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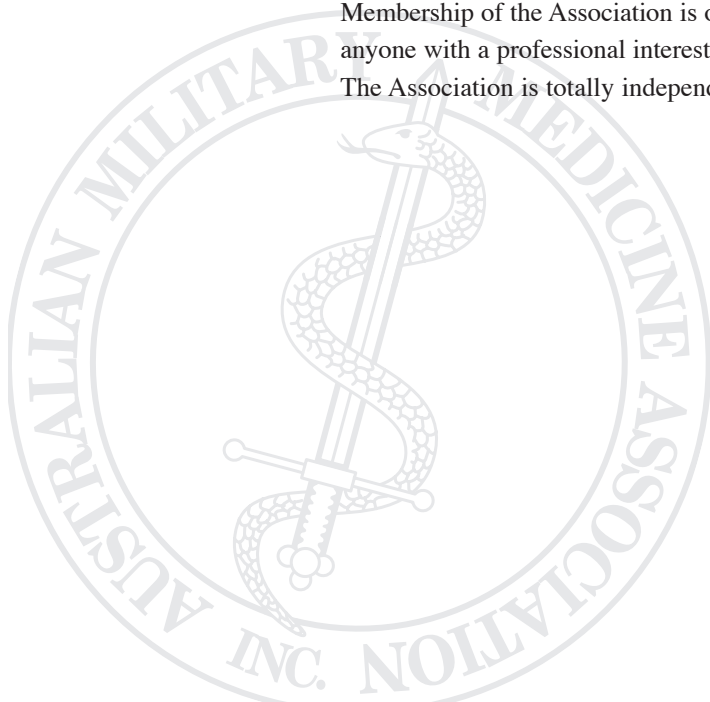
STATEMENT OF OBJECTIVES

The Australian Military Medicine Association is an independent, professional scientific organisation of health professionals with the objectives of:

- promoting the study of military medicine
- bringing together those with an interest in military medicine
- disseminating knowledge of military medicine
- publishing and distributing a journal in military medicine
- promoting research in military medicine

Membership of the Association is open to doctors, dentists, nurses, pharmacists, paramedics and anyone with a professional interest in any of the disciplines of military medicine.

The Association is totally independent of the Australian Defence Force.



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This edition of the AMMA journal should be read in conjunction with the 2006 Defence Health Services/Australian Military Medicine Association Conference Program (see insert). Each abstract is listed in order of presentation. Where there are multiple authors, the presenter's name is marked with an asterik.

Some abstracts are not listed as these were not available at time of printing – these are marked with an asterisk in the program.

TABLE OF CONTENTS

EDITORIAL	4
CONFERENCE ABSTRACTS – PRESENTATION	
The Emotional and Behavioural Challenges of Pandemic Situations - H Holloway.....	7
Operational Mental Health - The Challenge to Finding the Facts - G. Larkin	7
The Nursing Management of the Intoxicated Patient: A Rural Perspective - SC Mangion.....	8
“I’m an Australian, Get me out of here.” Health Support to the Lebanon Evacuation - T Smart, D Mitchell	8
‘Naturally-functional foods’: Roles for Molecular Composition and Food Architecture - M Gidley	9
Determining Optimal Operational Duration from a Mental Health Perspective - JR Swann.....	9
Health Intelligence Challenges in the Australian Defence Force - T Warwarek.....	9
The Recently-Devised Australian and New Zealand Nutrient Reference Values (NRV) and the Possible Development of ADF-Specific NRV - C Forbes-Ewan*, K Baghurst	10
The Australian Defence Force Response to the 08 Oct 05 Asian Earthquake - KL Leshinskas*, A Dines.....	10
Transitioning from Civilian to Military Life: Building Resilience in Army and Royal Australian Navy Recruits J Watkins, M Goodman*.....	11
Treating Nicotine Dependence: The Nurse’s Role - D Harrison.....	11
Dietary Intake And Health Implications For Navy Personnel - RA Coad*, PJ Probert.....	11
Operation Pakistan Assist – Lessons Learned for Future Provision of Humanitarian Aid by the ADF P McGinty, TC Jongeneel, SJ Barry*, SM Sawyer, P Lonergan.....	12
Screening for Psychological Changes Throughout A Military Deployment: Australian Defence Force Personnel In The 2003 Gulf War - N Bennett, N Sadler*.....	12
What is the Effectiveness of Lung Assist Devices in Blast Lung Injury: A Literature Review - BR Mackie.....	13
Nutritional Requirements of Soldiers Engaged in Infantry Initial Employment Training - C Forbes-Ewan	13
Environmental Health Challenges Faced During Operation Pakistan Assist Nov 05 – Apr 06 - TRG Strickland.....	14
Psychological Support To Deployed Forces: A Review Of Intervention During Operation Sumatra Assist N Bennett, NJ Sadler*.....	14
Nursing – The Invisible Profession - B Wright	14
Complex Carbohydrates and Gut Health - D Topping	15
Prevalence Of Obstructive Sleep Apnoea In The ADF – Preliminary Study: Use Of a Questionnaire to Screen Individuals at Risk of Moderate to Severe Obstructive Sleep Apnoea - Dr M Lakos	15
Psychological Screening after Operation Catalyst: Trends, Questions and Future Directions - A Kaine*, N Steele, S Hodson, A Twomey	16
Leadership and Management Support for ADF Nursing Officers - E Tracy*, J Finucane*, T Carthew*	16
Obstructive Sleep Apnoea: A Referral Profile in Defence Personnel - MCF Pain*, H Teichtahl	16
The Acute Mental Health on Operation (AMHOO) Course - J Wardell*, D Clark.....	17
The Challenges of Nursing in The Army INTERFET 1999 To OP ASTUTE 2006 - D J Wade.....	17
Joint Health Planning and Operations in the Australian Defence Force – Theory vs Practice - AJI Dines	18
Endemic and Epidemic Substance Abuse in the Military: What does the past tell us about the future - H Holloway	18
Australian Defence Force Nursing Undergraduate Scheme – Are We Getting It Right? - A Craig	18
Preparing Communities for Disasters: The Role of Environmental Health Professionals - BA Ferrier, JT Spricket	19
Pertussis Outbreak in the Liverpool Military Area – A case study of infection control procedures during an infectious disease outbreak. - L Loughheed*, M Lakos	19
Medical Leadership in the Military – Rank Should Not Always Have Its Privileges - T Austin.....	20
Why Can’t We All Just Get Along? The Doctor Nurse Relationship in the ADF - TL Smart.....	20
Preventing genital HPV infection and associated diseases by vaccination - rof. Ian Frazer	20
Genesis of Malaria Epidemics and its Impact on Military and Humanitarian Operations - GD Shanks	21
The Effect of Other Deployments in Assessing the Health of Australian Gulf War Veterans HL Kelsall*, JF Ikin, DP McKenzie, DC Glass, AB Forbes, MR Sim.....	21
Critical Care in the Air: Training Civilian Specialists for Military AME - J Lumsden, K Douglas.....	22
Time and Space – Relativity in Trauma - WM Griggs.....	22
Clinical Trials Using Antimalarial Drugs at the Army Malaria Institute 1998-2004 - GD Shanks	23
Mortality and Cancer Incidence amongst Australian National Service Vietnam War Veterans EJ Wilson*, KWA Horsley, R Van der Hoek.....	23
Medical Officer Specialist Training in the Defence Health Services - IJ Young.....	24
Blast Trauma from an Australian Perspective and Possible Ramifications for Australian Defence Force Health Personnel - DA Andrew -	24

Soldier's Use of personal Protective measures Against Arthropodbites and Arthropod-associated Disease: A Survey among Canadian Force Members Deployed in Kabul, Afghanistan in 2005 - F Crane*, M Tepper, B Strauss, J Whitehead, S Schofield.....	25
Continuing Competence to Practice - A Challenge for Defence Force Nursing Officers - EA Davies.....	25
Wound Management in Injuries from Blows, Bullets, and Blasts - PF Sharwood	26
Can We Improve Compliance with Primaquine and reduce the incidence of P. vivax malaria in the ADF? SM Bennett*, NJ Elmes, PE Nasveld, TL Carthew, KH Rieckman	26
Cancer Incidence and Mortality in Aircraft Maintenance Workers C D'Este*, J Attia, A Brown, R Gibson, R Gibberd, M Tavener, M Guest, K Horsley, W Harrex, J Ross.....	27
Training and Credentialing the Military General Surgeon for the Australian Defence Force - J Rosenfeld	27
Challenges in Reconstruction of Massive Oromandibular Defects - A Bath.....	27
National Coordination for Mental Health Response to Terrorism and Disaster - B Raphael.....	28
The Severly Burned Patient: A Guide to Assessment, Frist Aid, Resuscitation, Surgical and Non-Surgical Wound Care - P Maitz.....	28
Leadership and Lobbying - W Glasson	28
US Military Medical Response to Recent Natural Disasters and the Need for Rapid Response Medical Teams T Burkhard*, P Breed	29
Planning to Deliver Operational Medical Support in the Future – the UK Approach - M Von Bertele	29
The Problem that is too often Ignored: The Prevalence of Mental Health Disorders in Military Personel - A. Mcfarlane...	30
Resilience and Job Adjustment in RAAF ATC Officer Employment: An Exploratory Study - SJ Elliott	30
The Effects of Hypobaric Hypoxia on Pure Tone Audiometric Thresholds - K Datta.....	31
The Australian Defence Force Deployed Health Surveillance Program at the Centre for Military and Veterans' Health - S Kitchener	31
Age Estimation at Time of Death - M Blenkin*, W Evans	31
Heal Thy Self? - The Personal Mental Health Challenges Faced by Military Health Professionals - M Suen*, SE Hodson, N Bennett.....	32
The Characterisation and Referral of Severe Trauma in North Queensland. Implications for Military Medical Units Operating in Isolated Areas - A McDonnell*, P Aitken, M Elcock, C Vietch.....	32
Roadmap for the Deployment Health Surveillance Program - JA Ross	33
A Revised System of Metrics for Clinical Services and Epidemiology for the Australian Defence Force Dental Service - AJ Draper*, SJ Curry	33
Mental and Spiritual Wellbeing of Chaplains in the ADF - A Phelps.....	34
Hurricane Katrina – A personal survivors viewpoint - RF Curtis.....	34
Provision of Quality Health Care to Defence Members – A Collaborative Model to Provide a Quality In-barracks and Deployable Health Capability - M Lakos	35
Preliminary Results of the Case Control Dental Study on Dental risk Factors and Unscheduled Dental Visits - GD Mahoney*, G Slade, S Kitchener.....	35
Developing Innovative Models of Patient Care Delivery: Defining Success - M Chiarella	35
Deployment Health Research – Where to Next - M Sim.....	36
Application of Models of Occupational Stress Used In Industry to Defence - N Ellis.....	37
Somewhere Only We Know - D Collins	37
Enhanced Strategic AME: Deployable Aeromedical Transport and Retrieval System D.A.R.T.S - AP Pearce*, C Daniel	37
Should Eskimos Jump? Spondylolysis, Spondylolisthesis and the Military Parachutist - JE Cunningham*, E Hartley, AM Ellis	38
Review of ADF Injury Data for Infantry and Airfield Defence Guards: 1998-2003 - J Harvey.....	38
The Angels from Downunder, Reflections on the Third Medical Detachment in Balad - KJ Sullivan	39
RNZAF Aeromedical Evacuation ...The Challenge - JA Telford.....	39
What is the appropriate use of antidepressants in the Australian military? - JA Ross, L Lambeth*.....	40
Fantastic Voyage: Health Implications of Nanotechnology - RJ Stacy*, N Abou-seif	40
Combat Nursing in Afghanistan - D Dudley.....	40
Prioritising the blast injured patient: penetrating, blunt and burn injuries-what goes first? - JV Rosenfeld	41
ADF Rehabilitation Program - J Porteus*, A Gill.....	41
Environmental Health and Preventive Medicine Challenges from Kuwait to Baghdad, Feb to July 2003, Operation Iraqi Freedom - S Boos	42
Physiological penalties of prolonged hypotensive resuscitation - SA Watts*, J Garner, C Parry, J Bird, E Kirkman	42
Mental Health Support – An Enhancer of, or Detractor from Capability - L Lambeth.....	43
Why the recent events in Timor Leste were Predictable (and what it means for health) - KL Clifford	43
Workplace Assessment: Non-Ionising Radiation Hazard – Fleet Base West health Centre - N Westphalen.....	43

A Hero Before Gallipoli - MH Dowsett.....44

Combat and Military Mental Health Care: The Future - H Holloway.....44

Australian Military Hospital (Dili) – Operation Astute - JR Bessell*, W’ORegan, P Sharwood45

Oberon Class Submarine Occupational Hygiene Project – Creation of a Hazard Exposure Profile
- SM Bennett*, D Pisaniello.....45

Nicotine Addiction – A New Approach to an Old Problem - R Bittoun.....45

Health Services Evaluation - C Jenkins46

Escalation and Implementation of Commercial Healthcare Provision in an Operational Environment - G Keys.....46

Three-dimensional Scanning In Anthropometry – Bringing New Techniques and Applications to an Old Science
- ND Daniell*, T Olds, J Ross, S Morris, D Stratton.....47

The First Case-control Studies - Rum Ration Protects Against War Neurosis and Positive Family
History Predisposes - KWA Horsley*, EJ Wilson, G Hawthorne.....48

Business Management Issues - R Wilken.....48

Australian Military Aerospace Medicine; Science, Art and Reality - GV Hampson.....48

The Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP).
C D’Este*, J Attia, A Brown, P Schofield, R Gibberd, J Byles, M Tavener, R Gibson,
M Guest, K Horsley, W Harrex, J Ross49

The Ever Changing Challenges of Military Health Care Delivery in the 21st Century - T Austin49

The Electronic Medical Record from the Battlefield to the States: Leader Lessons from Iraq - E Granger50

“An Outsider Looking In” – E-Health in the US DoD - RF Curtis.....50

Challenges and Innovation of Technology-based Mobile Health Care Solutions in the Department of Defence
- T Morris*, R Clerici, K Chism, G Mogel.....51

Changing Times – Doing Things Differently - J Lumby51

Force Protection in Southern Afghanistan: The Challenges - DC Randell.....52

A Retrospective Study of the Nature, Circumstances and Burden of Acute and Repetitive Strain Injuries in the
Canadian Forces - BA Strauss*, JJ Whitehead, DC Menard, SG MacKenzie, MT Carew52

Immunisation for Defence Force Protection: Current Controversies - HL Kelsall*, JA Ross, MP Sim.....53

ADF Health Capability – Building a Sustainable Health Workforce of the Future
GM Whelan*, B Ford, B Pezutti54

Psychological and Mental Health Threats in Deployed Environments – An Issue for Force Protection - SE Hodson ..54

Impact of Systemic and Cultural Factors on Trade-related Injuries in the Australian Infantry
- WR Payne, JT Harvey*, EL Otago, DA Pascoe55

Japanese Encephalitis Vaccination – Limitations of the current vaccine (JE-VAX®) and the Australian Defence Force
involvement in the search for an improved vaccine. An overview of the Acambis ChimeriVax™-JE program.
- P Nasveld*, S Bennett, S Shakib, M Reid, J Stone, M Dobson, R Nichols, J Aaskov, S Yoksan, S Kitchener,
K McCarthy, T Monath, N Kanesa-thasan, J Marjason55

New Zealand Army Health Challenges - AC Dunn56

Facilitating air transport of military critical care patients – challenges and outcomes of the major AME
staging facility in Iraq - JK Lumsden.....56

Methodology for Profiling the Physical Demands of ADF Trades - DC Billing.....57

Common Exercise Related Injuries of the Lower Limb - AJ Delaney57

Effect of a 12-Week MEO Deployment on Nutritional/Immune Status and Physical Capabilities - C Booth58

Ethical Issues in Healthcare Whistleblowing - T Hoffman.....58

Privacy of Health Information in the ADF - JA Ross*, R Landy59

“More in the breach than the observance” A reflection, or more to the point, an interpretation of the
applicability of the Geneva Conventions in regard to health personnel during AMTG 2 - G Villani59

Risk Management in an Increasingly Litigious Environment - Implications for Defence - P Alexander.....60

Deployment, Research and Ethics, What is the relationship? - DL Harding.....60

Ethical Issues for Researchers in Defence Health - G Shirtley*, R Landy, J Morrison, G Cannell60

POSTER PRESENTATIONS

Dietetic Challenges in the Defence Force - D Moore.....62

Soft Tissue Injury Does Not Reduce the Effectiveness of Recombinant Activated Factor VII (rFVIIa) to Improve
Survival in Incompressible Haemorrhage - SA Watts, M Green, C Parry, G Lawton, N Martin, E Kirkman62

Optimising the Utility of Defence Injury Surveillance Systems - A McKinnon63

Military Load Carriage Research: Improving Soldier Performance and Minimizing Injury Risk
- RL Atwells*, MA Jaffrey, DC Billing, D Cramer63

Management of Low Back Pain - A J Delaney64

Do We Need Paediatricians in the ADF Health Service? Four Years Experience of Providing Medical Support
to the Australian Army Cadet Corps Annual Camp - GF Gill64

EDITORIAL

Scott Kitchener

This edition of the Journal includes the abstracts submitted and accepted for the 2006 Annual Conference of the Association combined with the 2006 Defence Health Symposium. Publishing the abstracts recognizes that valuable information which may be formally referenced in future is presented at this conference. It also provides a source of information for reference of those recalling relevant information for their practice of military medicine who may wish to then contact the presenter.

We hope that some of these abstracts will also develop into manuscripts submitted to this or other journals, however, it should be noted that while these abstracts may be referenced accordingly (Aust Mil Med 2006; edition: pages), publication of an abstract here does not preclude submission of a manuscript elsewhere for publication in a refereed journal.

I trust this will be a valuable resource of contemporary military medicine practice in the future, provide a foundation for further research and discussion and an encouragement to those considering presentation of aspects of their practice or research in the field. Thank you to those presenters who have contributed to the Conference and Symposium and to this edition of the Journal.

Scott Kitchener

CONFERENCE ABSTRACTS – PRESENTATION

The Emotional and Behavioural Challenges of Pandemic Situations

H Holloway

The pandemic spread of microbial and viral diseases in plant, animal and human populations over broad areas extending from continents to the entire planet have been recurring disasters in historic times. These events create demands that exceed available resources by a wide margin and present some of the most demanding disasters confronted by humans. The consequences of such pandemics have been significant death and suffering with resulting political disruption; continental populations have suddenly and significantly been reduced in size and stability; the organization of entire populations have been changed. The death and destruction associated with these events have killed significant portions of worldwide populations in modern times. (e.g. influenza in 1918-1919).

The agents responsible for pandemics tend to be new, and highly infectious in a susceptible population. In these populations, the disease causes serious illness and pathology. Quite justifiably, the bio-pathological consequences of such an infection tends to command the attention of those at risk, and those who are responsible for treating and preventing the consequences of the pandemic.

