose, E. and Larkin, D. Movement confidence: Implications of enjoyment and harm for girls and boys. *Malaysian Journal of Sports Science and Recreation*, 3(4), 17-26. 2007.
43. Sheppard, J.M., Newton, R.U., & McGuigan, M.R. The effect of accentuated eccentric load on jump kinetics in high-performance volleyball players. *International Journal of Sports Science & Coaching*, 2(3): 267-273, 2007.

44. Singh, F., Foster, C., Tod, D. and McGuigan, M.R. Monitoring different types of resistance training using session rating of perceived exertion. *International Journal of Sports Physiology and Performance*. 2: 34-45. 2007.
45. Stalboom, M., Holm, D.J., Cronin, J.B. and Keogh, J.W.L. Reliability of kinematics and kinetics associated with horizontal single leg drop jump assessment. A brief report. *Journal of Sports Science and Medicine*, 6, 261-264. 2007.
46. Taaffe DR, Galvão DA, Sharman JE, Coombes JS. Reduced central blood pressure in older adults following progressive resistance training. *J Hum Hypertens*. Jan;21(1):96-8. 2007.
47. Takashima, W., Ishii, K., Takizawa, K., Yamaguchi, T., and Nosaka, K. Muscle damage and soreness following 50-km cross-country ski race. *European Journal of Sports Science* 7: 27-33, 2007.

## CONFERENCE PRESENTATIONS

**39 conference presentations in total**

### Invited Presentations

1. Newton, R.U. Exercise and Nutrition for Health and Happiness. *St Mary's Anglican Girls School – Staff Development Day*, 5th February, 2007.
2. Newton, R.U. Lifestyle for prevention and management of Alzheimer's Disease. *Ask the Expert - Alzheimer's Australia WA*, 19th February, 2007.
3. Newton, R.U. Exercise as Medicine for Cancer. *Prostate Cancer Foundation of Australia – Men's Health Promotion Forum*, Sydney, 22nd September 2007.
4. Newton, R.U. Exercise as Medicine for Cancer. *Prostate Cancer Foundation of Australia – Men's Health Promotion Forum*, Hobart, 9th August 2007.
5. Newton, R.U. Exercise as Medicine for Cancer. *Prostate Cancer Foundation of Australia – Men's Health Promotion Forum*, Perth, 16th June 2007.
6. Newton, R.U. Exercise as Medicine. *Clinical Seminar Series*, Sir Charles Gairdner Hospital, 24th March, 2007.
7. Newton, R.U. Exercise Benefits Cancer Patients. *Leukaemia Foundation of Australia Conference*, Perth, 16th July 2007.
8. Newton, R.U. Exercise, Lifestyle and MS. *MS Australia National Seminar Series*. Sydney 9th June 2007.

9. Newton, R.U. Exercise, Lifestyle and MS. *MS Australia National Seminar Series*. Melbourne 8th June 2007.
10. Nosaka, K. Does muscle adaptation require inflammation? (No pain, No gain?) *8th International Society of Exercise and Immunology Symposium*. Sendai, Japan 25-27, October. 2007.
11. Rose, E, Howard, B, Larkin, D, Hands, B, Parker, H. Exploration of potential relationships among attraction towards physical activity, self-concept, and level of physical activity, *Asian Sport Psychology Association*, Bangkok, Thailand, 2007.

#### **Refereed Conference Proceedings and Abstracts**

12. Berger, B., Hanrahan, S., Howard, B., Rose, E., Larkin, D, Hands, B., Parker, H., MacCracken, M., & Stadulis, R. Advances in physical activity and well-being: International perspectives. *Proceedings of the Joint Congress of SEA Games and ASEAN Para Games Scientific Congress: Joint SEA Games and ASEAN Para Games Scientific Congress*. Asian South Pacific Association of Sport Psychology, 145-147. 2007.
13. Buchheit M., Millet G.P., Parisy A., Pourchez S., P. Laursen and S. Ahmaidi. Supramaximal training and post-exercise parasympathetic reactivation in adolescents. *12th International ACAPS Conference*, 31 Oct - 2 Nov 2007, Leuven, Belgium.
14. Chen, T.C., Chung, C-J., Chen, H-L., and Nosaka, K. Protective effect produced by low intensity lengthening or maximal isometric contractions against maximal lengthening contractions. *12th Annual Congress of the European College of Sports Science*. Jyväskylä, Finland 11-14, July. 2007.
15. Cronin, J. and Frost, D. Stepping backwards improves sprint performance over short distances. *Sport and Exercise Science New Zealand Conference*, Hamilton, Nov. 8-10<sup>th</sup>, 2007.
16. Edwards, C., Tod, D. and McGuigan, M.R. The effect of self-talk on power production during the vertical jump test in university rugby union players. *National Strength and Conditioning Association National Conference*. Atlanta, GA, July 13, 2007. *Journal of Strength and Conditioning Research*. 21(4): E31. 2007.
17. Ferri, A., G. Watson, P. Laursen, B. Grassi, G. Misericchi, D. Bishop. Influence of muscle fiber composition on oxygen uptake kinetics. *American College of Sports*