The emotional and behavioural consequences of pandemics are interpersonal loss and induced helplessness. These consequences result in wide spread social and psychological disruption produced both by the direct effects of the infection and by the measures instituted to prevent and treat the infection. This talk will review something of what we know about these emotional behavioural consequences. Treatment and management options will be presented. What is known about the efficacy of those options in preventing social and individual injury and disability will be examined. The problems likely to confront the population infected, or at risk of infection, will be examined from historical and other sources. The prevention and management of communal panic will be reviewed. Those responsible for the provision of services for those infected are at risk and their needs will receive attention.

The resources available to aid in planning and responding to the psychosocial demands created by a pandemic and its consequences will be identified. The analogous relationship between the biopsychosocial consequences of a pandemic, and the problems created by the threat of weapons of mass disruption that create wide spread trauma in populations, will be explored. Socio-cultural and psycho-biological dynamics will be discussed. The development of chronic post-traumatic psychiatric and somatic symptoms will be explored. The importance of approaching the population at risk as sources of collaborators and resources, that can be utilized to increase a sense of autonomy and efficacy, will be emphasized. Finally, the potential consequences of risk communication, the media and political leadership will be examined.

Prof. Holloway is presently at the F. Edward Hébert School of Medicine where he serves as Professor of Psychiatry and Professor of Neuroscience. Prof. Holloway is the author of more than 200 hundred articles, book chapters and major reports. He is Life Fellow of the American Psychiatric Association (APA) and has received the APA's Distinguished Psychiatrist Award. Prof. Holloway was awarded the honorary degree of Doctor of Military Medicine by USUHS in 1992. He has received the Legion of Merit and Defense Superior Service Medal. He has received NASA Medals for Leadership, Distinguished Public Service, and Distinguished Service.

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Operational Mental Health - The Challenge to Finding the Facts

G. Larkin

The psychological services provided to ADF personnel on operation have been developed and implemented on the understanding that operational deployments are a stressful experience. (see Health Bulletin No 11/2003 dated 13 Aug 2003). It is also understood that different operations will expose personnel to different stressors, with differing degrees of intensity. To that end, there is an assumption that a more "intense" operation will produce or cause greater negative psychological impact than a more "benign" operation. An example of this can be seen in the amount of public attention that the mental health of personnel servicing in Iraq is receiving (see The Sunday Age, Invisible enemy strikes Australian troops, dated 04 Jun 2006). However, to date there has been limited research to base such an assertion upon.

Consequently, in an attempt to explore and compare stressors across different operations and the reported impact of such stressors, data from the Return to Australia Psychological Screens was analysed. The analysis that was conducted primarily addressed the events reported on the Trauma Stress Exposure Scale – Revised (TSES-R). This questionnaire provides opportunity for the respondent to indicate the frequency to which they were exposed to an event (potential stressor), a rating of their reaction at the time of the event and a rating of affect at the time of completing the questionnaire. This research allowed for the more frequently reported and significant stressors, within each operation, to be identified and subsequent analysis of the reported impacts to be conducted. Hence, adding a scientific perspective to the current opinions and positions held in relation to the psychological nature of operations.

Captain Gae Larkin is employed in the Australian Regular Army as a Psychologist and is currently posted to the Health Psychology Research section of the Psychology Research and Technology Group.

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The Nursing Management of the Intoxicated Patient: A Rural Perspective

SC Mangion

Cowra is a rural town within in the Greater Western Area health Service of central NSW, with a population of 9,500 people. Cowra District Hospital has 34 acute beds. Medical cover is provided 24(hours)/7 via an on call -system utilising the local general practioners. This requires that the doctor be on call after- hours for all presentations to the emergency department. Each Medical Officer has a heavy client ratio with few available appointments resulting in many people being turned away, and consequently arriving in ED for medical advice/treatment.

How does nursing staff deal with these after hour's emergencies when there is no medical officer on duty on the health service site? Taking into consideration these other less urgent case presentations when the medical centres have no appointments available.

This case study looks at a presentation of an unconscious female 16 years of age, having consumed too much alcohol at *The Cowra picnic races*. This is an annual event that attracts around 5000 mostly young people who consider it the premier event to dress up and consume excessive amounts of alcohol.

This patient arrives at ED by ambulance at 0115 by ambulance, and this is the first of several presentations complicated by the heavy consumption of alcohol.

What is the nursing staff's responsibility and actions? How and why are these different from that of the medical officer on- call. What was initiated & what should have been the appropriate clinical management?

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“I'm an Australian, Get me out of here.” Health Support to the Lebanon Evacuation

T Smart, D Mitchell

The 2006 military conflict between Hezbollah paramilitary forces in Lebanon and Israel commenced on 12 July 2006 and ended when a United Nations-brokered ceasefire went into effect on 14 August 2006. The evacuation of civilians from Lebanon during this war represented one of the largest of its kind in history. Over 80,000 foreign nationals were evacuated from the country and nearly a million Lebanese people were displaced.

It is estimated that approximately 25,000 Australian citizens were in Lebanon at the beginning of hostilities and of these, over 5300 were evacuated by land or sea by the Australian government. The ADF deployed personnel to Beirut, Cyprus and Turkey to assist with the whole of

government response and all health support to the operation was provided by ADF health elements. Health support was provided at the following stages of the evacuation:

1. collection of Australian Nationals from southern Lebanon;
2. a three stage evacuation handling process in Beirut;
3. a six to 11 hour boat trip to Mersin in Turkey or Lanarca in Cyprus;
4. reception of patients at a second EHC in one of these two locations;
5. the several day holding period in hotels in Turkey or Cyprus; and
6. onward transport to an air hub.

The civilian population requiring evacuation in these extreme circumstances included many personnel with significant medical conditions, be they chronic problems (which had been under-treated due to the conflict) or injuries as a direct result of the conflict. Many of these personnel would not normally be fit to undertake travel of the nature required. In addition, the evacuation process was lengthy and involved several stages, all of which potentially required health support. The high incidence of motion sickness, particularly on the boats to Mersin, was a particular problem of this operation.

The overall level of health support provided to the operation was less than ideal. This meant that health personnel worked excessive hours in the initial evacuation phase and resources were extremely stretched. Of particular concern was the lack of medical escorts on most boats to Cyprus. If a major medical emergency had occurred on one of these several hour trips and health support was found to be absent, it would have reflected extremely poorly on the Australian government.

This operation further emphasised the need for good health planning, even in a mission that was not health focussed. A robust health capability is required at each end of the sea, air or land bridge in evacuation operations, with additional health personnel providing medical escort duty on all forms of transport. Commanders need to be made aware that health support in such a situation is not deployed only in support of their troops but may often directly contribute to the overall success of the mission in its own right.

Dr. Tracy Smart entered the Royal Australian Air Force (RAAF) in 1985 as an undergraduate, and graduated from Flinders University in 1987. She has served as a medical officer at RAAF bases around Australia, has completed overseas postings with both the Royal Air Force and the United States Air Force, and has been deployed to Rwanda, Malaysia, East Timor and the Middle East. She completed the UK Diploma in Aviation Medicine in 1992. Dr. Smart has served as Chief Instructor and twice as Commanding Officer of the RAAF Institute of Aviation Medicine. In August 2005 she was promoted to GPCAPT and posted to her current position as Officer Commanding Health Services Wing.

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‘Naturally-functional foods’: Roles for Molecular Composition and Food Architecture

M Gidley

Although all foods have a range of ‘functions’, the term ‘functional foods’ has come to be associated with those foods that contain specific ingredients with physiological effects. These can be particularly useful in providing fortified common foods such as cereals, bread, dairy products and margarine, both to combat potential vitamin and mineral deficiencies and to help in management of e.g. cholesterol levels, blood pressure etc. This molecule-based approach is also followed by the supplement industry and performance based foods such as ‘energy’ drinks. Molecular simplicity brings with it the benefit of clarity of communication when specific molecules can be linked to useful outcomes. For short term effects, the molecular approach to functional foods has clear analogies with medicine, and hence has been embraced by consumers seeking specific outcomes.

On the other hand, it is also well established from epidemiology and other observational studies that diets rich in complex ‘naturally-functional foods’ such as vegetables, fruits, grains, fish, lean meat, dairy/soy and certain oils are associated with sustained long-term health benefits. A benefit of this whole food approach is that there is a heritage of successful use in diverse communities around the world. In some cases, there are clear connections between the whole food approach and the specific molecule approach e.g. in oil quantity/quality or complex vs simple carbohydrates. However, in many cases it is difficult to be precise about the molecular origins for whole food benefits, as intervention studies with specific molecules have not shown convincing effects e.g. vitamin/mineral supplement intervention consistently fails to deliver the effects that might be expected from epidemiological data on source foods.

Taking fruits and vegetables as a case in point, it could be argued that the failure to reproduce ‘expected’ benefits via intervention with vitamins/minerals is due to some combination of (a) underestimation of the role of as yet unrecognized health-benefiting molecules and/or (b) the importance of the native cellular structure of plants in providing the matrix from which molecules are released during digestive processing. The science is now in place to tackle these possible causes, utilising post-genomic biology of food raw materials to better define molecular composition (“metabolomics”), and exploiting modern spectroscopic and microscopic methods to define the effect of food structure on molecular release.

Professor Mike Gidley is Director of the Centre for Nutrition and Food Sciences at the University of Queensland, based in Brisbane. The Centre is a virtual one and is linked with the Queensland Department of Primary Industries and Fisheries for whom Prof Gidley acts as Research Mentor. The Centre has the aim of promoting nutrition and food sciences across the two organisations.

Professor Gidley was trained in chemistry at the

Universities of London (BSc) and Cambridge (PhD), and worked on food-related research for more than twenty years in Unilever’s R+D laboratory at Colworth House in the UK, before moving to Brisbane late in 2003. Research topics have included starch and other polysaccharides, cell walls and tissue material properties in plants, and application of NMR spectroscopy in food science. This has resulted in more than 100 refereed publications and 16 patent applications.

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Determining Optimal Operational Duration from a Mental Health Perspective

JR Swann

There is currently little research available examining whether the mental health of ADF personnel returning from overseas deployment is effected by either the length of that deployment or the number of previous deployments. This paper addresses this relationship with the aim of providing preliminary guidelines for optimum deployment length from a mental health perspective. The Defence Psychology Organisation (DFPO) routinely administers the Return to Australian Psychological Screen (RtAPS) questionnaire to all ADF personnel returning from deployment. Data from these questionnaires were examined to address the current research question, drawing from multiple operations. Potential predictors derived from RtAPS questionnaire data include the length of deployment, number of previous deployments and minimum time between deployments. These variables were examined for their effect on a number of mental health indicators, including the K10, TSES-R, PCL-C, major stressors and morale. This research also examined whether relationship status, number of dependents and the operational nature of the deployment moderate for the relationship between time away from home and mental health indicators. The implications of these results for current Defence deployment guidelines will be discussed

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Health Intelligence Challenges in the Australian Defence Force

T Warwarek

The provision of ADF health intelligence (HI) is an essential function aimed at mitigating preventable injury and illness for deployed ADF personnel. Short notice deployments in support of natural and terrorist related disasters are becoming more frequent among ADF Operations. However, each Operation presents challenges for the development of Health Support Plans which are dependent on timely HI input.

Traditionally, HI has been provided by staff in offices at

the strategic and operational levels in Canberra and Sydney respectively. In accordance with the Bungendore plan and to optimise efficiencies in the provision of HI support, from January 2007, HI production will be conducted out of a single office. This office will come under the Defence Intelligence Organisation.

This paper will describe changes to the ADF HI capability, and the challenges for staff in providing HI support to ADF Operations.

WGCDR Trish Warwarek manages the strategic health intelligence office in Canberra. She is a RAAF Nursing Officer of 19 years who has attained a Masters in Nursing and a Masters in Defence Studies. She undertook two years training in the Armed Forces Medical Intelligence Centre in the USA to prepare her for her current role.

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The Recently-Devised Australian and New Zealand Nutrient Reference Values (NRV) and the Possible Development of ADF-Specific NRV

C Forbes-Ewan*, K Baghurst

In assessing the nutritional quality of dietary intake, nutritionists use reference nutrient intake standards. These standards have recently been reviewed jointly by Australia and New Zealand under the auspices of the National Health and Medical Research Council (NHMRC). The new standards are called the Nutrient Reference Values (NRV), and for the first time contain recommendations for chronic disease prevention as well as prevention of deficiency states. As far as allowed by current nutrition knowledge, three sets of values have been established for each nutrient—an Estimated Average Requirement; a Recommended Dietary Intake (RDI), the value that is believed to be adequate to cover the needs of most people within a particular age/gender group; and an Upper Level, the level above which adverse effects may be experienced. Where nutrition knowledge is insufficient to set an RDI, an Adequate Intake has been estimated. The chronic disease recommendations include Acceptable Macronutrient Distribution Ranges, which identify the ranges of intake that are consistent with good health in terms of percentages of energy derived from fat, protein and carbohydrate; and Suggested Dietary Targets for nutrients such as selected antioxidants, folate, dietary fibre and long-chain omega-3, generally set at the 90th percentile of population intake.

In addition to allowing assessment of nutritional quality of diets, NRV can assist in the development of scales of food entitlement for groups of generally healthy people living in an institutional setting. The Australian Defence Force (ADF) is one such group. However, the ADF is unlike any other population group in that there is a huge diversity of nutritional requirements between units, and across training and operational situations. The nutritional requirements of many ADF members—e.g. those with relatively sedentary or only moderately physically active occupations—are addressed by the NHMRC NRV. However, troops who are engaged in

special operations or conventional operations in extreme environments may have requirements beyond those of any other population group. Studies conducted to determine the energy costs of a wide range of ADF occupations have suggested that it may be appropriate to define five categories of physical activity. These map approximately, but not precisely to the six categories of physical activity recognised by the NHMRC based on physical activity level. In particular, the ADF categories of energy expenditure depart from those of the NHMRC at the higher levels, and some training/operational situations are not addressed by the existing NHMRC values. Consequently, Defence Nutrition is investigating the possible development of specific ADF Nutrient Reference Values (ADF NRV) with the NHMRC.

The presentation will describe, inter alia, the development of the NHMRC NRV, the studies in support of the conclusion that the ADF has specific nutritional requirements not addressed by the NHMRC NRV, and progress towards the development of ADF NRV.

Chris Forbes-Ewan has 20 years experience in Defence nutrition research. His research interests include determination of nutritional requirements, food intake and food acceptability; hydration status; physical performance enhancement using nutritional ergogenic aids; and the effects of military rationing on health and physical performance. For ten years he was Australian National Leader of an international defence technical panel that investigated the value of purported aids to military physical and cognitive performance. In 2006 he was appointed Assistant Site Manager at DSTO-Scottsdale (Defence Nutrition).

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The Australian Defence Force Response to the 08 Oct 05 Asian Earthquake

KL Leshinskas*, A Dines

Following the devastating 08 Oct 06 Asian earthquake, Australia responded very early with financial aid. A few weeks down track the Australian government decided that due to the scale of the earthquake, that additional assistance, particularly medical assistance was required. The Australian Defence Force was well placed to provide this assistance.

A reconnaissance team was put together and went to Pakistan to decide to how best to further assist the devastated region. On arrival the Pakistan Federal Relief Commission Representative suggested that Australia could assist with primary health care support in the village of Dhanni, 20 kilometres from the earthquake epicentre.

Four Australian Defence Force primary health care teams commenced work in Pakistan in mid November. Over the next 3 months the teams saw 9500 patients and administered 4500 immunisations to the civilian population in the Dhanni area, resulting in a lasting difference to the health of the community. The efforts of the teams included involvement in the Pakistan Expanded Program of Immunisation, Aeromedical evacuation and outreach programs to more remote villages. At the end of February the ADF health facility was handed over to the Government of Pakistan.

The experience was personally and professionally rewarding for all involved and has confirmed that Primary and Preventive Health care is an excellent option for humanitarian Assistance in Disasters.

Wing Commander Karen Leshinskas currently works at Headquarters Health Services Wing at Amberley.

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Transitioning from Civilian to Military Life: Building Resilience in Army and Royal Australian Navy Recruits

J Watkins, M Goodman*

The Army Recruit Training Centre, Kapooka and the Royal Australian Navy (RAN) Recruit School, HMAS Cerberus have identified that the highest number of recruit discharges, from each service, for psychological reasons occur in the first three weeks of training. In July 2006 Resilience Training was introduced to all Army and Navy recruits as part of an ongoing trial aimed at improving the ability of recruits to cope with the transition from civilian to military life and to reduce the number of ARA and RAN recruits who discharge on psychological grounds. The training is based on research conducted by LTCOL Andrew Cohn. His study examined the effectiveness of a two session CBT program designed to promote realistic attributions for problems experienced by ARA recruits during recruit training and to then match these attributions with adaptive coping strategies. The training involves approximately four hours of lectures and workshops delivered by Defence Psychologists. The training has been adapted to reflect the unique culture of each service. Early indications are that the training is having a positive effect in reducing discharge rates but more detailed evaluation over time is required.

MAJ Margaret Goodman is the Senior Psychologist, Psychology Support Section-Kapooka

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Treating Nicotine Dependence: The Nurse's Role

D Harrison

Nurses have a pivotal role in the scientifically based assessment, treatment and management of nicotine dependence. Tobacco smoking is a behaviour which accounts for the single largest preventable mortality and morbidity rates in Australia. Traditionally, attempts at facilitating smoking cessation have been behaviourally based. As all behaviour is brain driven, it seems logical to address the underlying pathophysiology in the brain eliciting smoking behaviour. Nicotine dependence is classified as a disease by the US Surgeon General. There are evidence based pharmacotherapies which are highly efficacious in the treatment of nicotine dependence. Sadly, many smokers have been expected to "self treat" in terms of the type and dosage of pharmacotherapies.

This results in very high relapse rates and a perception of "failure" by the smoker. Re-attempts at quitting may take up to 2 years due to 'shame' and smokers may lie about their current smoking status. Smokers are not a homogeneous group in terms of degree of nicotine dependence. It is therefore vital that there is a shift from the "generic" treatment of nicotine dependence to an individualised tailored one.

This paper will address the role that nurses have in ensuring that smokers have access to a treatment programme for nicotine dependence which is evidence based to maximise the chance of permanent abstinence from a highly dependence producing drug which is typically very difficult to treat.

Donna has worked as a Smoking Cessation Clinician for the past 18 years assessing, treating and managing patients with nicotine dependence. During the 1980's and 1990's,

she was heavily involved in tobacco smoking prevention activities with The NSW Quit For Life Campaign. Her role has included teaching other health professionals into the treatment and management of nicotine dependence and consultancy work with regard to smoking cessation in the work place. She has participated in research into new treatments in smoking cessation and has played important advocacy roles in Smokers' rights to treatment of nicotine dependence.

She is a founding member and Vice President of the Australian Association of Smoking Cessation Professional.

Dietary Intake And Health Implications For Navy Personnel

RA Coad*, PJ Probert

DSTO has recently completed its second fatigue and nutrition study with Navy. The aim of these studies was to quantify fatigue, and nutritional and health status of ships' crews. This presentation focuses on the nutritional and health aspects of those studies.

The dietary intake of a group of RAN officers and sailors has been assessed using food frequency questionnaires and individual interviews. Dietary intakes ashore and at sea are compared and are assessed against the National Health and Medical Research Council's recently developed Nutrient Reference Values. The health implications of the diets are considered, in particular coronary heart disease (CHD) risk. The incidence of certain other CHD risk factors, including weight status, blood pressure and smoking, has been determined for the study group. Weight status was assessed using body mass index and skin fold anthropometry measurements.

A range of factors influence food choices of naval personnel, and the significance of some of these factors may be quite different at sea compared to ashore. As a consequence the intake of certain food groups may be affected. In this study the intake of dairy products, fruit and cereals was found to be lower at sea with potentially negative health outcomes.

In Australia, the prevalence of overweight and obesity has increased significantly over recent decades. The proportion of overweight individuals in this study was slightly lower than the national average, however it is important to remember that

Australia ranks among the top ten fattest nations on the planet (OECD data).

Ross Coad has been employed at DSTO-Scottsdale since 1988, working in the fields of chemistry, microbiology, food technology and nutrition. He has a Masters of Business Administration – Technology Management (Latrobe University), Bachelor of Applied Science (University of Tasmania) in Chemistry and Geography and an Associate Diploma in Laboratory Technology (Riverina-Murray Institute of Higher Education). He is a Member of the Royal Australian Chemical Institute and a Member of the Nutrition Society of Australia. Ross is currently a Task Manager conducting research into fatigue and nutrition on Navy vessels.

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Operation Pakistan Assist – Lessons Learned for Future Provision of Humanitarian Aid by the ADF

P McGinty, TC Jongeneel, SJ Barry*, SM Sawyer, P Lonergan

The world has seen a significant prevalence of large-scale natural disasters in recent years. Natural disasters cause not only death and injury but also massive disruption to the normal functions and infrastructure of communities. In most cases the greater population is displaced with little or no housing, food, clean water or access to health care. The duration of a disaster event will vary with the speed of reconstruction and re-establishment of the basic functions of a community. This would include rebuilding of physical infrastructure, supply and distribution functions, health care delivery and re-establishment of normal economic functions.

Armed conflict produces exactly the same effect as a natural disaster agent however ADF Health assets are often deployed with a limited mandate, that is, supporting the deployed force, often finding the provision of Humanitarian Aid (HA) a function of “mission creep”. **One then questions should HA be a mandated core task of ADF health?** The provision of HA provides a unique set of challenges to an organisation that is largely structured, trained and equipped to provide combat related health support and primary health care to ADF personnel.

On 8th October 2005 an earthquake struck high in the Neelum Valley (Azad Kashmir). This earthquake destroyed many of the basic living conditions including all existing health infrastructure. In November 2005 a small ADF contingent comprising of four Primary Health Care Teams deployed as part of OP PAKISTAN ASSIST to provide basic health care to this population of approximately 30,000 people. The initial period of the deployment saw the teams treating a significant number of injuries and conditions directly related to the earthquake. As the deployment progressed however, its focus became one of replacement / sustainment of basic health care in the absence of any local infrastructure.

Many lessons can be drawn from the OP PAKISTAN ASSIST experience. Presenters will discuss ADF delivery of HA in the current global environment drawing on personal

experience and review of literature. Key focal points of discussion will include:

- The placement of HA as a core function of ADF health.
- Current training gap of ADF Nurses for the provision of health care to local populations including key areas of obstetrics/midwifery, paediatrics and age related health care.
- Equipment and pharmaceutical issues of HA provision. and
- ADF HA response preparedness.

LT Simon Barry is a Nursing Officer from the 2nd Health Support Battalion. In 1994 he graduated from the Australian Defence Force Academy and Royal Military College Duntroon and served as a General Service Officer in the Royal Australian Army Medical Corps. In 2000 he transferred to the Reserve and completed a Bachelor of Nursing re-enlisting back into the Regular Army as a Nursing Officer in 2003. LT Barry will introduce his fellow speakers.

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Screening for Psychological Changes Throughout A Military Deployment: Australian Defence Force Personnel In The 2003 Gulf War

N Bennett, N Sadler*

It has been widely recognised that military service places personnel at risk of developing mental health conditions and the ADF had taken an active approach to provide early intervention and treatment to serving personnel wherever possible. Research suggests that early intervention following combat or disaster situations is likely to assist an individual recover, and whilst the success of such intervention in preventing chronic problems in the long-term is still relatively unknown, studies indicate that principles of early intervention can greatly assist individuals experiencing stress reactions. This presentation examines the psychological support provided to ADF personnel involved in Operation Sumatra Assist following the Boxing Day tsunami in 2004, and considers the effectiveness and applicability of such interventions for future military operations.

MAJ Nicole Sadler joined the Australian Army Psychology Corps in 1994 and has worked in various recruiting, counselling and policy development positions. She is currently the Student Counsellor at the Royal Military College - Duntroon. Major Sadler's operational experience includes short deployments of Bougainville, and more recently to Malaysia during Operation Sumatra Assist. She was awarded her Master of Psychology (Clinical) degree through Charles Sturt University in 2005.

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What is the Effectiveness of Lung Assist Devices in Blast Lung Injury: A Literature Review

BR Mackie

The following presentation, *What is the effectiveness of lung assist devices in blast lung injury: A literature review* is highly relevant to critical care nursing where the current patterns in worldwide terrorist activity have increased the potential for casualties related to explosions. Moreover, should a terrorist event that involves an explosive device occur in Australia, few institutions have experience in managing blast-injured patients.

Blast lung injury (BLI) presents a unique triage, diagnostic and management challenge for health professionals working in critical care. BLI is a condition that is seen most frequently in a combat or military environment, however, urban terrorist activities such as the recent Bali, Madrid and London train bombings, plus industrial and domestic explosions can occur at any moment in the civilian setting. BLI is a direct consequence of a blast wave from high explosive detonations upon the body. The physics of blast waves is nonlinear and complex.

The aim of this study is to identify through an extensive literature review: (1) what is the effectiveness of lung assist devices in blast lung injury, (2) what are the recommended treatment modalities for BLI, and (3) that medical and nursing staff within the Australian critical care setting become familiar with the management of BLI.

Nursing literature on lung assist devices and treatment modalities for BLI in the critical care setting from January 1995 until March 2006 was reviewed using the CINAHL, MEDLINE, Cochrane Library, Blackwell Synergy, and ProQuest databases. Key words utilized were: blast lung injury, acute lung injury, blast lung, barotrauma, lung assist devices, trauma management, treatment modalities, acute respiratory distress syndrome and extracorporeal membrane oxygenation. Combinations of these words were also used (e.g. lung assist devices – blast lung, acute respiratory distress syndrome – lung assist device, extracorporeal membrane oxygenation – blast lung, treatment modalities – blast lung). The lack of research conducted in this area was demonstrated by the fact that the review produced no articles reporting the use of lung assist devices in blast injured patients. Consequently, the review process was broadened to incorporate all research conducted on subjects with injuries that would reflect a blast lung type injury (e.g. ALI, ARDS, and barotrauma). This broadening of the review process identified only four relevant articles reporting the use of LAD for ALI/ARDS in clinical trials and two retrospective case studies of BLI patients.

The innovative practices and new technologies outlined in this literature review are promising and indicate a direction of clinical application not previous seen.

Benjamin Mackie, is a regular army nursing officer posted to the 2nd Health Support Battalion in Brisbane. As an intensive care nurse, Ben has served operationally in the Solomon Islands, Iraq, and has just recently returned from

Timor Leste where he was the officer in command of the intensive care unit at the Australian Military Hospital -Dili. He is currently completing his Masters in Nursing at the Queensland University of Technology and has a keen interest in the area of acute lung injury.

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Nutritional Requirements of Soldiers Engaged in Infantry Initial Employment Training

C Forbes-Ewan

The Army's School of Infantry (SoI) provides infantry initial employment training (IET) to soldiers who have completed recruit training and have been directed to Infantry Corps. There is a high attrition rate associated with infantry IET. For example, of 45 members of a platoon observed by the principal researcher shortly before this study, only 19 completed the course in the minimum possible time. Injuries were the most common reason for delayed completion. Revised procedures—including the introduction of two 'refit' weeks and the use of some safety equipment (e.g. knee and elbow pads)—were instigated in an attempt to reduce the rate of injury.

This study aimed to determine the potential for nutritional intervention to enhance performance and further reduce injury risk. In particular, the study aimed to determine whether or not the food currently available to soldiers engaged in infantry IET is adequate to meet the energy demands of training, and whether or not nutrient intakes—particularly intake of carbohydrate—are in accordance with recommendations for very active people, such as endurance athletes and soldiers engaged in arduous physical training.

A secondary aim of the study was to determine the effectiveness of Army's current rationing entitlements (as prescribed in SUPMAN 4: *Australian Defence Force Ration Scales and Scales of Issue, Edition 6*) to meet the demonstrated nutritional requirements of soldiers undergoing infantry IET.

Three visits were made to SoI: at the start, mid-point and for the final week of the 11-week course. Volunteers from one platoon provided informed consent to take part in the study. Variables determined at each visit included weighed food intake at the mess, body weight, circumferences (mid-upper-arm, waist and hip), body fat (by skinfold measurement) and energy expenditure (by the 'factorial' method, which uses a detailed record of activities to estimate total daily energy expenditure). Height was measured once, and a two-day food diary was completed by participants during the weekend preceding the commencement of the course, to gain some appreciation of their habitual dietary intake away from the mess. 'Focus group' sessions were also undertaken to determine participants' subjective opinions of the suitability of rationing at the SoI. Results of physical fitness testing were also obtained, to investigate if physical fitness is related to quality of diet. Because of the small number of participants (initial n=43), it was anticipated that statistical significance was unlikely to be achieved for this relationship; at best, only a trend could be expected.

At the time of writing this abstract, field aspects of the study have been completed. Results, conclusions, and recommendations will be presented at the AMMA meeting.

Chris Forbes-Ewan has 20 years experience in Defence nutrition research. His research interests include determination of nutritional requirements, food intake and food acceptability; hydration status; physical performance enhancement using nutritional ergogenic aids; and the effects of military rationing on health and physical performance. For ten years he was Australian National Leader of an international defence technical panel that investigated the value of purported aids to military physical and cognitive performance. In 2006 he was appointed Assistant Site Manager at DSTO-Scottsdale (Defence Nutrition).

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Environmental Health Challenges Faced During Operation Pakistan Assist Nov 05 – Apr 06

TRG Strickland

On the 8th October 2005 an earthquake with a magnitude of 7.6 on the Richter Scale struck the provinces of Azad Jammu Kashmir (AJK) and North West Frontier (NWF). Initial casualty estimates were 73,000 dead, 70,000 injured and up to 3.5 million left homeless. As part of Australia's whole of government (WOG) response, the Australian Defence Force (ADF) established OPERATION PAKISTAN ASSIST and committed four primary health care teams, four Blackhawk helicopters and over 140 personnel in early November 2005, to provide humanitarian aid in support the international relief efforts. In the end the ADF's contribution over a five month period included the provision of over 9 500 medical treatments, in excess of 4 000 immunisations, 74 aeromedical evacuations and the delivery of thousands of tonnes of aid (food, shelter, clothing).

An Air Force Environmental Health Officer (ENVHO) was part of the initial reconnaissance party and subsequently stayed for the duration of the Operation. An Army SNCO Preventive Medicine Technician was included as part of the main body. Environmental Health (EH) support was two faceted, supporting both the humanitarian health assistance to earth quake affected population and sustaining the ADF camps and personnel. The purpose of this presentation is to focus on the challenges faced in providing the EH service, especially for the ADF camp and personnel. This included equipment, locality (remoteness) and environmental factors which required innovative adaptations of principles and practices in doctrine and policy. The use and adaptation of field hygiene equipment and methods is examined and their role in providing fundamental but effective hygiene and sanitation conditions is showcased.

SQNLDR Strickland is an Environmental Health Officer currently serving in the Royal Australian Air Force. He has served on a variety of deployments including service in East timor, the Middle East and most recently to Pakistan as part of the ADF's Operation Pakistan Assist

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Psychological Support To Deployed Forces: A Review Of Intervention During Operation Sumatra Assist

N Bennett, NJ Sadler*

It has been widely recognised that military service places personnel at risk of developing mental health conditions and the ADF had taken an active approach to provide early intervention and treatment to serving personnel wherever possible. Research suggests that early intervention following combat or disaster situations is likely to assist an individual recover, and whilst the success of such intervention in preventing chronic problems in the long-term is still relatively unknown, studies indicate that principles of early intervention can greatly assist individuals experiencing stress reactions. This presentation examines the psychological support provided to ADF personnel involved in Operation Sumatra Assist following the Boxing Day tsunami in 2004, and considers the effectiveness and applicability of such interventions for future military operations.

MAJ Nicole Sadler joined the Australian Army Psychology Corps in 1994 and has worked in various recruiting, counselling and policy development positions. She is currently the Student Counsellor at the Royal Military College - Duntroon. Major Sadler's operational experience includes short deployments of Bougainville, and more recently to Malaysia during Operation Sumatra Assist. She was awarded her Master of Psychology (Clinical) degree through Charles Sturt University in 2005.

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Nursing – The Invisible Profession

B Wright

As a practicing registered nurse of many years experience I have witnessed many changes to my profession and the health care industry. Such changes have been the result of increasing technologies, higher educational requirements, increasing global shortages of registered nurses and other health care personal. Much has been written about impact on the civilian sector however, the Defence Force is not immune from these changes and there now exists opportunities for Defence to be innovative in the way that health care can be delivered.

This paper will briefly examine the current situation of nursing in the ADF, the traditional silence of voice of the nursing profession and the opportunity for nursing to offer alternatives to the changing health scene.

COL Beverley Wright commenced her military life as an Army Reserve Officer in 1975 in Queensland. She was appointed to the Australian Regular Army, (ARA) in 1990. In early 1993 she was part of a health team who took a number of WW2 nurses back to Banka Island where they had been incarcerated during the war. Later that same year COL Wright was posted to Fort Sam Houston 1993-1994 as an International Student where she undertook a number of

courses. In August 1994 she was posted to Rwanda as part of the United Nations Mission Assistance to Rwanda (UNAMIR 11). COL Wright is a Registered Nurse, Registered Midwife, Maternal and Child Health Nurse. She has a Diploma of Applied Science (Nursing and Unit Management), Bachelor of Arts Degree (Sociology), and a Master of Social Planning and Development. She is a Fellow of the Royal College of Nursing Australia and an Associate Fellow of the Australian College of Health Service Executives. COL Wright was appointed as the Staff Officer Grade One Strategic Health Planner (SO1 SHP) in Defence Health Services Branch. Whilst in this role COL Wright conducted strategic health planning for Australian Defence Force (ADF) operations by liaising with, and provision of, health advice to Strategic Command Division on operational issues. COL Wright was promoted in 2003 and assumed the position of Director of Defence Force Nursing and Strategic Health Plans and Operations. As the Director of Defence Force Nursing COL Wright is responsible for the technical control of ADF nursing. She also holds membership on the National Nursing Organization and is a member of a number of professional nursing bodies.

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Complex Carbohydrates and Gut Health

D Topping

Gut health is a term that encompasses the promotion of the normal function of the gastrointestinal tract and the prevention of serious diseases in the long term. The large bowel is a focus of much of the research as it is becoming recognised as an important contributor to the digestive process as well as a site of serious disease. Constipation is a major problem in developed countries while infectious diarrhoeal diseases are a significant cause of infant death in developing ones. Inflammatory bowel disease (IBD) is a manifest problem in Australia and similar countries and is emerging in countries such as India and China with affluence. Irritable bowel syndrome (IBS) is a non-fatal condition which causes significant discomfort to a large fraction of the population. Large bowel cancer accounts for >4,300 deaths per annum in Australia alone. Complex carbohydrates have a significant role to play in gut health. Non-starch polysaccharides (NSP, major components of dietary fibre) are non-digestible to human small intestinal enzymes and are good faecal bulking agents. High fibre foods are a proven means of controlling constipation and increased fibre consumption is thought to protect against colorectal cancer. While the importance of fibre is recognised, starches which digested less efficiently by human small intestinal enzymes may be even more important. Slowing digestion gives a lower glycaemic index (GI) and reduced demand for insulin and is of benefit in controlling diabetes. Limiting small intestinal starch digestion so that a fraction escapes into the large bowel is also of benefit. This undigested starch (resistant starch, RS) is metabolised by the large bowel bacteria, releasing short chain fatty acids (SCFA). SCFA are absorbed and contribute to energy but they also have a number of effects which promote colonic function. One benefit of RS is in managing the fluid loss which occurs in infectious diarrhoea. CSIRO has collaborated with DSTO in analysing

combat ration packs and shown that they are largely low in NSP and RS which may explain the reported loss of capability through this problem during deployment. CSIRO is developing a range of high RS/low GI products through large multidisciplinary research projects in two National Research Flagships. These may find defence application and include new wheat and rice cultivars. One product with the potential to improve capability is a chemically modified starch which delivers SCFA to the large bowel and so could lower the risk of diarrhea

Dr Topping obtained his PhD from University of London for studies on insulin action and lipid metabolism. He has worked on various health-related subjects including smoking and health, the metabolism of n-3 fatty acids and on obesity. He joined CSIRO in 1977 and is currently employed in the National Research Flagships Program where he is co-ordinating gut health research between p-Health and Food Futures Flagships.

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Prevalence Of Obstructive Sleep Apnoea In The ADF – Preliminary Study: Use Of a Questionnaire to Screen Individuals at Risk of Moderate to Severe Obstructive Sleep Apnoea

Dr M Lakos

Obstructive Sleep Apnoea (OSA) is the periodic reduction (hypopnoea) or cessation (apnoea) of breathing due to narrowing or occlusion of the upper airway during sleep.

OSA affects up to 5% of the population and can affect people of any age, from newborn babies to adults of either sex.

It is a common but underrecognised disorder with associated substantial morbidity and mortality. The main symptom is excessive daytime sleepiness, but affected individuals can also suffer from morning headaches, irritability, depression,

sexual dysfunction and memory lapses. This can lead to poor work performance and increases the risk of an individual having an automobile accident.

OSA has also been linked to premature death, hypertension, metabolic syndrome, ischaemic heart disease, stroke, and depression.

One of the simplest ways to screen for individuals, who are at risk of suffering moderate to severe OSA, is by the use of a sleep questionnaire. At risk individuals are defined by the use of a scoring system. These individuals then have the diagnosis of OSA confirmed by a Diagnostic Sleep Study.

Aim: To determine the number of defence individuals at risk for moderate to severe OSA in the Liverpool Military Area (LMA)

Method: An OSA questionnaire will be distributed to approximately 4000 defence members in the LMA health dependency. The returned questionnaires will be scored, and this data will be used to define an at risk group.

We will be presenting the results of the OSA questionnaire. In the second part of the study, at risk individuals will

undergo a diagnostic sleep study to ascertain the prevalence rate of OSA in the ADF.

Dr Lakos has worked for Defence Health for 2 years. He is currently the Director of Clinical Services at 1st Health Support Battalion, Holsworthy Barracks, Sydney.