- Medicine Annual Meeting*, New Orleans. 31 May – 3 June, 2007. *Med Sci Sports Exerc.* 2007 May;39 (5 Suppl):S359
18. Galvão DA., Nosaka K., Taaffe DR., Spry N., Kristjanson L., Suzuki K, Peake J, McGuigan MR., Newton RU. Endocrine responses to resistance training in prostate cancer patients undergoing androgen deprivation therapy. *Western Australia Cancer Council Symposium*, Perth, Western Australia, 29th March, Australia, 2007.
  19. Hands, B., Larkin, D., Rose, E., Parker, H., Sloan, N., & Kendall, G. The impact of sex and motor competence on health related fitness. *International Society for Adapted Physical Activity*, San Claro Brazil, July, 2007.
  20. Hands, B., Parker., H., Larkin, D., & Rose, E. Children taking control of their own physical activity level. *ACHPER 25th National/International Biennial Conference*, Fremantle, 2007.
  21. Harris, N., Cronin, J., and Hopkins, W. Squat jump training at maximal power – does it improve sprint ability. *Sport and Exercise Science New Zealand Conference*, Hamilton, Nov. 8-10<sup>th</sup>, 2007.
  22. Hinton, B., Quinn, J., Newton, M., and McGuigan, M. Effects of whole-body vibration and PNF stretching on the flexibility and range of movement in elite Australian Rules football players. *Journal of Sports Science and Medicine Suppl.* 10 : 22, 2007.
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  25. McGuigan, M.R. and Tod, D. Monitoring strength training and performance: Practical and psychological applications. *National Strength and Conditioning Association National Conference.* Atlanta, GA, July 13, 2007.

26. Nosaka, K., Newton, M., and Sacco, P. Comparison between arms for responses to a bout of maximal eccentric exercise of the elbow flexors. *12th Annual Congress of the European College of Sports Science*. Jyvaskyla, Finland 11-14, July. 2007.
27. Pearson, S., Cronin, J., Hume, P., & Slyfield, D. Kinematics and kinetics of the bench press and bench pull exercises in a strength-trained sporting population. *25th International Symposium on Biomechanics in Sports*, Ouro Preto, Brazil. Eds: Menzel, H-J., Chagas, M.H. August 23-27, 2007.
28. Pearson, S., Cronin, J., Hume, S. and Slyfield, D. (2007). Bench press vs bench pull – kinematics, kinetics and 1RM determination. *Sport and Exercise Science New Zealand Conference*, Hamilton, Nov. 8-10<sup>th</sup>, 2007.
29. Rose, E., Howard, B., Larkin, D. Hands, B., & Parker, H. Does attraction towards physical activity influence self-concept on level of physical activity in children? *Proceedings of the Joint Congress of SEA Games and ASEAN Para Games Scientific Congress: Joint SEA Games and ASEAN Para Games Scientific Congress Asian South Pacific Association of Sport Psychology*, 151-154, 2007.
30. Rose, E., Howard, B., Larkin, D., Hands, B., & Parker, H. Exploration of potential relationships among attraction towards physical activity, self-concept, and level of physical activity, *Asian Sport Psychology Association*, Bangkok, Thailand, November, 2007.
31. Rose, E., Larkin, D., Hands, B., Sloan, N., Parker, H., & Kendall, Garth. Psycho-social aspects of low motor competence in adolescents. *International Society for Adapted Physical Activity*, San Claro Brazil, July, 2007.
32. Sheehy, K.M., Hopkins, W.G. and Cronin, J.B. (2007). Short-term enhancement of weight training on softball throwing velocity. *Sport and Exercise Science New Zealand Conference*, Hamilton, Nov. 8-10<sup>th</sup>, 2007.
33. Sheppard, J.M., Cronin, J., Gabbett, T.J., McGuigan, M.R., Etxebarria, N., and Newton, R.U. Relative importance of strength, power and anthropometric measures to jump performance of elite volleyball players. *National Strength and Conditioning Conference*, Atlanta, Georgia, July, 2007. *Journal of Strength and Conditioning Research*. 21(4): E19. 2007.
34. Sheppard, J.M., Cronin, J.B., Gabbett, T.J., McGuigan, M.R. and Newton, R.U. Relative importance of strength and power qualities to jump performance in elite