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Psychological Screening after Operation Catalyst: Trends, Questions and Future Directions

A Kaine*, N Steele, S Hodson, A Twomey

Over the past two decades ADF personnel have participated in an increasing number of operational, peacekeeping and humanitarian missions in diverse locations, one of the most recent being, the deployment to Operational Catalyst in Iraq. During this deployment ADF personnel have been exposed to a range of significant operational stressors and potentially traumatic experiences. In response to these stressors the Australia Defence Force (ADF) has implemented a comprehensive screening program to allow early intervention for at risk individuals and to provide feedback to commanders on the psychological health of their force. This program is the Return to Australia Psychological Screening (RtAPS) and Post Operational Psychological Screening (POPS) process.

This paper will utilise trend data from Operation Catalyst to highlight the strengths and weakness of the current approach. The current process can provide an important overview of key personnel issues, record stressors experienced and monitor mental health indicators and results in the referral of potentially at risk individuals. However, there is currently little evidence to support predictive value of the process. To address this problem a proposed a longitudinal study validation study will be outlined. This has not been attempted to date in the ADF and therefore represents an important step in determining the effectiveness of this program.

CAPT Kaine is currently posted to the 1st Psychology Unit. She has had operational experience in East Timor, Pakistan and the Middle East. She is currently enrolled in a Phd through Adelade University.

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Leadership and Management Support for ADF Nursing Officers

E Tracy*, J Finucane*, T Carthew*

This paper will evaluate the pilot leadership and management support program for new Army nursing officers. This program is in no way designed to replace the current ADF leadership and management curriculum. It aims to support new nursing officers by providing a type of bridging program prior to their commencement of more formal leadership training. This paper will outline the course contents and provide an evaluation of the program.

The program focussed on the unique and challenging circumstances of the military health environment. Broadly stated the program outcomes were:

- Increased understanding of different leadership styles and the most effective in critical situations;
- Recognising the different personality types and their impact on the operational and tactical environment;
- Identifying the drivers for effective people performance; and
- Increased awareness of coaching and mentoring techniques with the creation and support of a mentoring program.

The delivery strategy was a blended learning approach which included senior officers, experienced reserve officers, nursing undergraduates and newly appointed junior officers. Senior officers acted as sponsors and syndicate directors who shared their leadership knowledge and operational experience. The method of delivery was a combination of facilitated conversation, self assessment tools, formal instruction and syndicate exercises. A selection of program topics included:

- Leadership styles, working with different personality types, motivating people to perform, conflict resolution, coaching and mentoring, team dynamics and planning, leading people through change and project management.

This paper will present level one - three evaluative data and will conduct interviews with participants four – six weeks after the course. The analysis of this data will focus on the building of a leadership and mentoring capability within the ADF nursing officer stream. Furthermore it will review any evidence of behavioural change in participants after the program. These findings will enable Service directors to determine if the continuation of this learning and development support program delivers an improved leadership capability and return on business investment.

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Obstructive Sleep Apnoea: A Referral Profile in Defence Personnel

MCF Pain*, H Teichtahl

Obstructive sleep apnoea (OSA) is a clinically significant condition producing sleepiness and poor performance with an incidence of about 2% in the general population. In severe forms it is associated with hypertension, stroke and respiratory failure and is often accompanied by obesity which in itself predisposes to OSA. Awareness of OSA as a clinical entity requiring treatment and of its potential to influence deployment has prompted an increasing number of referrals of ADF personnel with possible OSA. Since it is expected that the ADF is maintained at a high level of physical fitness, the reason for individual referrals has been examined.

Methods. The history and clinical findings in a cohort of 60 ADF members were examined before and after the performance of polysomnography. At the initial consultation the body mass index (BMI) and a score of daytime somnolence (ESS, Epworth sleepiness score) were determined.

The general probability of OSA being present was assessed as a 20%,40%,60% 80% likelihood. These findings were then related to the final recommendations made after polysomnography.

Results. The mean age of the cohort was 36.6 years (range 21-55). There were three females. The commonest presenting symptoms were snoring with witnessed periods of apnoea (21), snoring without somnolence (12) and snoring with daytime somnolence (14). Other presenting symptoms included headache, fatigue, post-operative events and trauma. Mean BMI was 29.3 kg/sq.m (range 22-36.5) and the mean ESS was 10.5 (range 2-17). Conservative measures were recommended in 21 instances, ENT consultation in 11 instances and active treatment (CPAP or mandibular advancement) in 14 instances. The pre-test likelihood score did not help in the detection of subjects treated conservatively or actively.

Discussion and Conclusions. Abnormal body weight was a major associated factor in this cohort so that weight loss programs are an important component of therapy. Significant OSA can occur in persons of normal weight and in this group other mechanical factors may require definitive treatment. Unfortunately, it does not appear that careful clinical assessment can predict the likelihood of significant OSA being present.

Michael Pain is a retired member of the RAAF Specialist Reserve and a former Consultant Physician to the Surgeon General. He retired as Director of Thoracic Medicine at the Royal Melbourne Hospital in 2001 and continues research interests in clinical respiratory physiology and limited private practice.

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The Acute Mental Health on Operation (AMHOO) Course

J Wardell*, D Clark

The Acute Mental Health on Operation (AMHOO) course was developed by the Directorate of Mental Health, in collaboration with the ACPMH. The aim of the course is to train medical, psychology and nursing officers, using a multidisciplinary approach, in the recognition, assessment, immediate treatment and short-term management of individuals who present with acute symptoms in-theatre. The most expedient and effective interventions are addressed on the course, within a framework of repatriating or returning to duty service personnel. While the course focuses on deployment considerations, it is suggested as suitable for anyone wishing to gain a greater understanding of the issues in managing acute mental health presentations. The presentation will outline the nature of the course, outcomes of the pilot and potential future applications.

SQNLDR John Wardell is member of the RAAF Specialist Reserve and is currently SO1 Psychiatry at the Directorate of Mental Health. In civilian life, he is Consultant Psychiatrist at the Veterans' Psychiatry Unit, Heidelberg Repatriation Hospital where he spends the majority of his time looking after veterans of conflicts as diverse as Iraq and Vietnam.

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The Challenges of Nursing in The Army INTERFET 1999 To OP ASTUTE 2006

D J Wade

This presentation will address the challenges of Nursing in the Australian Regular Army between INTERFET 1999 (East Timor) and OP ASTUTE 2006 (East Timor).

The presentation will describe predominantly my own experiences as a Perioperative Nursing Officer in the roles of an Officer in Charge (OIC) and Officer Commanding (OC) in the deployable environment.

The presentation will briefly outline where Royal Australian Army Nursing Corp (RAANC) Nursing Officers have deployed on operations between INTERFET 1999 and OP ASTUTE 2006 and their roles.

The presentation will discuss and examine the following:

- Nursing Officer role within Army and any changes between 1999 and 2006.
- The Nursing Officer role within the Sydney and South-East Queensland Area Health Services, and how in barracks health support and has changed between 1999 and 2006, and the impact on how Nursing Officers are employed.
- The changes to deployable health capabilities between 1999 and 2006.
- The overall effect these above two changes have had on how Nursing Officers are employed.
- What clinical and military training Nursing Officers currently undertake.
- The reality of Nursing in the Army today? Whether it is at the unit RAP, CSSB, HSB
- What are recruiting and retention issues currently faced by RAANC.
- The future role of Nursing Officer in the Army.

The future recruiting strategies, what initial military and ongoing training is required, how are the skills / competencies of a Nursing Officers maintained, and how to retain Nursing Officers?

MAJ Dominic Wade is a Perioperative Nursing Officer and Officer Commanding Clinical Company currently posted to the 2nd Health Support Battalion in Brisbane. MAJ Wade enlisted in the Army in 1994 and has been posted to Albury Wodonga Medical Centre, 1 HSB & 2 HSB. He has a post graduate certificate in Perioperative Nursing. His overseas deployments include the following: Combined Health Element OP BEL ISI (Bougainville) in 1999, UN Military Hospital East Timor in 2002, Health support Company OP ANODE Solomon Islands 2003 / 2004, OP SUMATRA ASSIST 1, Banda Aceh at the Anzac Field Hospital in 2005, and recently returned from a 3 month deployment on OP ASTUTE East Timor at the Australian Military Hospital Dili in September this year.

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Joint Health Planning and Operations in the Australian Defence Force – Theory vs Practice

AJI Dines

The theory of operational planning and the practical conduct of operations often seem poles apart. This paper gives an overview of the joint operational planning process and its application to health planning. It discusses the key principles that guide health planning and challenges that affect the application of the theory in the operational context. The planning and conduct of current ADF operations are used to illustrate the tension between the theory and practice of military operations in 2006.

Group Captain Amanda Dines has been a medical officer in the Royal Australian Air Force since 1988. She has had operational experience in Iraq and Timor Leste and is currently the Chief Staff Officer Health at the Australian Defence Force's Headquarters Joint Operations Command.

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Endemic and Epidemic Substance Abuse in the Military: What does the past tell us about the future

H Holloway

Non-alcoholic drug abuse in the US military in the 1960s and 1970s was on an epidemic scale. Since it first came to public attention during the period of involvement in Vietnam and its aftermath, this epidemic became associated with the Vietnam War. The epidemic was world wide and lasted until the last years of the 1970s. Eventually it was most intense in troops deployed in Europe and was associated with a B-hepatitis epidemic. The purpose of this paper is to put this world wide epidemic in to the context of substance use and misuse in the US military and to examine the lessons that can be learned by examining that narrative. The history of endemic and epidemic problems (e.g. alcohol abuse/ dependency, opiate abuse, stimulant abuse, barbiturate abuse/dependency, use of PCP, abuse of products containing THC) will be reviewed. Risk factors extending from the demographics of military personnel, the organization of military units, drug use policies, and cultural/religious beliefs will be discussed. The importance of medical practices, cultural beliefs, technologies (e.g. surveys, drug urinalysis, psychological treatments, 12 step programs and psychopharmacological interventions) for responding to the problem will be examined. Epidemiological and ethnographic studies done by researchers at the Division of Neuropsychiatry – Walter Reed Army Institute of Research (organized by David H Marlowe PhD and Larry Ingraham PhD) will provide an appreciation of the organization of substance use at the unit level. From the 19th-century, the US military had substance abuse problems related to alcohol, and various other drugs, e.g. opiates and marijuana at the beginning of the 20th century. Tobacco use and abuse were

encouraged. Alcohol abuse and dependency were recognized as significant contributors to medical problems and accidental injury, and encouraged through the institutionalization of alcohol use, and the provision of social and economic incentives. Social customs, service institutions, unit organization, demographic factors, interpersonal unit cohesion/ social support systems, social contagion, and unit leadership were important to the epidemiology of substance abuse in the military and will be examined in this brief snap shot of the historic epidemiology of substance abuse. The organizational insights provided by these studies emphasized the importance of unit climate and cohesion. These findings contributed to the restructuring of the military (particularly the US Army) after the end of the draft. It established the importance of monitoring certain risk behaviours in young civilian populations to predicting future risks of substance abuse in the military. The steps taken to reduce military performance decrements created by substance abuse will be presented. Successes and failures will be examined. The potential of integrating social and neurobiological findings into risk management will be briefly examined. Some approaches to preventing the mistakes of the past will be suggested - the most important of which are eternal vigilance, attention to unit climate and leadership, and a military medical system alert to the health and performance risks of substance misuse.

Prof. Holloway is presently at the F. Edward Hébert School of Medicine where he serves as Professor of Psychiatry and Professor of Neuroscience. Prof. Holloway is the author of more than 200 hundred articles, book chapters and major reports. He is Life Fellow of the American Psychiatric Association (APA) and has received the APA's Distinguished Psychiatrist Award. Prof. Holloway was awarded the honorary degree of Doctor of Military Medicine by USUHS in 1992. He has received the Legion of Merit and Defense Superior Service Medal. He has received NASA Medals for Leadership, Distinguished Public Service, and Distinguished Service.

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Australian Defence Force Nursing Undergraduate Scheme – Are We Getting It Right?

A Craig

Currently the Australian Defence Force (ADF) recruits its nurses directly from the civilian population, with appointment open to all nurses with a minimum two years postgraduate experience. Alternatively, individuals who have completed one year of university training can apply to be accepted on the Undergraduate Scheme. Under the Scheme trainees are paid a wage and their educational expenses, including HECs, are covered by their respective Service – Army, Navy or Air Force. Post registration, nurses work for two years in civilian hospitals before undergoing Service specific training and being posted to an Army, Navy or Air force unit.

This paper discusses an informal assessment of how the Scheme is faring from the perspective of its participants. With permission of The Director of Defence Force Nursing (DDFN)

and each Service's category sponsor, the participants on the scheme were invited to submit comments addressing their expectations, why they joined the Scheme, what they felt worked well and what needed to be improved.

Most comments have been very positive but there were some common themes from nurses in each service. These mostly related to a lack of mentoring, feeling disconnected from their branch of Service and resoundingly that communication and administrative matters related to their Service were poorly handled. Many expressed disillusionment and discontent. Some suggestions made by participants were more regular contact with the military environment, better communication and a more robust mentoring scheme.

These themes may have ramifications for the individuals' ability to adjust to military life and indeed for personnel retention and as such, should be addressed. Some implications for further research are a study of participants whilst undergoing service specific military training and a review of exit surveys of members who have resigned from the Scheme and from the military in order to quantify the effect of the concerns and issues raised by those on the program.

The ADF Nursing Undergraduate Scheme provides a viable means of attaining a nursing degree and pursuing challenging and meaningful employment. It has been instituted to be mutually beneficial to the members and to the ADF. This paper has sought to establish how the participants judge its success. It has found that on the whole members are very happy with the Scheme. They raised some issues that could be easily divided into common themes. These could conceivably effect their transition to military life and their choice to remain with it. They also submitted many constructive ideas on how the Scheme could be improved for the continued and enhanced benefit of all concerned. Their comments may also have implications for further, more extensive research into nursing recruitment and retention issues, a topic that is very salient in all fields of the nursing profession today.

Anne Craig is a member of the Royal Australian Air Force and The ADF Undergraduate Nursing Scheme, graduating with Distinction from the University of Wollongong in 2004. She has previously presented a paper on the benefits of the Scheme to the delegates of the Royal College of Nursing Conference. She is interested in maximising the benefits for both the ADF and members and to this end believes that participants in the Scheme have valuable input to make.

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Preparing Communities for Disasters: The Role of Environmental Health Professionals

BA Ferrier, JT Spickett

Keywords: Environmental Health Professional, Disaster Prevention, Mitigation, Water Supplies, Sanitation, Community Vulnerability

Inadequate water supply and sanitation services underscore the lives of billions of people in the developing world. This situation is compounded when natural disasters strike because the existing infrastructure is destroyed, and scarce resources

are diverted to cope with the emergency/crisis and then the reconstruction. In comparison, many industrialised countries have prevention measures in place to reduce the risk of damage, and policies and actions in place to reduce the impact of the next disaster. Environmental health professionals can play an important role in disaster prevention, mitigation and response in these situations. However, the success of environmental health programs does depend on the existing social inequities. This is because in many developing countries, the poorest and least powerful people already live in a situation with poor water supply and sanitation which is compounded by natural disasters.

Lieutenant Commander Bronwyn Ferrier was raised in the Yass district of NSW and educated at Canberra Girls Grammar School. She completed her general nursing training at Royal North Shore Hospital in 1987, and completed her midwifery training at the Royal Hospital for Women, Paddington in 1990. On completion of her midwifery training, Lieutenant Commander Ferrier then spent four years living and working in the Northern Territory. She joined the RAN in January 1994. Since joining the RAN, LCDR Ferrier has completed a variety of postings at both the operational and strategic level. She is currently the Officer in Charge of the Fleet Industrial Hygiene Support Unit (FIHSU) which was formerly the environmental medicine unit. FIHSU provides direct support to the RAN fleet which consists approximately 64 vessels and 4,200 people on a range of industrial hygiene issues in order to preserve the health, well being, and morale in Fleet units. The paper she is presenting today forms part of her Master in Public Health research dissertation.

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Pertussis Outbreak in the Liverpool Military Area – A case study of infection control procedures during an infectious disease outbreak.

L Lougheed*, M Lakos

31 cases of Pertussis (whooping cough) were identified in the Liverpool Military Area in the period April to July 2006.

Pertussis has become an increasingly important cause of illness in adults. Being a highly infectious organism, living arrangements such as military barracks, create the opportunity for rapidly escalating outbreaks.

Clinical presentations of Pertussis are discussed, as well as currently available diagnostic modalities. The medical management of active duty members, their contacts and their dependants (both paediatric and adult) is discussed.

We will discuss the development of infection control procedures in collaboration with Defence and local health authorities, and how the lessons learnt during this outbreak are applicable in the advent of more serious outbreaks such as pandemic or avian influenza.

Sr Lougheed has extensive nursing experience in both the Defence and Public Health system. She is the Infection Control Coordinator at 1st Health Support Battalion, Holsworthy Barracks.

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Medical Leadership in the Military – Rank Should Not Always Have Its Privileges

T Austin

Medical leadership is becoming an integral component of modern clinical governance. While leadership is a skill that is demonstrated and recognised across all strata of society, in business and in sport, the military is seen by many to have developed it to as both an art and a science. In the military context successful leadership is a highly desirable trait and much time is spent developing natural talent and teaching the theory. The irony is that military leadership is exercised within the context of a rigid hierarchy of rank. It is the military rank held by an individual that ultimately dictates whether subordinate members comply with the wishes of the leader rather than their innate ability to lead.

In the clinical context of health care delivery the concept of rank is not always as well articulated as it is in the military. However other factors traditionally provide a level of authority that is almost as rigid as rank. These factors include such obvious things as professional qualifications and experience. They also include less obvious factors such as gender, age and ethnicity.

This paper will explore the friction that can arise when military leadership based upon the authority vested in rank comes into conflict with clinical leadership. Several models of leadership will be explored in order to best identify a way ahead that enhances clinical effectiveness and maximises patient safety.

Air Vice-Marshal Tony Austin was commissioned into the RAAF as a medical undergraduate in 1980. Tony has served as a medical officer in Australia and has had tours of duty in Malaysia and with the United States Air Force in Virginia. Tony has commanded the RAAF Institute of Aviation Medicine and 3 RAAF Hospital. For the past 9 years he has held senior medical staff appointments culminating in his current position as Head Defence Health Services in Canberra. Tony has a strong interest in all facets of clinical governance with a particular emphasis upon patient safety.

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Why Can't We All Just Get Along? The Doctor Nurse Relationship in the ADF

TL Smart

One would like to believe that the relationship between doctors and nurses has undergone a seismic shift in the past 50 years as the two employment groups themselves have changed dramatically. Where nurses used to qualify by on the job training, usually provided by doctors, they are now highly educated professionals, recognised in their own right. Gone are the "Doctor's Handmaidens" of years gone by, the poorly paid slaves of the hospital system. Gone too are the definitive gender differences that separated the two groups – the male doctor and female nurse. Yet the relationships and stereotypes

of the past continue to reflect upon interactions today. Professional medical organizations such as the Australian Medical Association continue to make outlandish statements about perceived encroachments of nurses into the traditional domain of doctors and many nurses make assumptions that doctors view them as second class citizens. One would expect that in the military, in which both groups can achieve equal status as officers, these stereotypes would prove irrelevant. However the doctor nurse game still goes on in an environment where health personnel should be more concerned with the enemies without than those within.

Dr. Tracy Smart entered the Royal Australian Air Force (RAAF) in 1985 as an undergraduate, and graduated from Flinders University in 1987. She has served as a medical officer at RAAF bases around Australia, has completed overseas postings with both the Royal Air Force and the United States Air Force, and has been deployed to Rwanda, Malaysia, East Timor and the Middle East. She completed the UK Diploma in Aviation Medicine in 1992. Dr. Smart has served as Chief Instructor and twice as Commanding Officer of the RAAF Institute of Aviation Medicine. In August 2005 she was promoted to GPCAPT and posted to her current position as Officer Commanding Health Services Wing.

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Preventing genital HPV infection and associated diseases by vaccination

I Frazer

Uniquely amongst human cancers, cancer of the cervix can be entirely attributable to an infectious agent. Detailed epidemiological evidence has allowed the conclusion that a subset of about 10 human papillomaviruses, termed high risk, are responsible, and two types (HPV16 and HPV18) account for more than 70% of cancers. Infection with high risk human papillomaviruses is extremely common, with up to 50% of women becoming infected during the first 5 years after commencing sexual intercourse. Up to 98% of these infections regress without intervention. Persistent infection conveys substantial risk of cervical cancer.

Genital warts are caused by two further human papillomaviruses, HPV6, and HPV11. While these do not predispose to cancer, the infections are common and persistent, and the cause of considerable morbidity and treatment expense.

Prevention of cervical cancer at present relies on screening programs which are designed to detect premalignant changes (HSIL) in squamous cervical cells, Future programs will likely be based on vaccines to prevent genital HPV infection now licenced in the USA, and Australasia. If administered prior to sexual activity, one of these vaccines, Gardasil, which provides protection against four HPV types (6, 11, 16 and 18) will prevent up to 70% of cervical cancer in an unscreened population, the majority of abnormal pap smears in screened populations, and >90% of genital warts HPV vaccines should not impact on present cervical cancer screening programs, because they protect against only the two types of HPV associated most commonly with cervical cancer.

Immunotherapeutics designed to eliminate existing HPV infection are at an earlier stage of development. Thus, future strategies to reduce the burden of HPV associated genital disease including cancer are likely to focus on HPV prophylactic vaccines

Ian Frazer is Director of the Centre for Immunology and Cancer Research, a research centre of the University of Queensland at the Princess Alexandra Hospital in Brisbane. Dr Frazer teaches immunology to undergraduate and graduate students of the University. He is on the board of, chairs the Medical and Scientific advisory committee of, the Queensland Cancer Fund. He is vice president of the Cancer Council Australia.

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Genesis of Malaria Epidemics and its Impact on Military and Humanitarian Operations

GD Shanks

Introduction: Malaria epidemics are one of the few infectious diseases capable of completely shutting down military operations.

Methods: Literature and experience of recent and historical malaria epidemics was reviewed.

Results: Malaria epidemics typically occur in areas of marginal transmission when either population or climatic conditions suddenly favour the malaria parasite. Insertion of non-immune populations into highly endemic areas also create malaria epidemics capable of shutting down military operations, disrupting refugee movements or severely curtailing all normal civilian activities. Malaria epidemics have notably occurred in the Punjab following floods, Sri Lanka following failure of the monsoon, and the East African highlands following the introduction of chloroquine resistance. Climatic changes have only marginally explained these outbreaks compared to man-made modifications of the environment. Examples of military operations stopped due to malaria epidemics include Salonika 1917, Milne Bay and Guadalcanal 1942, Ia Drang Valley 1965 and Thai border operations in the late 1980s. Control of malaria epidemics during military operations is extremely difficult and has often required repatriation of entire units to non-endemic areas. Disruption of refugee flows along with mass mortality has been seen during the Japanese invasion of Burma 1942, Khmer Rouge retreat from Cambodia 1979 and Somali refugee camps in Kenya 1998. Malaria infection so debilitates refugees that they are unable to flee to the safety of non-conflict areas.

Conclusions: Drug resistance increases the number of persons with suppressed infections capable of infecting mosquitoes. Only a very small initial parasite population is required to seed a malaria epidemic when circumstances favour survival of the mosquito vector. Malaria epidemics may occur very suddenly necessitating careful pre-planning for any military or humanitarian operations in malaria endemic areas.

Prof G Dennis Shanks is the current Director of the Army Malaria Institute at Gallipoli Barracks, Enoggera. A retired

Colonel from the US Army Medical Corps, he has spent most of his military career working on malaria in Thailand and Kenya. Dr Shank's particular interests are the prevention of malaria in military groups and epidemic malaria.

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The Effect of Other Deployments in Assessing the Health of Australian Gulf War Veterans

HL Kelsall*, JF Ikin, DP McKenzie, DC Glass, AB Forbes, MR Sim

Introduction: In the Australian Gulf War Veterans' Health Study, veterans of the 1991 Gulf War demonstrated poorer psychological health and increased risk of fatigue related outcomes including medically unexplained chronic fatigue than did a military comparison group. However, 67% of the military comparison group had never been actively deployed. The aim was to investigate whether excess risk of psychological disorders and fatigue related outcomes in Gulf War veterans could be explained as an 'active-deployment effect' rather than an effect more specific to the Gulf War deployment itself.

Methods: Comprehensive medical, psychological, fatigue, and exposure assessments were performed in a cross-sectional study of 1456 veterans and 1588 randomly sampled military comparison group subjects who were in operational units at the time of the Gulf War but not deployed to that conflict. Prevalences of DSM-IV psychological disorders were measured using the Composite International Diagnostic Interview. Military active deployment (war or peacekeeping) and exposure history and other health data were collected by postal questionnaire. Fatigue related outcomes including chronic fatigue and medically unexplained chronic fatigue were evaluated according to the international 1994 chronic fatigue syndrome case definition.

Results: The odds ratios of posttraumatic stress disorder {OR 2.2 (95% CI 1.1-4.6) vs 4.1 (2.4-7.2)}, any psychological disorder {1.4 (1.0-2.0) vs 1.7 (1.4-2.1)}, any anxiety disorder {1.9 (1.1-3.1) vs 2.2 (1.6-3.2)} and Posttraumatic Stress Disorder Checklist-Specific caseness {1.9 (1.1-3.1) vs 2.0 (1.5-2.9)} remained significantly elevated and the mean difference in Short-Form 12 mental health score {-2.5 (-3.6, -1.4) vs -3.4 (-4.2, -2.6)} remained significantly lower (worse) when Gulf War veterans were compared with the comparison subgroup (33%) who had been on at least one active deployment than when all comparison group subjects were included. The odds ratios of chronic fatigue {1.5 (0.8-2.7) vs 1.9 (1.4-2.7)}, unexplained chronic fatigue {1.6 (0.8-3.2) vs 2.3 (1.6-3.4)}, any affective disorder {1.5 (1.0-2.4) vs 1.7 (1.2-2.2)}, and General Health Questionnaire caseness {1.1 (0.9-1.4) vs 1.4 (1.2-1.6)} were no longer significantly elevated when Gulf War veterans were compared with the comparison subgroup who had been on at least one active deployment than when all comparison group subjects were included.

Discussion: Some but not all differences between the health of Gulf War veterans and a military comparison group

can be explained partly as an ‘active-deployment effect’. The opportunity for full investigation of this effect is limited, however, by the relatively small number of comparison group subjects reporting active deployments and by the varied destinations and nature of these deployments. An active deployment history should be included in the exposure assessment in future health studies of veteran and military populations.

Dr Helen Kelsall is a Senior Research Fellow at the Department of Epidemiology and Preventive Medicine, Monash University. She received her PhD in 2005 for her research on respiratory and neurological health, symptoms, medical conditions and chronic fatigue syndrome in Australian Gulf War veterans – and was awarded the Monash University Vice-Chancellor’s Commendation for Doctoral Thesis Excellence in 2005. Helen is currently undertaking a NHMRC Postdoctoral Fellowship, initially at The Cancer Council Victoria from 2006-2007, but maintains an active interest in veteran health research.

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Critical Care in the Air: Training Civilian Specialists for Military AME

J Lumsden, K Douglas

In recent years the increased operational tempo of ADF forces, combined with changes to the types of military operations and the structure of Defence has resulted in a review of Aeromedical (AME) services within the RAAF and wider Defence arena. Disasters such as the Asian Tsunami along with the current ‘terrorist environment’ and the resultant Bali bombings, have increased the need for prepared and trained specialist personnel to augment AME teams in order to provide critical care support in flight to critically ill or injured patients. One of the challenges in meeting this requirement is to provide robust training to specialist health personnel, often Reservists, within a military environment.

‘Critical care in the air’ is a significant military capability that has been formalised in the USA, and to a lesser extent within Britain, over the last 10 years. It has been one component credited with providing significant decreases in patient mortality and has allowed early evacuation of seriously ill or injured personnel out of an area of operations and onto more advanced care. Treatment that may have been delayed previously.

The military environment is often unique due to the numbers of patients transported and the adverse conditions they are transported in. Equipment limitations and poor working conditions within large airframes designed primarily for transportation of cargo, creates an aviation environment far removed from those of civilian AME and the security of a contemporary Australian hospital setting. Within the next twelve months RAAF plans to inaugurate the Military Critical Care AME Team (MCAT) concept and pilot an exciting new course which will provide training to specialist health personnel to meet the requirements of this capability.

This presentation will explore the training requirements and capability outcomes the inception of such a program will

bring. In addition it will highlight the ongoing challenges of integrating a new capability into the existing system. It has taken the USAF more than ten years to develop their existing capability within the realms of Critical Care Air Transport. This current evolution in AME training will provide a valuable asset to the ADF with relevance across the greater public arena.

FLTLT Douglas is a Registered Nurse and RAAFSR member with post graduate qualifications in training. Over the last six years she has had significant involvement in the development of the BMA/AMA courses for ADF Medical Assistants including alignment of training to civilian qualifications. In addition she has been responsible for the curriculum development and remodelling of the MEDASST Ambulance course, Operational Health Support course, Fixed and Rotary Wing AME courses, Aviation Medicine Nursing Officer Course and the inception of Refresher training for AME. FLTLT Douglas currently works at HQHSW, RAAF Amberley.

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Time and Space – Relativity in Trauma

WM Griggs

In the 21st century the accepted medical approach to acute trauma care involves following ATLS/EMST principles. These are used at all levels of medical sophistication from first aid to critical care. The ATLS/EMST system, although slightly modified from time to time, has been around for over 20 years now and is widely accepted as gospel. Controlled trials “prove” it gets optimal results, or do they?

As a first year medical student I was told by one of my professors “... about 50% of what you will learn during your medical course will ultimately be found to be wrong. We just don’t know which 50% yet...” Medicine is still largely an art. We believe that we use “scientific methods” to decide on best practice. We talk about evidence based medicine. However, our gold standard is the randomised controlled double blind trial. The outcome is nearly always expressed as a percentage probability that an observed effect is due to chance and a 1 in 20 likelihood that this just due to chance is called “significant”. Is there any branch of science which uses this sort of methodology as its gold standard? If engineers used such an approach to building bridges would we be happy to cross them?

How would an engineer or a physicist view trauma? Trauma can be defined as the effect on the human body of external force(s). In physics force = mass times acceleration. Acceleration is rate of change of speed over time. Speed is rate of change of distance over time. So force involves mass, distance and time. Clearly time and space are integral components of force and thus of trauma. This presentation attempts to look at trauma from the perspective of “time and space”. By using a different perspective perhaps we can improve our understanding and maybe also open our eyes to different possibilities.

Dr Bill Griggs is Director of Trauma Services at Royal Adelaide Hospital. His trauma experience includes 15 years as

a paramedic in South Australia and he continues to work as a Regional Medical Officer for the South Australian Ambulance Service. He has dual specialist qualifications in Intensive Care and Anaesthesia as well as a post graduate qualification in Aviation Medicine. He has a major involvement in aeromedical transport and rescue has performed over 700 aeromedical evacuations in over 30 different aircraft types including half a dozen maritime winch rescue operations. He is in the Royal Australian Air Force Specialist Reserve and has served operationally overseas on a number of occasions.

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Clinical Trials Using Antimalarial Drugs at the Army Malaria Institute 1998-2004

G. D Shanks

Introduction: Malaria is one of the few infectious diseases capable of completely shutting down military operations. Current prevention of malaria using drugs is sub-optimal such that better forms of chemoprophylaxis are required. The Army Malaria Institute (AMI) has conducted a series of clinical trials to develop more effective regimens both to protect soldiers in the field and following their return to Australia. We report a summarised account of the last 10 clinical trials done in Australian soldiers over the period of 1998-2004 and outline possible future avenues of research.

Methods: Records and reports at AMI covering 10 separate antimalarial drug clinical trials conducted from 1998-2004 involving 3600 volunteers were reviewed.

Results: Four chemoprophylaxis trials were conducted: doxycycline vs atovaquone / proguanil, tafenoquine vs mefloquine, two iterations of mefloquine vs doxycycline. All four drugs tested could adequately prevent malaria during actual operations when taken as directed. Soldiers preferred the weekly regimens of tafenoquine or mefloquine compared to daily medication. Four post exposure prophylaxis / treatment trials were conducted: three iterations of tafenoquine vs primaquine and a compressed schedule of primaquine. Tafenoquine for 3 days prevented vivax relapses to the same extent as 14 days of primaquine (either 22.5 or 30 mg QD) but tafenoquine was much easier to both administer and ingest. Post exposure primaquine could be compressed by doubling the current 30 mg QD for 14 days to 30 mg twice a day for 7 days without effecting tolerance. Tafenoquine given as a loading dose of 200 mg QD for 3 days followed by 200 mg weekly for 8 weeks cured 26 of 27 soldiers treated for repeated vivax relapses after return to Australia. The pharmacokinetics of a single 30 mg dose of primaquine did not differ by gender when administered to 18 healthy soldier volunteers.

Conclusions: Malaria remains a threat to any tropical deployments of the ADF despite having three separate effective regimens for chemoprophylaxis and a variety of post exposure treatment regimens of varying effectiveness. Given the current situation in the tropical areas north of Australia, it is highly likely that the ADF will continue to be exposed to malaria during deployments. Improved means of preventing malaria particularly for post deployment vivax relapses need further development and field testing.

Professor Dennis Shanks is the new Director of the Army Malaria Institute on Gallipoli Barracks in Enoggera. He is a retired US Army Medical Corps Colonel with extensive overseas experience in SE Asia, Thailand and Central America. Dr Shanks' main interests are clinical trials of new antimalarial drugs and how to adapt old drugs to better address military operational requirements.

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Mortality and Cancer Incidence amongst Australian National Service Vietnam War Veterans

EJ Wilson*, KWA Horsley, R Van der Hoek

Introduction

Australian Defence Force (ADF) personnel participated in the Vietnam Conflict from 1962 to 1973, involving nearly 60,000 personnel. Between 1965 and 1972, the Australian government introduced a National Service (NS) scheme of conscription to provide personnel for the war effort. Men were selected by ballot based on their birthday at age 20. Following medical, psychological and educational assessment screening, those deemed fit for service were enlisted into the Army and after completing basic training were allocated to an operational unit within an Army corps. Selection for service in Vietnam was by corps. This selection process essentially resulted in a natural experiment of random selection of age-matched, fit, healthy men for Vietnam service.

Materials and Methods

A study roll of NS personnel who satisfied the selection criteria of complete personal details and for non-veterans (NS_v), at least one year in service, was matched by name and date of birth with a number of national databases to determine vital status, cause of death and cancer incidence. Cancer incidence was assessed for the period of 1982 to 2000, and mortality was assessed from the time of completion of Vietnam service (or age 22 for NS_v) to 2001.

The relative rates for a direct comparison of mortality and cancer incidence of veterans (NS_v) to NS_v were calculated using the person-year method by applying the rates for the whole NS group to determine the expected numbers of deaths/cancer cases for NS_v and NS_v and dividing the ratio of observed to expected deaths/cancer cases for the two groups. Standardised incidence and mortality ratios were also calculated using the person-year method. The expected number deaths by cause or cases of cancer by cancer type was calculated by applying age-specific incidence/mortality rates for the Australian male community to the number of living NS_v or NS_v in that age group in each year.

Results and Discussion

The NS cohort consisted of 43,969 personnel, 19,240 NS_v and 24,729 NS_v. NS_v experienced a 23% higher overall mortality compared to NS_v. Mortality from digestive system diseases (primarily liver disease) was more than double that observed in NS_v. Deaths from motor vehicle accidents and suicide were

significantly elevated, as was mortality from cancer of the lung and pancreas.

Mortality from mental disorders and neoplasms was also elevated, but of borderline statistical significance. There were no causes of death for which NSv had a statistically significant lower mortality rate than NSnv.

Overall, a strong healthy worker effect was still evident for this cohort, SMR = 0.73 (95% CI 0.70, 0.76) but cancer incidence did not differ from community rates, SIR = 0.96 (95% CI 0.92, 1.01).

In conclusion, two groups of fit healthy men who were enlisted into military service more than 30 years previously were compared. Those who served in the Vietnam War experienced higher levels of mortality and cancer incidence than those who served in Australia.

Dr Keith Horsley has worked in the area of veterans' health, working mainly on mortality and cancer incidence studies of Australian veterans.

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Medical Officer Specialist Training in the Defence Health Services

IJ Young

Introduction: On 23 August 2001 the Medical Officer Specialist Training Scheme was created in order to enhance the capability of the DHS with respect to deployed level three health support. A handful of regular force medical officers have taken up specialty training and it is time to review the process by looking at current trainees.

Methods: The selection process and scope of MOSTS is described in DI (G) PERS 5-31. The author was provided with 12 months of refresher training after completion of ROSO in order to complete Basic Surgical Training. A further 12 months of LWOP was required as a non-accredited Orthopaedic Registrar prior to being selected into Advanced Training in Orthopaedic Surgery. Once selected into training a formal application for sponsorship under MOSTS was lodged and approved, incurring ROSO of 24 months.

Results: The author is currently in the third of a four-year training programme and is preparing for the Fellowship Examination in 2007. Training will be completed by February 2008 at which time a cycle of employment either on PTLWOP or deployment will commence. While on PTLWOP, specialist skills are to be maintained mainly within the public hospital system.

Discussion: The desire for clinical specialty training is an issue for many medical officers in the ADF and has often been a reason for discharge or transfer to the Reserves at the completion of initial ROSO. The road to MOSTS requires flexibility within the system in order to allow eligible medical officers the time off to meet the necessary criteria for selection into advanced training. While being sponsored under MOSTS pay becomes an issue for the civilian hospitals to cope with. The quarterly reimbursement of excess hospital salary causes delay in additional remuneration above the Defence salary. The reimbursement of expenses under MOSTS relies entirely on the CPD entitlement, which is inadequate and requires

further funding under Civil Schooling. The time off necessary to complete routine military requirements such as medical, dental and physical fitness assessments is difficult when employed in the civilian system. The contact with the military is sporadic and essentially driven by the member. Officer Appraisal and competitiveness for promotion are affected by being on MOSTS. Stream-lining of specialist training throughout the three services could be achieved with a single desk officer within DHS coordinating all aspects of the training and liaising with relevant single service authorities. The benefits of having full-time specialist medical officers will only be known in the next 10 years once a number are available for immediate deployment. This paper is presented with the intention of highlighting this career path, raising the issues that have arisen thus far and generating discussion for future directions and supervision of specialist training in the ADF.