- volleyball players. *National Strength and Conditioning Conference*, Atlanta, Georgia, July, 2007.
35. Tod, D., Baker, J. and McGuigan, M.R. The effects of psyching-up and a passive warm-up on muscular strength and fatigue. *12th European Congress of Sport Psychology*, Halkidiki, Greece, September 2007.
36. Tod, D., Thatcher, R., McGuigan, M.R., and Thatcher, J. The effect of instructional and motivational self-talk on performance and the kinematics of the vertical jump. *12th European Congress of Sport Psychology*, Halkidiki, Greece, September 2007.
37. Wallis, K.L., Newton, R.U., Mohamad, S., McGuigan, M.R. and Tan, E. Tracking the effect of a 10 week resistance training program on single leg power in elite sprint and endurance track cyclists. *National Strength and Conditioning Conference*, Atlanta, Georgia, July, 2007. *Journal of Strength and Conditioning Research*. 21(4): E33. 2007.
38. Watson, G., Laursen, P., Nosaka, K., Abbiss, C., and Bradley, W. Hyperthermic fatigue precedes a rapid reduction of serum sodium and cramping in an Ironman triathlete. *12th Annual Congress of the European College of Sports Science*. Jyvaskyla, Finland 11-14, July. 2007.
39. Whatman, C., Nash, M. and Cronin, J. (2007). The acute effect of stretching and vibration on knee joint range of motion and jump performance. *Sport and Exercise Science New Zealand Conference*, Hamilton, Nov. 8-10<sup>th</sup>, 2007.

## REPORTS

1. Hume, P.A., Cronin, J., Croft, J. and Pearson, S., White, K. Progress Report Zephyr Technology Project #1: Shoe Pod. A Technical Report for Zephyr Technology Limited. May 2007. 2 pages.
2. Nosaka, K. and Wing Yin Lau. Effects of dynamic transdermal stimulation on delayed-onset muscle soreness (DOMS) and symptoms associated with eccentric exercise-induced muscle damage. Final report to the funding body (VibraQ Co. Ltd.). December 2007.
3. Nosaka, K. Development of Methods to Assess Standing Fatigue. Final report to the funding body (Taisho Pharmaceutical Co. Ltd.). August 2007.

## BOOKS

1. Hands, B., Parker, H., Rose, E., Larkin, D., & Geneff, R. *Play 5 Teacher manual: Get active at home and school*. Australian Council of Health Physical Education and Recreation Publications: Hindmarsh, S.A. 2007.
2. Pratt, S., Newton, R.U., Galvao D.A., Hope, P., McGuigan, M.P. *Guidelines for Implementing Exercise Programs for Cancer Patients*, The Cancer Council Western Australia, Perth Australia, ISBN 1876628790. September 2007.

## BOOK CHAPTERS

1. Hands, B., Parker, H., Rose, E., Larkin, D., & Geneff, R. *Play 5 Teacher manual: Get active at home and school*. Australian Council of Health Physical Education and Recreation Publications: Hindmarsh, S.A. 2007.

## AWARDS

1. Daniel A. Galvão. 2007 The Cancer Council of Western Australia Earlier Career Investigator Award.
2. Mike McGuigan, 2007 National Strength and Conditioning Association - Outstanding Young Investigator Award.

## RESEARCH STUDENT COMPLETIONS

### Graduating Honours Students

1. Cailyn Rogers – “Assessment of static balance ability in an athletic pediatric population”. (Supervisor John Cronin)

### Graduating Masters Students

2. Barbara Howard - “Self-Concept and attraction to physical activity: The Effectiveness of an intervention programme to enhance children's level of physical activity”. (Supervisor Elizabeth Rose).
3. Bradley Wall – “Effects of exercise-induced hypohydration on body temperature and cycling time-trial performance in the heat with adequate facing windspeed” (Supervisors Paul Laursen, Greig Watson).

4. David Frost – “Air versus mass: Comparison of the kinetics, kinematics and muscle activity between pneumatic and free weight resistance.” (Supervisors Robert Newton and John Cronin).
5. Greg Levin – “The influence of concurrent strength and endurance training on cycling performance and physiological variables” (Supervisors Paul Laursen, Mike McGuigan)
6. Tasuku Fujikake - “Detection of muscle damage by B-mode ultrasonography: Relationship between echo intensity and histological changes following injection of bupivacaine to rat hind limb muscles”. (Supervisor Ken Nosaka).
7. Trevor Farr - “Effects of Hypoxia on Exercise Induced Muscle Damage”. (Supervisor Barry Gibson).