LCDR Ian Young transferred to the Royal Australian Navy in 1998 as a Medical Officer after 8 years in the Canadian Forces. Postings have included HMAS CERBERUS, Underwater Medicine at HMAS PENGUIN, and Operation RELEX in HMAS WARRAMUNGA. LCDR Young is currently in his third year of Advanced Training in Orthopaedic Surgery in Victoria and Tasmania under the Medical Officer Specialist Training Scheme.

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Blast Trauma from an Australian Perspective and Possible Ramifications for Australian Defence Force Health Personnel

DA Andrew

Australia is not immune from world events, and increasingly the use of bombs has had a direct impact on Australian citizens and property. Internally there have been bombing on consulate – generals and government meetings in the 1970's and 80's, and from 1995 – 2004 there were 2767 bombings in Australia. Externally there have been the bombings in Bali, where Australian citizens were killed and wounded and evacuated home for treatment, and the Embassy bombing in Jakarta.

Defence Health Personnel will come across blast-injured patients from the initial treatment, transportation, hospital stay, and rehabilitation to outpatient and community settings. A greater understanding of the mechanisms involved and treatments will better able them to care for their patients.

The objective of this paper is to briefly explain the four mechanisms of blast injury and their effect on body systems, the process of treatment of blast specific injuries, the rehabilitation of injuries, with an emphasis on the care post hospital from a scientific perspective.

The information available on bombings range from respected scientific research and authors to journalistic sensationalism and the inevitable 'talking heads' from television that appear whenever an event arises. Some are excellent but unfortunately some are just an individual found

to fill in a minute of news space. These tend to cloud the issue, and the information gained from the media is often taken as gospel and with explosions in movies often the only exposure to the concept of what happens.

David Andrew is a Registered Nurse in Queensland Health and the Army Reserve and has been a member of the Australian Defence force since 1977. He has presented on military medicine nationally and internationally and is a previous winner of the AMMA Weary Dunlop Award. His main interests are in terminal effects and protective mechanisms.

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Soldier's Use of personal Protective measures Against Arthropodbites and Arthropod-associated Disease: A Survey among Canadian Force Members Deployed in Kabul, Afghanistan in 2005

F Crane*, M Tepper, B Strauss, J Whitehead, S Schofield

Introduction

Personal protective measures (PPMs) are a mainstay for preventing arthropod bites (AB) and arthropod-associated disease (AAD) among deployed military personnel. Studies of compliance with recommended PPMs usually report inadequate uptake; however, such studies seldom report beliefs and behavioural correlates of uptake. This study measured uptake of PPMs, i.e. wearing permethrin treated uniforms (PTUs); applying insect repellent containing DEET; and sleeping under bed nets treated with permethrin, among Canadian Forces (CF) members deployed to Kabul, Afghanistan. The study also evaluated several factors that likely influence uptake, i.e. beliefs regarding susceptibility to and seriousness of AB and AAD; perceived problems with the PPMs; "support" (being reminded to use PPMs); and access (availability) of PPMs.

Methods

This cross-sectional, survey used a self-administered, pre-tested questionnaire with open and closed ended questions. The study group consisted of 740 CF members participating in the multi-national peace keeping effort in Kabul in the summer of 2005.

Results

The response rate was 92%. Self-reported adoption of specific PPMs were: 79% treated most or all of their uniforms with permethrin; 21% slept under bed nets; and 11% used insect repellent. Compliance with all three was reported by 4% of respondents. Access to PPMs was a problem for 3 to 6 %. Being reminded to use PPMs was reported by 13% to 27%. High perceived susceptibility to AAD was significantly associated with uptake of PTU (OR: 2.61, CI: 1.73, 3.94), using repellent (OR: 2.65, CI: 1.76, 4.00), and sleeping under a bed net (OR: 3.5, CI: 2.43, 5.06). Higher perceived seriousness of AAD was associated with repellent use (OR: 1.58, CI: 1.05, 2.38). And "support" was significantly associated with repellent use (OR: 2.85, CI: 1.67, 4.89), and

bed net use (OR: 5.32, CI: 3.57, 7.93). Handwritten comments indicated barriers to uptake were: health and safety concerns (DEET and permethrin); a preference for repellent products not routinely supplied by the CF; discomfort associated with using repellent and bed nets; and difficulty using bed nets.

Discussion

Uptake of PPMs was low except for wearing PTUs. Uptake was enhanced when: the soldier's perceived susceptibility to and severity of AAD were higher; when there was "support" for the use of PPMs; and when there were fewer perceived barriers to using PPMs. Results suggest uptake of PPMs could be improved by focusing risk communication on; susceptibility and seriousness of AAD; and the efficacy, safety and proper use of PPMs. Support or simply reminding soldiers to use PPMs is influential for uptake; unit senior non-commissioned members may be critical in this regard. There may be a need to develop or acquire new PPMs but before introducing a new PPM user acceptability needs to be better addressed.

Fiann Crane is a Public Health Nurse who works with Force Health Protection as a Senior Advisor in the communicable disease control section for the Canadian Forces Health Services. The study she is about to present was a component of her MSc in Infectious Disease, completed at the University of London, School of Hygiene and Tropical Medicine.

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Continuing Competence to Practice - A Challenge for Defence Force Nursing Officers

EA Davies

This paper explores the particular challenge faced by Defence Force Nurses in maintaining their continuing competence for clinical practice. Frequently, nursing personnel are engaged in non-clinical activities or are practising at less acute or critical clinical levels. However, they must be prepared to function rapidly, effectively and safely whenever required in extreme circumstances.

Strategies for maintaining and enhancing clinical competence are proposed. These include: planned civilian clinical practice rotations; continuing education programs; and the acquisition of formal award qualifications. Each is explored and evaluated in terms of its capacity to achieve desired outcomes.

A feature of this paper is its emphasis on the collaborative relationships between the defence and civilian nursing and educational sectors in working towards meeting the challenge of continuing competence to practise.

Elizabeth Davies trained as a nurse at the Grafton Base Hospital in New South Wales. Her clinical focus has been on neurosurgical nursing and aged and dementia care. She has actively pursued higher education and has had a long association with hospital based and tertiary nurse education. In 2004 she was appointed as the foundation Professor of Nursing at the University of Queensland and became the first

Head of the UQ School of Nursing in 2005. Prior to coming to UQ she was responsible for setting up and leading the Queensland School of Nursing of Australian Catholic University. She has a particular interest in educational innovation and has developed and implemented a number of new curricula in undergraduate and postgraduate nursing and midwifery education. She has developed a major research focus around the capacity building outcomes of educative processes in health professional education.

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Wound Management in Injuries from Blows, Bullets, and Blasts

PF Sharwood

From the time of wounding until definitive surgery and wound closure, the management of injured soldiers and civilians should at all times seek to achieve the best outcome. This paper describes the types of wounds that can be expected to be encountered from a variety of incidents. Mine injuries, bullet wounds, vehicle accidents and the effects of Improvised Explosive Devices will be discussed.

The paper looks at the types of wounds, the initial response in control of haemorrhage and underlying pathology. It covers wound management in the emergency room and discusses the problems likely to be encountered in the patient's management, in the field, the Resus Bay and the operating theatre.

The paper draws on the author's extensive experience with wounds both warlike and non warlike encountered in Rwanda, Bougainville, East Timor, Aceh and Iraq.

Colonel Sharwood has had extensive experience as a deployed Orthopaedic Surgeon having served in Rwanda, Bougainville, East Timor, The Solomon Islands and Iraq. He was in the first group of surgeons to treat casualties from the Tsunami in Aceh. He has been responsible for the management of patients under less than ideal conditions having deployed overseas 11 times to conflicts and disasters in the last ten years.

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Can We Improve Compliance with Primaquine and reduce the incidence of *P. vivax* malaria in the ADF?

SM Bennett*, NJ Elmes, PE Nasveld, TL Carthew, KH Rieckman

Introduction: Adherence with the component of prophylaxis required on leaving a malarious area (terminal prophylaxis) has generally been poor. Evidence suggests this is also true of Service Personnel leaving malarious areas. This may be contributing to the high rates of *P. vivax* malaria seen in ADF personnel following operational deployment to areas such as East Timor. It is imperative that new eradication regimes be evaluated following malarial exposure to assess

issues of tolerability and efficacy and to confirm the suitability of the newer regimes to use in the ADF. We tested shorter regimens of primaquine (with higher daily doses) that could inspire compliance.

Methodology: We conducted an open-label prospective clinical trial pilot study in which participants were allocated to one of three primaquine eradication regimes: 30 mg daily for 14 days (Group B); 45 mg once daily for 9 days (Group C); or 30 mg twice daily for 7 days (Group D). Compliance and adverse effects were monitored via a daily study diary and also by questionnaire and interview at the scheduled visit (around the time of completion of the eradication course). Safety was monitored by the measurement of routine haematological and biochemical parameters pre-study and at the scheduled visit. For the 6 months post eradication, subjects were monitored for the occurrence of malaria via the Central Malaria Register (CMR).

Results: Groups B, C and D enrolled 34, 7 and 16 people respectively in their intent-to-treat populations. Two participants were withdrawn from the analysis: one in Group B that was lost to follow-up; and one in Group D who did not meet the inclusion criteria. The small number of subjects enrolled in the study precluded the use of valid statistical tests of hypotheses for analysis of adverse events, thus adverse events are tabulated and described. A total of 88 adverse events were reported. Gastrointestinal symptoms and tiredness made up 69% of all reported adverse events. The majority of adverse events (88%) were of a mild nature. Analysis of the haematological and biochemical parameters is underway. Preliminary analysis shows a significant reduction in haemoglobin levels over the duration of treatment for all treatment groups. This reduction is not clinically significant.

Discussion: High daily dose (up to 60mg) primaquine therapy was at least as well tolerated as the current standard dose of 30mg daily in this small pilot study. Larger studies are required to determine the significance of this finding. If higher dose/shorter duration primaquine regimes don't adversely affect tolerability, compliance may be improved. Doses higher than 15mg/day should only be dispensed in a well controlled environment with particular attention paid to testing for G-6PD deficiency. The suitability of the use of high dose primaquine regimes for terminal prophylaxis in Defence requires further discussion.

Dr Sonya Bennett MBBS FRACGP MPH&TM CMDR, RAN Sonya is a Medical Officer in the Navy and currently in the position of Research Manager at the Centre for Military and Veterans' Health. Sonya's research interests include tropical medicine and this particular project was conducted whilst Sonya was in the position of OIC Clinical Studies and Surveillance at the Army Malaria Institute.

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Cancer Incidence and Mortality in Aircraft Maintenance Workers

C D'Este*, J Attia, A Brown, R Gibson, R Gibberd, M Tavener, M Guest, K Horsley, W Harrex, J Ross

Introduction: A cancer incidence and mortality study was conducted in response to health concerns raised by workers from the F-111 aircraft deseal/reseal fuel tank maintenance programs. The aim was to determine whether F-111 aircraft personnel exposed to deseal/reseal fuel tank maintenance programs had an excess of cancer and mortality.

Methods: Computerised coded death data up to 2001 and diagnosis of cancer data to 2000 were matched for individuals involved in F-111 deseal/reseal activities and two Air Force personnel comparison groups. Exposed individuals were involved in F-111 aircraft deseal/reseal fuel tank maintenance programs undertaken at RAAF Base Amberley in Queensland between 1975 and 1999. Comparison individuals were drawn from RAAF Base Richmond in New South Wales for similar job, different base comparisons, and from RAAF Base Amberley for different job, same base comparisons. Numbers of deaths and cancers for all three groups were determined by record linkage to the National Death Index and the National Cancer Statistics Clearing House respectively, through the Australian Institute of Health and Welfare. Analyses excluded females because of small numbers and were weighted to adjust for differences in age, posting or exposure period and rank between exposed and comparison groups.

Results: 873 exposed, 7577 Amberley and 9408 Richmond comparison individuals were matched against death and cancer data, with 431 cancers and 431 observed deaths. Cancer incidence was higher in the exposed group, with marginally significant increases of 40-50% relative to comparisons. Mortality for the exposed group was significantly lower than for both comparison groups, likely due to survivor bias in the exposed group.

Conclusion: We conclude that on the balance of probabilities, there is an increased risk of cancer associated with having participated in F-111 DSRS activities.

Associate Professor Cate D'Este is currently working at the Centre for Military and Veterans' Health at the University of Queensland in the Deployment Health Surveillance Unit. She is a biostatistician and has previously worked for 10 years at the Centre for Clinical Epidemiology and Biostatistics at the University of Newcastle, NSW and has extensive experience in the design, conduct and analysis of a variety of research projects. Associate Professor D'Este is the Chief Investigator for the Defence deployed Solomon Islands Health Study, which is a study of the health of Defence personnel deployed to the Solomon Islands. She was one of the investigators for the Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP).

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Training and Credentialing the Military General Surgeon for the Australian Defence Force

J Rosenfeld

The deployed Australian military surgeon is potentially faced with a wide range of surgical problems including general trauma, bomb blast, missile injuries and surgery related to humanitarian and disaster management including obstetrics and gynaecology, paediatrics and tropical medicine. Clearly this is beyond the experience of most civilian general surgeons. ADF personnel who require surgery expect the same expertise in specialist care as to what they would receive in Australia although there needs to be some allowance for being in a remote and hostile environment. We have accepted the US War Surgery Manual with comments and modification from Australian specialists as a standard reference source. The EMST Course and the Definitive Surgery Trauma Course and its Military Module are pre-requisites for credentialing and deployment. The recently developed O&G Course of the O&G Consultative Group is also valuable. The Rural Surgery Training Program of the RACS is probably the closest we come to a broad general surgery training for deployment. Selected brief periods working in specialised units such as burns, thoracic surgery and neurosurgery or in large volume trauma centres (especially penetrating trauma) are also to be encouraged. Credentialing of the surgeon is essential prior to deployment. This is being done by a committee of experienced military surgeons of the General Surgery Consultative Group of the ADF. The same general issues also impact on other medical specialists and nurses.

Colonel Jeffrey V Rosenfeld is Chair General Surgery Consultative Group, Defence Health Service, Adjunct Professor Centre for Military and Veterans' Health (CMVH) University of Queensland, Assistant Editor 'ADF Health' and has deployed on multiple ADF operations. He is Professor and Head, Department of Surgery, Central and Eastern Clinical School, Monash University and Professor / Director of Neurosurgery at the Alfred Hospital.

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Challenges in Reconstruction of Massive Oromandibular Defects

A Bath

The fibula has rapidly become the most popular choice for micro vascular free flap reconstruction of large mandibular defects. Efforts are now focused on the use of microvascular free fibula osteocutaneous flap as a single flap for reconstruction of composite and massive defects of lower jaw and to obtain improvement in quality of reconstruction. Important elements of this approach have been defined based on experience of 30 consecutive cases. The bone defect involved central and both lateral segments in 14 patients, only central segment in 10 patients and one lateral segment in 6 patients. The soft tissue defect involved lining in 22 patients

and both lining and skin cover in 8 patients. Preoperative studies included in 3D CT scan, which was used to reconstruct a template of mandible. The template was used to shape a single reconstruction plate, which whenever possible was contoured to the exposed mandible. After completion of ablative procedure/recreation of defect, the reconstruction plate was fixed at the site of bony defect and it formed the exact template of mandible, to which composite bone flap was fixed after multiple osteotomies. While harvesting the flap, whenever both mucosa and skin required replacement, the skin flap was divided into 2 paddles, each based on its perforator. All flaps survived except partial loss of skin flap in 2 patients, which however got rapidly epithelised. Two patients developed recurrence of malignancy, one patient died on fifth postoperative day due to respiratory obstruction and another patient died due to septicemia. In all the surviving patients, postoperative results have been extremely satisfying.

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National Coordination for Mental Health Response to Terrorism and Disaster

B Raphael

The National Mental Health Disaster Response Committee is a group comprising of State and Territory directors of mental health and experts in terms of science and field expertise. Defence has major representation on this group. There is also a specialist child and adolescent group. The Chair is the expert mental health member on the Australian Health Protection Committee, which coordinates health response in the event of major emergencies, for instance response to terrorism, pandemic influenza. The MHRDC holds consensus meetings drawing scientific and field expertise together to provide advice re events such as the SE Asian Tsunami, Bali Bombings and so forth. The group meets face to face for consensus meetings and has provided reports on: core principles of mental health response; planning; research and evaluation; deployed teams; child and adolescent mental health; Psychological First Aid; and most recently on standards for education and training in this field. Some of these outcomes and activities will be presented.

Prof Beverley Raphael is Professor of Population Mental Health and Disasters, University of Western Sydney; Professor of Psychological Medicine at Australian National University; Emeritus Professor in Psychiatry from the University of Queensland and was previously the Director of Mental Health at NSW Health and is an internationally recognised expert in the field of trauma, grief and disasters. Professor Raphael is Chair of the National Mental Health Disaster Response Taskforce which coordinates mental health response to disasters and terrorism in Australia.

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The Severly Burned Patient: A Guide to Assessment, First Aid, Resuscitation, Surgical and Non-Surgical Wound Care

P Maitz

Burns are common injuries in civilian population (approximately 1% of the general population in Australia will sustain a burn injury every year) and are well recognised following military engagements. In recent years more comprehensive understanding of the patho-physiology of burn injuries has led to great advances in the treatment of these patients.

This presentation will give an overview of assessment, first aid and resuscitation of the burned patient. In addition recent advances in the area of wound care will be discussed as dressing materials like Acticoat have revolutionized our abilities to influence wound healing.

Up to date surgical approach to severe burns will be discussed including escharotomy, fasciotomy, surgical planning for early debridement and skin grafting. Advanced intensive care with elective intubation have enabled us to stabilize even the most severe cases of burn injuries, which lead to the need for temporary alternate wound coverage after large initial wound debridement. Bioengineered materials available today will be discussed and their benefits and limitations explained.

Finally a short explanation about the role of tissue culturing in the treatment of severe burns will highlight the current possible treatments and the advances expected in the near future.

Dr Maitz is currently the Medical Director of the Burns Unit at the Concord Hospital, University of Sydney. He was previously a specialist plastic and reconstructive surgeon at the University of Vienna, Austria. His research experience extends to being a Microsurgical Research Fellow at Harvard Medical School, Division of Plastic Surgery, Boston, USA where he specialised in burn reconstruction and to being a Research Fellow at MIT, Division of Health Science and Technology, Biomedical Engineering, Cambridge USA. Dr Maitz has numerous publications to his name in the British Journal of Plastic Surgery journal, Microsurgery journal, Burns journal, the Journal of Plastic and Reconstructive Surgery, and the ANZ Journal of Surgery. Dr Maitz received the Order of Australia for his services to Australia following the Bali bombings.

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Leadership and Lobbying

W Glasson

Dwight Eisenhower is attributed with the quote, "Leadership is the art of getting someone to do something you want done because he wants to do it. George S Patton is attributed with the quote, "Don't tell people how to do things, tell them what to do and let them surprise you with their results." Theodore Roosevelt is attributed with the quote,

“The best executive is the one who has sense enough to pick up good men to do what he wants done, and self restraint to keep from meddling with them while they do it. And the final quote, Groucho Marx is attributed with the quote, “Only one man in a thousand is a leader of men. The other 999 follow women.”

There is no correct leader nor is there a correct style of leadership, as there are infinite numbers of leaders and styles of leadership. The key to successful leadership is to keep your eye on the main game and not allow yourself to be intimidated in what is a volatile and at time, threatening, environment. Leadership is much easier when you have a team that keeps the ideas, the policies and the opportunities coming. Good leadership is the ability to have clear objectives with issues driven by passion and compassion, being well prepared with the facts, and to have views and information which reflect community needs and are acceptable within the broader community.

Lobbying is about getting your message to the people who make the decisions. Politicians and the bureaucracy are often desperate to get the correct information to allow them to make a balanced and fair decision. By lobbying politicians and the bureaucracy, the view of your organisation or the people who you serve will be fairly heard and fairly judged. Lobbying is about face to face contact, but is also about using your brain, using established local networks, using the power of written information in the form of letters to politicians and bureaucrats and also the important use of the media. Politicians respond to their constituents. Constituents often respond to the message they are receiving through the media. It is the use of the media which can often be one of your most powerful lobbying tools.

Good leadership and strong advocacy position your organisation in a proactive rather than reactive setting.

Dr Bill Glasson was elected Federal President of the Australian Medical Association in May 2003, and was re-elected to a second term in May 2004. Bill has been actively involved in the AMA and his professional College throughout his years of practice, holding several positions with these organisations including President of the Australian Medical Association, Queensland for 2000-2001.

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US Military Medical Response to Recent Natural Disasters and the Need for Rapid Response Medical Teams

T Burkhard*, P Breed

During this past years BALIKATAN Exercise, which included the real-world response to the mudslide in Leyte, Philippines, DoD medical personnel provided care to >11K patients. During the disaster response to the recent Yogyakarta, Indonesia, DoD medics provided care for more than 2000 patients. While both these support missions were a success, they demonstrated the need for rapid response medical teams for this type of event.

A new medical concept of operations (CONOPS) is being

examined that would establish “standing” medical rapid response teams and streamline the deployment process. These teams would be manned with physicians and medical technicians, be “on-call” on a rotational schedule, be equipped with life savings supplies typically needed during natural disasters and perhaps most importantly have transportation assets “earmarked” to move these teams. While highly capable, lightweight medical teams currently exist within the DoD, these teams are not defined as rapid response teams, nor are they linked to transportation assets. These current limitations often results in significant delays in getting teams into the “battle flow” and on-site to administer care.

When fully developed, this CONOPs will establish medical rapid response teams for HA/DR missions that can be on the ground providing care in a matter of hours not days. This ability to get to patients rapidly could not only save countless lives, but keep our medical teams actively engaged in trauma medicine that may someday be needed on the battlefield.

Rear Admiral Thomas Burkhard is the United States Pacific Command Surgeon. He entered the United States Navy as a line officer in 1969 and after four years attended medical school. RADM Burkard is a licensed radiologist and has served the medical community in a variety of positions, including as Commander of Portsmouth Naval Hospital, the largest medical facility in the US Navy. As the PACOM Surgeon, he establishes policy and overseas US military medical operations within the Pacific region.

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Planning to Deliver Operational Medical Support in the Future – The UK Approach

M Von Bertele

A changing strategic environment and threat has made it necessary to reconsider how military operations might be supported in the future. Forces have to be available at short notice to deliver small packages of capability in the core regions, and may have to deliver enduring support for several years, remote from referral facilities. At the same time the UK Defence Medical Service has closed all of its military hospitals, and clinical personnel are being trained, and are working full time, in National Health Service hospitals. The challenge of identifying what type capability is required, of quantifying how much, of preparing the people, and maintaining them at readiness, and of delivering them to support operations, has been addressed through operational analysis of a range of possible scenarios. The same techniques have also been applied to forecasting the requirement for medical equipment, logistic support and sustainability, allowing transformation of the Joint Supply Chain (Medical) and delivering savings. This has been achieved while the UK maintains support to troops in Iraq, and while it has mounted operations in Afghanistan.

Brigadier Michael von Bertele is a Consultant Occupational Physician with a background in Aviation

Medicine, and operational experience in Northern Ireland, the Falklands, the Balkans and the Gulf. In his current appointment he is responsible for strategic policy on all issues relating to medical operational capability, including force health protection (CBRN), in the UK Ministry of Defence. He chairs the NATO General Medical Working Group and the NBC Medical Working Group.

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The Problem that is too often Ignored: The Prevalence of Mental Health Disorders in Military Personnel

A McFarlane

The military have often proved to be innovators in the development of mental health services. However the current operational tempo and emerging knowledge present major challenges to the delivery of services in the ADF. In the past decade, a number of epidemiological studies have highlighted the prevalence of psychiatric disorders in military populations. These data will be presented, demonstrating that there is a base line prevalence of approximately 10% of current disorder, even in cohorts that have not been on warlike deployments. In combat veterans, the rates are significantly higher, increasing the importance of recognition and intervention. From an operational perspective, the diagnosis and treatment of these conditions is a critical priority because of subtle impact of these disorders on the information processing at a neurocognitive level. This body of knowledge has not yet been adequately addressed as an imperative in understanding human factors errors in military settings.

There is much to be gained from an individual and organizational perspective from the ensuring that effective treatments are instituted early in the course of a disorder. At present, the stigma of psychiatric disorders, the propensity to normalised emerging clinically significant symptoms, the limited capacity to maintain individuals in active service roles if they are diagnosed, the MEC restrictions on deploying while on medication all conspire to prevent individuals seeking care. The need for a broad preventative approach which addresses issue of screening, effective administrative management and an integrate approach between psychological and medical services will be discussed. The Deployed Health Surveillance Program and Mental Health Prevalence Study are important initiatives that will explore the inseparable relationship of physical and psychological health and inform future service development in the ADF.

Professor McFarlane is currently the Head of the University of Adelaide Node of the Centre of Military and Veterans Health. He is an international expert in the field of the impact of disasters and post traumatic stress disorder. He is a Past President of both the International Society for Traumatic Stress Studies and the Australasian Society for Traumatic Stress Studies. He is the recipient for the Robert Laufer Award for outstanding scientific achievement in the study of the effects of traumatic stress He is currently the Senior Adviser in Psychiatry to the Australian Defence Force and the Australian Centre for Posttraumatic Mental Health.

He holds the rank of Group Captain in the RAAR specialist reserve. He has acted as an advisor to many groups in post disaster situations, including the Kuwait Government, and the United Nations. He has lectured and run workshops in Europe, United States of America, Asia and South Africa. Apart from his interest in post traumatic stress disorder in relation to disaster victims, military personnel and other civilian accidents, he has broadened the relevance of this knowledge to the area of those suffering severe mental illness. His research has focused on the epidemiology and longitudinal course of PTSD as well as the neuroimaging of the cognitive deficits in this disorder. He has published over 200 articles and chapters in various refereed journals and has co-edited three books. He is a member of several international advisory boards in the field of traumatic stress. He has also been involved in medico legal cases in a number of jurisdictions on matters relating to traumatic stress. He frequently appears in the media as a commentator on the impact of war and disaster.

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Resilience and Job Adjustment in RAAF ATC Officer Employment: An Exploratory Study

SJ Elliott

Military employment involves a range of stresses that may affect the job performance and retention of personnel, depending on their level of resilience. These stresses may be especially pronounced in demanding occupations such as air traffic control, whose members are required to manage demanding cognitive tasks in an environment where there is very low tolerance for under-performance, in a somewhat competitive work culture. Psychological variables, including self-efficacy, job commitment, social support and personality characteristics, such as optimism and emotional stability, have been related to resilience in other contexts. This study examines whether these variables are related to job performance and retention of Royal Australian Air Force (RAAF) Air Traffic Control (ATC) Officers, which are critical outcomes of resilience for the Australian Defence Force (ADF).

This paper briefly describes the relationships between the resilience predictors and outcomes outlined above in a sample of 203 RAAF ATC Officers, who were surveyed in either 1995 or 1998. These relationships are contrasted for ATC officers who are fully qualified, having achieved Radar Approach control ratings, and those who are yet to achieve full proficiency. Implications for the management of RAAF ATC Officers and for enhancing resilience in the ADF are tentatively discussed, along with possible future research directions.

Steve Elliott is a civilian member of the Defence Force Psychology Organisation's Psychology Support Group. He has worked with the Defence Department since 1980 in a range of psychology roles, including Air Force personnel selection research and student counselling at the Australian Defence Force Academy. Steve has been employed in his current role as an aviation training psychologist at RAAF Base East Sale,

where the RAAF School of Air Traffic Control is located, for over 10 years. He is married with three active sons, and he is presently struggling to find time to complete his Masters' thesis about job adjustment factors for RAAF ATC Officers.

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The Effects of Hypobaric Hypoxia on Pure Tone Audiometric Thresholds

K Datta

Various processes are involved in maintaining structural integrity and electrochemical Gradients essential to keep the sensitivity of the human auditory system intact. Many of these processes are energy dependent and may be affected by hypoxia. Method: The study was conducted on 22 males in age group of 20 – 32 years when they were being inducted to high altitude by air. A detailed examination including complete ENT examination with Pure Tone Audiometry (PTA) and SaO₂ by pulse-oximetry was done at sea level from where they were inducted to 3400m. In one group of subjects reading were then repeated at 1h, 3h, 12h, 48h, and 7 days and in the second group reading were repeated at 2h, 4h, 12h, 48h and 7 days from the time of arrival at 3400m. The subject after 7 days of acclimatization at 3400m was taken by road to 4725m. Here the subjects of group 1 were studied at 1h and 3h and group 2 at 2h and 4h on arrival to higher altitudes. Results: Non parametric test using Nemenyi test was performed and Q value of sea level versus 10 K, 8K and 6K were 5.23, 5.21, 4.77 at 1 hour and 3.59, 4.82 and 4.69 after 2 hour at 3400m where Q o.o01.df5 is 3.891. There was complete recovery after 7 days. There was no significant deterioration at 1h and 2h in group 1 and group 2 respectively at 4725m. The averaged SaO₂ at 1h 2h at 3400m were 89%, 88.8%, at 4725m were 84%, 84.2% in group 1 and group 2 respectively. Conclusion: There is significant deterioration of PTA thresholds on acute exposure to hypobaric hypoxia. A further exposure to a higher altitude after acclimatization shows a lesser drop in pure tone thresholds despite mean SaO₂ concentration being lower. This highlights the important role played by acclimatization.

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The Australian Defence Force Deployed Health Surveillance Program at the Centre for Military and Veterans' Health

S Kitchener

The Deployed Health Surveillance Program at the Centre for Military and Veterans' Health began in 2004. It now includes four major projects involving University of Adelaide and University of Queensland nodes of the CMVH. The program has opened opportunities to link Defence-owned routinely gathered health information and occupational-environmental hazard reports with self-reported information from veterans, and information contained in civilian registries regarding veterans and Defence personnel. The promise of

this epidemiological opportunity has now been tempered by the reality of significant limitations.

The linkage of a group of East Timor veterans to the National Death Index produced only two matches from 4124 records submitted however, 32 deaths were expected based on data from the Australian Bureau of Statistics. Linkage of the veterans to archived routine health assessments produced documents for 95% of subjects. A self-reported mailed questionnaire produced only a 14% response rate, with the limitations of a single mail-out, no reimbursements, no supportive letters and no media support. Addresses were confirmed as incorrect for 32% of subjects.

We have successfully identified many strengths and limitations of accessing civilian registries, Defence-owned and self-reported data on recent veterans. The information is being used to design subsequent studies of Solomon Islands, Bougainville and East Timor veterans.

LTCOL Scott Kitchener is a Reserve Consultant in Tropical Medicine and Clinical Research. He holds a position as Associate Professor at the Centre for Military and Veterans Health in addition to Principal Research Fellow at the James Cook University School of Tropical Medicine and Public Health. His civilian work includes research and post-graduate teaching at University of Queensland, research at the Wesley Research Institute and private practice as a Public Health Physician. He has been a member of AMMA since inception, recently being elected to the Executive.

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Age Estimation at Time of Death

M Blenkin, W Evans

In recent years the majority of forensic investigations into the deaths of serving Australian Defence personnel have been DVI operations - it's the nature of the beast. In all such cases the Defence Force has not been the lead agency, but instead has provided professional expertise to assist the Agency running the show. It is this assistance to Civil Authorities that is a major role of the Australian Defence Forces forensic specialists, but it is not just limited to the investigation of fatalities of Defence Force personnel. For example, in recent years we have assisted with the DVI operations of the 1st Bali bombings and last years Lockhart river air disaster. It is because of this wide scope of employment, that our expertise does not have to be limited to the age bracket our fighting soldiers, sailors and airmen - which is where this research project fits in. It is in providing Defence Aid to the Civil Community that the age bounds of our knowledge and expertise may be tested. With this scope of employment in mind, this project sought to find a more accurate way to estimate the age at time of death of children.

The estimation of age at time of death is often an important step in the identification of human remains. If this age can be accurately estimated, it will significantly narrow the field of possible identities that will have to be compared to the remains in order to establish a positive identification. Some of the more accurate methods of age estimation, in the juvenile and younger adult, have been based on the assessment

of the degree of dental development as it relates to chronological age. The purpose of this current study was to test the applicability of one such system, the Demirjian system, to a Sydney sample population, and to develop and test age prediction models using a large sample of Sydney children (1624 girls, 1637 boys). The use of the Demirjian standards resulted in consistent overestimates of chronological age in children under the age of 14 years by as much as a mean of 0.97 years, and underestimates of chronological age in children over 14 years by as much as a mean of 2.18 years in 16 year-old females. Of the alternative predictive models derived from the Sydney sample, those that provided the most accurate age estimates are applicable for the age ranges 2-14 years, with a coefficient of determination value of $R^2=0.94$ and a 95% confidence interval of ± 1.8 years. The Sydney based standards provided significantly different and more accurate estimates of age for that sample when compared to the published standards of Demirjian.

CMDR Matt Blenkin has served 18 years in the Royal Australian Navy, about 4 of which have been at sea as a Ships Dentist. He undertook a MSc in Forensic Odontology at the University of Sydney in 99-2000. Since that time he has been involved in the forensic investigation of fatalities for State Coroners, the military, and the Australian Government both domestically and internationally. He is currently 'Staff Officer - Projects' in the Defence Health services Division in Canberra.

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Heal Thy Self? - The Personal Mental Health Challenges Faced by Military Health Professionals

M Suen*, SE Hodson, N Bennett

Australian military health professionals have a proud operational deployment history. They have saved and enhanced the lives of not only military personnel but civilian in war torn countries and disaster situations. However, what are the costs of this service? Are there specific psychological challenges for military health professionals in the modern battle-space and operational environments? What can be done to ensure operational deployments result in enhanced resilience?

This paper will utilise research data from a number of ADF deployments to highlight the psychological challenges for military health professionals. It will explore the theoretical constructs that assist us to understand these challenges and will consider strategies for enhance post-deployment growth and resilience.

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The Characterisation and Referral of Severe Trauma in North Queensland. Implications for Military Medical Units Operating in Isolated Areas

A McDonnell*, P Aitken, M Elcock, C Vietch

Introduction: Trauma is the leading cause of death for all people aged between one and 34 years and the leading cause of disability for all people aged less than 65 years. It is a major cause of disability and death in military, rural and remote settings, with the death rate increasing with increasing remoteness. Patients in remote locations have difficulties accessing care and it is postulated that this difficulty with access compromises patient outcome. Australian Defence Force (ADF) medical units frequently deliver health care in isolated areas and refer trauma to civilian health facilities

Methods: Retrospective observational case series of trauma patients referred to The Townsville Hospital (TTH) from January to December 2004 (pre-intervention) and following the introduction of the Early Notification of Trauma Guidelines (ENofTG) into nine rural health facilities, a prospective series from February to June 2005. Inclusion criteria were Injury Severity Score (ISS) >15; in-hospital death; or mechanical ventilation for more than 24 hours. Outcome measures were expressed as time interval to referral, prehospital and retrieval/referral time intervals, and cause and nature of injury.

Results: One hundred and four patients experiencing severe trauma were transferred to TTH during 2004. Fifty per cent of transfers were from the three base hospitals in the North Queensland Health Zone. Twenty-eight per cent were from rural health facilities without 24-hour surgical cover and 22% were conveyed directly to TTH from the site of trauma. Transportation by air was the mode of transport for 77% of patients.

Road trauma (n = 43; 41%), falls (n = 24; 23%) and interpersonal violence (n = 23; 22%) were the most common mechanisms of injury, and injuries to the head and neck were the primary diagnosis in 71 per cent of cases. Males in the 15 to 29 year age group were significantly over-represented in the referral data (P = 0.0001). Correlations between Injury Severity Score (ISS) and radial distance to Townsville and ARIA score were significant at the P = 0.05 and P = 0.01 levels respectively. Median time to tertiary care was 8.0 (range: 2.5 – 58.4) hours.

Discussion: Before the introduction of the ENofTG, 29 patients were transported from rural health facilities and seven patients were transported in the same set of rural facilities after their introduction. The median time to referral before the introduction of the ENofTG was 30.0 (range: 1 – 122) minutes and 26 (range: 10 - 175) minutes (P = 0.931) after their introduction.

Conclusion: The time interval between injury and definitive care was long in this study and further research directed at finding strategies that can reduce this interval are urgently needed. A trend towards reduced referral times

his time as a clinical dentist and clinical manager at Air Force bases around the country. He has a strong interest in the use of information systems and statistical methods as an aid to the strategic and operational management of healthcare systems.

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Mental and Spiritual Wellbeing of Chaplains in the ADF

A Phelps

An investigation into the well-being of chaplains in the ADF was undertaken by ACPMH in collaboration with DMH and PCC-E. The investigation proceeded in three stages: first, a review of the literature on the potential impact of working in the caring professions in general and the clergy specifically, was undertaken, with risk, protective and early intervention factors identified; secondly, a series of focus groups attended by a representative sample of ADF chaplains were conducted in Sydney, Brisbane and Townsville, to identify sources of stress and coping for chaplains and their views on training and support activities; thirdly, a survey was developed and administered to all ADF chaplains. In addition to surveying sources of stress in their role, coping strategies and training/support activities, the inclusion of the World Health Organisation 5 item wellbeing scale (WHO-5) in the survey allowed a “snapshot” of chaplains’ current wellbeing to be taken. This paper will present the key findings.

Andrea Phelps is a clinical psychologist with 20 years experience in mental health, specialising in the area of posttraumatic mental health for the past 10 years. Since 2003 Andrea has worked as a clinical specialist at the Australian Centre for Posttraumatic Mental Health. In this role Andrea contributes to a range of policy and program development projects that assist organizations (in particular, DVA and the ADF) and health professionals in the recognition and care of people who develop trauma-related mental health problems.

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Hurricane Katrina – A personal survivors viewpoint

RF Curtis

Introduction – Hurricane Katrina devastated New Orleans and the Gulf Coast in late August 2005. Whilst much is made of the whole of government failures in the disaster response some authorities and organisations performed well at the micro level. This presentation looks at the actions and reactions of the local populace and one organisation, the Hilton Hotel Riverside during and in the immediate aftermath of the hurricane.

Methods – The author was in New Orleans for an Emergency Medical Services conference at the now infamous New Orleans Convention Center, 25-27 August 2005, immediately prior to the landfall of Hurricane Katrina. As one major consequence of the lack of public transport coordination prior to the hurricane’s landfall, he and 700 other patrons were trapped in the Hilton Hotel Riverside until evacuated under armed National Guard escort on the morning of 3 Sep 2005.

Results – This presentation highlights the environmental and structural changes and reactions to the hurricane’s dramatic impact upon New Orleans and the valiant and sometimes exceptional attempts, including failures, made by individuals, including hotel staff to alleviate the distress of locals and hotel patrons who were effectively blockaded in the immediate environs of the hotel for 96hrs.

Discussion – Over 700 people were crammed into the Hilton Hotel Riverside and immediate area for over four days. Whilst these people did not have to endure the ‘living hell’ that became apparent in the Superdome or in the New Orleans Convention Center (only 100m away) the cramped surroundings, severely degraded environmental conditions, personal perceptions and mixed socio-economic demographic seriously tried the logistic, organisational and hygiene standards and procedures of the hotel and its staff. Well founded concepts such as the ‘tribe mentality’ and Maslow’s theory of hierarchical needs were demonstrated during that 96hr period. Whilst most Hilton hotel staff performed exceptionally, there are management and leadership lessons that can still be learnt, both on a micro and a macro level. These lessons can easily be applied to current ADF operations and not only those with a solely humanitarian mission.

LCDR Bob Curtis is currently the e-Health Officer at Centre for Military & Veterans Health at University of Queensland. Between Jan 2004 and Feb 2006 he was an exchange officer with the USN heading the US Naval Telemedicine Business Office in Bethesda, MD. He holds a B.AppSc in Environmental & Occupational Health from UWS, Hawkesbury. He has had a long career in the RAN Medical Branch as a general medic, pathology technician and pre-hospital care technician dating back to 1979 and as a Medical Administration Officer for 12 years. He saw operational service in HMAS SYDNEY during the first Gulf War, but considers his recent tour of duty in the U.S. as the highlight of his career thus far.

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Provision of Quality Health Care to Defence Members – A Collaborative Model to Provide a Quality In-barracks and Deployable Health Capability

M Lakos

Delivery of health care in the ADF is currently a very fragmented process.

The combination of APS, Contractor and Military staff combined with a multitude of administrative chains leads to a very complicated model of health care delivery.

We will discuss the current processes involved in delivering health care, and the problems that have developed from these processes. These include staffing issues, equipment issues, facility issues and quality issues.

A collaborative model is proposed in which all the key stakeholders contribute in an effective way, to deliver quality in barracks and deployable health care.

We will discuss both the tangible and intangible benefits of this collaborative model and its ability to deliver quality health care.

Dr Lakos has worked for Defence Health for 2 years. He is currently the Director of Clinical Services at 1st Health Support Battalion, Holsworthy Barracks, Sydney.

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Preliminary Results of the Case Control Dental Study on Dental risk Factors and Unscheduled Dental Visits

GD Mahoney*, G Slade, S Kitchener

This study seeks to develop a Dental Fitness Classification scheme that accurately predicts risk of dental symptoms and other adverse dental events requiring unscheduled dental visits (UDVs) among Australian Defence Force (ADF) members. The Classification scheme will serve two complementary goals: firstly, identifying those members of Australian Defence Force who can be deployed with minimum risk of experiencing UDVs; and secondly, permitting ADF to target appropriate preventive and curative dental treatment towards those ADF members who cannot be deployed because they have a high risk of developing UDVs. These overall goals will be achieved through three specific aims:

1. Among a cohort of 1,200 ADF personnel, to retrospectively examine associations between fixed personal characteristics (eg. age, sex, rank, lifetime exposure to fluorides, parental dental history) and probability of an UDV in the year preceding enrolment into the study.
2. To prospectively calculate the risk of new UDVs developing among cohort members during the year following their enrolment into the study.
3. To develop a multivariate, ordinal logistic regression model that predicts probability of experiencing UDVs using factors identified in Aim 1 together with clinical findings observed at the time of study subjects' enrolment into the study.

This paper deals with the preliminary findings of the retrospective examination of the associations between fixed characteristics and the probability of an UDV (Aim1).

From the results of the data gathering we first analyzed bivariate associations between each putative risk factor and a binary variable indicating whether or not subjects had a UDV in the 12 months preceding enrolment into the study. Risk factors were categorized into two or more mutually exclusive groups that represent meaningfully different levels of risk. Cut-points for collapsing the data were based on precedence from previous studies, scientific rationale (e.g. to create groups that contrast meaningfully on clinical grounds) or data distribution (e.g. to avoid producing a category comprising fewer than 15% of subjects). Where more than two levels were created, we assigned the presumed lowest risk group as the referent and calculate odds ratios for UDV for each of the other groups (e.g., moderate risk, high risk) in relation to that referent. This step yielded crude (unadjusted) odds ratios as measures of association. We then selected variables that yield moderately significant associations, namely odds ratios that exceed 2.0 or for which 80% confidence intervals exclude the null value of 1.0. Those variables were then entered into a multivariate logistic regression and its goodness of fit will be assessed using three summary statistics: pseudo-R-squared for the model; area under the receiver operating characteristic (ROC) curve; and sum of sensitivity and specificity at the threshold of predicted probability that yields a predicted proportion of cases equivalent to observed probability of prior UDV in the cohort. Additional modeling eliminated variables from the model that individually have high P-values, reassessing goodness of fit until all remaining variables are statistically significant ($P < 0.05$).

Greg Mahoney is a conjoint senior lecturer at the Centre of Military and Veterans Health at the University of Queensland, where he is undertaking his PhD in dental risk in the military environment. In addition, Greg holds a number of positions with the Queensland Dental Board, Australian Dental Association, The Australian Society for Dental Anaesthesiology, and is the scientific coordinator of the IFDAS's World Conference on Dental Pain and Anxiety in 2009.

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Developing Innovative Models of Patient Care Delivery: Defining Success

M Chiarella

In 2004, the Nursing and Midwifery Office of NSW Health commenced a four- year project to review, develop and implement sustainable and innovative models of patient care delivery, under the leadership of Professor Mary Chiarella. Much needed increases in undergrads, TENs, ENs and new grads will mean significantly greater numbers of staff in the workplace, who in their early days will require education and support. The need for such a project was driven by a number of factors including: the increases in Nurse Practitioners and other specialist advanced practice roles that augured the introduction of greater numbers of highly specialised staff

across the workforce; changes to care delivery patterns – e.g. clinical streaming, outreach and in-reach programs that would mean geographical and structural shifts to the nature and location of teams; and the focus on the multidisciplinary workforce development that could mean changes to the allocation and ownership of work.

The Models of Care Project is an iterative process designed to be a forum for exploring ideas and generating discussion, to provide clinical and academic nurses with opportunities to think about analysing practice, and to direct clinicians and academics towards a range of tools to help them to evaluate the effectiveness of existing practices. A number of themes emerged from the first year's work which included: Reflective practice, analysis of practice, measurement and evaluation of patient- and staff-centered outcomes, adaptations of innovations, changes in skill mix, changes in care delivery practices and changes in rostering.

The second year of the project has built upon the themes of the first year to stimulate wider debate and discussion. A number of interesting issues have arisen that will form the focus of this presentation relating to how success is defined in clinical practice and how sustainability and spread of a project such as this might be achieved.

Mary Chiarella is a respected nurse, midwife, author and academic. She has worked as the Chief Nurse for NSW where she was responsible for a workforce of over 45,000 nurses in NSW, providing clinical and planning advice to the Minister for Health. She was a founding member of the Australian Bioethics Association and the Australian Institute for Health, Law and Ethics. She helped establish the world's first Doctor of Midwifery course at the University of Technology, Sydney (UTS), was the Foundation Professor of Nursing in Corrections Health, NSW and has been a key player in a host of nursing, education and health planning committees. She holds qualifications in nursing, education and law. She has lectured and published extensively both nationally and internationally. Currently she works as the Professor of Clinical Practice Development and Policy Research at the University of Technology, Sydney, a personal Chair funded by NSW Health.

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Deployment Health Research – Where to Next

M Sim

Post-deployment health effects in veterans who served in the 1990-91 Persian Gulf War have been the most extensively studied of any veteran group. The main findings from this body of research conducted in several different countries, including Australia, is that psychological disorders and self-reported symptom reporting (with no unique patterns) are higher than expected, but there has been no increase in mortality nor in other objective adverse physical health outcomes. The cause of increased symptom reporting in Gulf War veterans remains uncertain, with theories including psychosocial, immunisation and toxic factors, and given the increasing time since the Gulf War, we will probably be

limited in our ability to investigate such causes further in these veterans.

So what have we learnt out of the large international research effort into the health of Gulf War veterans and what are the implications for future research into the post-deployment health of veterans of current and future conflicts? Investigating the causes of ill-health in veterans has been the main research focus in the past and while this will continue to be an important area of deployment health research, there should be an increasing focus on earlier detection of health problems and investigation of ways to reduce their impact. A recent study on USA veterans returning from the current Iraq War has shown that mental health problems are still common in these more recent veterans, with more than 35% accessing mental health services in the year after returning home. This study also showed that post-deployment psychological screening was of limited utility in predicting mental health problems, as less than 10% of those veterans who received mental health treatment were referred through the screening program. These findings have important implications for maintaining a strong force capability and combat readiness among deployed troops.

The other major consideration for future deployment health studies is the research methodologies to be used. Much of the previous research has used cross-sectional studies and self-report of health indicators and deployment exposures. Such weak methods limit our ability to make definitive conclusions about the findings from these studies. Future studies will need to use stronger study designs, such as longitudinal studies, include more objective measures of health status, make better use of routine health data collected during military service and undertake more extensive linkage to health registry and health service use data. Another major research area in urgent need of methodological development is exposure assessment relating to environmental and psychological stressors during deployment. With the likelihood of many ADF personnel having more than one deployment, there is also a need to take a more global approach to future deployment health research, rather than studying each deployment separately. Such a global approach has been pioneered in the USA, with the establishment of the Millennium Cohort Study, which is a prospective study involving more than 100,000 US service personnel, which provides important surveillance data and the ability to study the impact of a wide range of deployment and other military service factors on the health of military personnel.

Professor Malcolm Sim is an Occupational Physician who is Director of the Monash University Centre for Occupational and Environmental Health (MonCOEH). His main research interests include the human health effects of occupational and environmental chemical and other exposures, occupational disease surveillance, veterans' health and exposure assessment in epidemiological studies. He has published over 120 journal articles and research reports related to his research and his veteran health research group was awarded the Victorian Public Health Research Excellence Award in 2005 for the Australian Gulf War Veterans' Health Study.

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Application of Models of Occupational Stress Used In Industry to Defence

N Ellis

There is growing recognition in Occupational Health and Safety (OHS) authorities and industry, less so in Australia, more so in Europe, especially the UK, that occupational stress is a leading cause of illhealth and low productivity. In the UK community-based surveys of self-reported work-related illhealth show that mental health problems arising from occupational stress are the top cause of absenteeism, for example.

In 2005 the Health and Safety Executive issued the first stress management standards in the world. The standards are evidence-based and provide a description of the most important occupational stressors and the means of measuring them in workplaces.

From a mental health perspective, the focus in the Australian Defence Force (ADF) to date has been on secondary prevention, treatment, and more recently tertiary prevention (rehabilitation). Where primary prevention has been considered the focus has been on individual level strategies, eg resilience, as opposed to organisational level strategies – way work is organised and the way people are managed.

This paper will present a review of the military medicine literature for work on models of occupational stress and quality of life in Defence, as well any work on interventions which work at an organisational level, and which include improving health and well-being as an aim.

In the light of this consideration will be given to the applicability of the UK HSE stress management standards to the ADF.

Niki Ellis is the Director of the Centre for Military and Veterans' Health (CMVH). The Centre is an innovative, multi-discipline centre, focusing specifically on the health of Australian Defence Force members during and after their service. Niki came back from London to Australia to take up this position in April 2005. As well as managing the networked organisation which is the Centre, quite a task given it comprises three universities, relates to two major funding departments and is keen to work in collaboration with five other Defence centres; she runs her own research programs through the Director's research initiative. Her research interests include occupational stress, the contribution of psycho-social factors to physical health outcomes and improving role design in health services.

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Somewhere Only We Know

D Collins

This paper will deal with the experience of the 2nd ADF Medical Detachment deployment to Iraq in 2005. It with the challenges in the shape clinical, ethical and military matters that the rotation experienced. It will also discuss a number of relevant lessons learned from the deployment.

Lieutenant Colonel David Collins RFD David is currently the Head of Corps of the Royal Australian Nursing Corps and Staff Officer Projects (Nursing) at Defence Health Service Division. He is also the chair of the Australian Defence Force (ADF) Nursing Consultative Group.

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Enhanced Strategic AME: Deployable Aeromedical Transport and Retrieval System D.A.R.T.S

AP Pearce*, C Daniel

The safe and timely transport of injured members of the ADF has evolved from the days of strapping patients to stretchers on the floor of a DAK.

We have now moved to provide the level of care used in the civilian medical retrieval arena to the difficult and demanding conditions of the ADF in the Hercules C-130.

The need for power, suction, restraint and certification of equipment and ease of transport of medical equipment in flight has led to the design, testing and release of the Deployable Aeromedical Transport and Retrieval System (DARTS).

DARTS is a significant step forward in how we manage our patients whether it be in response to a regional disaster or an AME from the various areas of operation that we are currently involved.

The presentation will outline the evolution and introduction into service, including operations, of the DARTS and how the process should relate to other AME medical equipment being considered by the ADF.

The DARTS system consists of a number of components that form a unit to provide intensive care facilities for a seriously ill patient in the strategic AME environment.

The process starts with the patient on a NATO or wide litter with a bridge over the litter on which the module which has a vital signs monitor, portable ventilator, and 2 infusor pumps sits. Once the patient is moved from the medical facility either by ambulance or carried to the C-130 the module is lifted off the bridge onto the docking station already assembled in the aircraft. The docking station has power from the inverter giving 240 V AC and 28 V DC as well as lighting from two wander lights, oxygen via the oxygen bottle cage restraint system which can mount two E or D cylinders.

Once the module is on the docking station the bridge is stowed for flight and the process repeated at the receiving end.

This system has now been tested in flight and used on AME missions within Australia as well as overseas on operation on both the C-130 J and H model.

With the acquisition of C17 airframes in the near future the adaptability of DARTS on other airframes will also be considered. The DARTS will form part of our enhanced AME capability along with AME and MCAT specialist teams.

The DARTS is a major step in providing critical care treatment on the ground and in the air for strategic AME. The issues of equipment restraint, ease of access, power, oxygen, suction have been addressed and improved.

Hopefully we do not need to use the DARTS in anger but now we have the capability and it certainly has revolutionised and improved how we do our work.

Dr Andrew Pearce is an Emergency medicine consultant with special interests and appointments in Trauma/Retrieval and Disaster medicine at the Royal Adelaide Hospital. Currently a RAAF Wing Commander specialist reservist with several overseas tours of duty and chair of the Emergency Medicine Consultative Group to the Australian Defence Force. Andrew recently returned from East Timor with the RAAF and was a member of team Echo the South Australian field medical team deployed to Banda Aceh after the Boxing Day tsunami. He is currently the Vice President of the Australasian Trauma Society and Chair of ACEM Trauma sub-committee. Andrew is actively involved in teaching at all levels and his interests outside work centre on Annette, their son Matthew, good wine, good friends and flying.

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Should Eskimos Jump? Spondylolysis, Spondylolisthesis and the Military Parachutist

JE Cunningham*, E Hartley, AM Ellis

Military parachutists represent a unique form of soldier. They are required to be able to land at a high descent rate onto hard ground, placing enormous amounts of compressive and torsional forces through their spines. Whilst transient episodes of back pain in these soldiers is not uncommon, it is important for the soldier, the unit and the Australian Defence Force (ADF) to be able to establish which soldiers may have conditions which may preclude them from jumping.

Spondylolisthesis is a well recognised cause of pain and spinal canal stenosis. It is a condition where one vertebral body shifts anteriorly over the vertebral body inferior to it. It is most commonly found at the L5-S1 articulation, although it can also occur at L4-L5. The most common form is isthmic spondylolisthesis which is caused by spondylolysis, a defect of the pars interarticularis of the lumbar vertebrae, and is a developmental defect. The pars may also be elongated, resulting in the same "slip". Most are metabolically quiescent by the time the person reaches adolescence. The other common type is degenerative spondylolisthesis, which is caused by degeneration of the facet joints and intervertebral disc.

In this paper, the importance of spondylolisthesis in the military parachutist is discussed. The pathogenesis, natural history and complications of the condition are examined, and a literature review of the condition is presented, concentrating on the particular requirements of the military parachutist and

the ADF. The scenarios in which spondylolisthesis may present itself are also discussed, and recommendations are made with regard to the management of military parachutists who present with spondylolisthesis.

Major John Cunningham is currently posted to the 1st Health Support Battalion. He has had operational experience in East Timor, Bougainville and the Solomon Islands and has been part of the creation of the Chemical, Biological and Radiological Response Squadron of the Joint Incident Response Unit for the Olympic Games. He is an advanced trainee in Orthopaedic Surgery and is presently practicing at Wagga Wagga Base Hospital.

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Review of ADF Injury Data for Infantry and Airfield Defence Guards: 1998-2003

J Harvey

Introduction: The Defence Physical Employment Standards Project (DPESP) is aimed at developing performance-based physical employment standards for sections of the Australian Defence Force (ADF); specifically, for Infantry and Airfield Defence Guards (ADG). One component of this work was to investigate patterns of injury experience within the ADF, with particular reference to relationships between injury occurrence and the performance of particular combat arms trade tasks (CATTs). This involved a review of the three relevant occupational health and safety (OHS) databases: the Defcare database maintained by the Occupational Health Safety and Compensation Branch (OHSCB); and two Defence Health Service Branch (DHSB) databases: Epitrack and the Defence Injury Prevention Program (DIPP) database. Defcare provided comprehensive data for six-year period 1998-2003; Epitrack and DIPP provided several selective snapshots within the same time period.

Methods: *Defcare.* Data records covering all reported incidents involving Army and ADG personnel were progressively filtered by a sequence of inclusion and exclusion criteria to produce a three-level hierarchy of injuries: 1. All