### **Graduating PhD Students**

8. Daniel Baker “A Series of Studies on Professional rugby league players”. Supervisor Robert Newton.
9. Kevin Netto “Neck Loading in High Performance Combat Pilots during Aerial Combat Manoeuvres and Specific Neck Strengthening Exercises” (Supervisor Angus Burnett).
10. Michael Newton “An investigation into the effect of arm-choice, training status, and selected racial variance on eccentric exercise- induced muscle damage and soreness.” (Supervisor Ken Nosaka).
11. Naruhiro Hori “Efficacy of weight lifting exercise on the biomechanics of jump, sprint and change of direction performance.” (Supervisors Robert Newton and Ken Nosaka).

### **EXPERT EVALUATIONS OF ACADEMIC THESES**

1. Ken Nosaka. Examination of Doctor of Philosophy Thesis, Jodi Lee Richardson, Monash University. Thesis topic: “Determining the effectiveness of eccentric exercise training to protect hamstring muscles against injury and soreness”, June 2007.
2. Ken Nosaka. Examination of Doctor of Philosophy Thesis, Maarit Lehti, University of Jyväskylä (Finland). Thesis topic: “Physical exercise and type 1 diabetes induced structural adaptations in skeletal muscle”, May 2007.

3. Ken Nosaka. Examination of Doctor of Philosophy Thesis, Sirous Ahmadi, University of Sydney. Thesis topic: "Monitoring muscle oxygenation and blood flow after damage-inducing exercise", November 2007.
4. Ken Nosaka. Examination of Honours Thesis, Cailyn Rogers, Edith Cowan University. Thesis topic: "Assessment of static balance ability in an athletic pediatric population", November 2007.
5. Mike McGuigan, Examination of Honours Thesis, Pauline See, RMIT, "The effects of eccentric resistance training on muscle architecture and force-velocity characteristics", November 2007.
6. Robert Newton, Examination of Doctor of Philosophy Thesis, Ross Allan Clark, Central Queensland University. Thesis topic: "The potential for variable range of motion training to optimise functional performance." December 2007.
7. Robert Newton, Examination of Doctor of Philosophy Thesis, Timothy Henwood, University of Queensland. Thesis topic: "Muscle functional and functional ability in resistance trained older adults." December 2007.

## **STRATEGIC RESEARCH ALLIANCES**

Appalachian State University (USA)

Australian Institute of Aviation Medicine

Australian Institute of Sport

Centre for Neuromuscular and Neurological Disorders (UWA)

Clinical Associate Professor Nigel Spry (University of Western Australia))

Cycling Australia

Dept of Exercise Science and Human Movement (UWA)

Disability and the Arts: Disadvantage and the Arts Western Australia

Dr David T. Martin – Australian Institute of Sport

Dr Jonathan Peake (University of Queensland)

Dr. Bill Sheel (University of British Columbia, Canada)

Dr. Dennis R. Taaffe (The University of Queensland)

Dr. Di Hooper (Curtin University)

Dr. Helen Slater (Curtin University)

Dr. Katsuhiko Suzuki (Waseda University, Japan)

Dr. Katsuhiko Suzuki (Waseda University, Japan)

Dr. Maffioletti (Université de Bourgogne, France)

Dr. Thanasis Jamurtas (University of Thessaly, Greece)

Dr. Trevor Chen (National Chiayi University, Taiwan)

No 79 Squadron RAAF Pearce

Prof Kamal Alameh – COMPS, ECU

Recreation Network. Western Australia: Department of Sports and Recreation

School of Physiotherapy (Curtin)

Singapore Sport School

Star Sport Alliance – Auckland University of Technology

STAR Sport Alliance. MOU signed between AUT and ECU. Other members of Alliance – Singapore Sports School, Bath University, Leeds Metropolitan University and University of Wales in Cardiff.

The College of New Jersey (USA)

United States Air Force

United States Olympic Training Centre (USA)

United States Ski and Snowboard Association (USA)

University of Calgary

University of Connecticut (USA)

University of Edinburgh (UK)

University of Massachusetts (USA)

University of New Mexico (USA)

University of Notre Dame, Australia, Department of Sport and Recreation

University of Verona

University of Wales in Cardiff

West Australian Institute of Sport

Yokohama City University (Japan)

## **VISITING RESEARCH FELLOWS**

Dr Martin Buchheit. Research Laboratory, EA 3300, Laboratory of Exercise Physiology and Rehabilitation, Faculty of Sport Sciences, University of Picardie, Jules Verne, 80025, Amiens, France.

Dr. Marc Jubeau - Faculty of Sports Science University of Burgundy (France)

Dr. Guillaume Millet - PPEH Research Unity, University Jean Monnet (France)

## **APPOINTMENTS TO BOARDS OR EXTERNAL COMMITTEES**

Assoc. Prof. John Cronin

- Physical Conditioning Committee – Sport and Exercise Science NZ

Dr. Daniel Galvão

- The Open Clinical Cancer Journal, Editorial Board

Assoc. Prof. Professor Barry Gibson

- Member of Curriculum Council - Outdoor Education Committee

Dr. Paul Laursen

- Journal of Science and Medicine in Sport; Editorial Board Member
- Journal of Strength and Conditioning Research; Editorial Board Member.

Dr Mike McGuigan

- National Sport Science Quality Assurance Strength-Power Working Group, Australian Institute of Sport
- Associate Editor, Journal of Strength and Conditioning Research

Professor Robert Newton

- Healthway - Research Committee.
- Technical Reference Group, National Children's Nutrition and Physical Activity Survey, Australian Government Department of Health and Ageing
- National Obesity Taskforce – Scientific Reference Group
- Australian Association for Exercise and Sports Science, University Accreditation (NUCAP) committee.
- AVCC Athlete Education Committee
- International Journal of Sports and Health Science, Associate Editor.
- Journal of Strength and Conditioning Research, Associate Editor
- Board of the Western Australian Centre for Cancer and Palliative Care

Assoc. Prof. Ken Nosaka

- International Journal of Sports and Health Science, Associate Editor.
- Journal of Science and Medicine in Sport, Editorial Board.
- Japanese Training Science Association, Editorial Board.

- Medicine and Science in Sports and Exercise, Editorial Board.

Dr. Elizabeth Rose:

- Adapted Physical Activity – International Federation for Adapted Physical Activity
- Adapted Physical Activity Quarterly. Editorial Board
- Malaysian Journal of Sports Science and Recreation, Editorial Board
- Recreation Network: Department of Sport and Recreation
- Fitness Institute of Western Australia

## **MEDIA COVERAGE**

1. Daniel A. Galvão - Channel 10 - News - Exercise helps fight prostate cancer. April 2007.
2. Daniel A. Galvão - Hematology Oncology Today (USA) - Clinical News in Oncology and Hematology, April 2007. Volume 8 (4) - Interview.
3. Daniel A. Galvão - Joondalup Times - Recipient of the Cancer Council WA Pearl Bethel Allan Early Career investigator grant scheme, 29 March 2007.
4. Daniel A. Galvão and Robert U. Newton - The Cancer Council of Western Australia Newsletter 1 March 2007.
5. Daniel A. Galvão and Robert U. Newton - The Cancer Council of Western Australia Newsletter 1 August 2007.
6. Daniel A. Galvão and Robert U. Newton - The West Australian "Exercise helps fight prostate cancer" - 4 April 2007.
7. Mike McGuigan, 24th October 2007 ABC Radio Southwest "Childhood Obesity"
8. Paul Laursen - January 2007. "Water: how much is too much for endurance athletes?" (Paul Rogers) *Fitness: Health and fitness for life*.
9. Paul Laursen - November 2007. *ECUupdate Alumni News*. "Reaching New Heights with Research", p3.
10. Paul Laursen - October 2, 2007. *Inside ECU*. "ECU Researchers on top of the world".
11. Paul Laursen - October 2007. *The Ultimate Interval* (Ian Dille) *Bicycling*.
12. Paul Laursen - October 29, 2007. *ScienceNetwork WA*. "Researchers at the top of the world".

13. Robert Newton - ABC Southwest Radio, 23rd October 2007, Exercise and ageing. Live interview.
14. Robert Newton - HBF Magazine, "Exercise Benefits and Tips", 30th October 2007.
15. Robert Newton - Medical Observer, 5th October 2007, Exercise has high impact on survival.
16. Robert Newton - The West Australian, 24th October 2007, Unsung Heroes.
17. Robert Newton - Weekend Australian Magazine, "Changing Gear" on latest sports garments. November 2007.

## PATENTS

1. Laursen, P.B., K. Alameh, M. Newton and M.J. Quod. Creation of a 'smart' lightweight heat-transfer fabric to control human body temperature using microphotonics technology. Australian Provisional Patent (April 2007).

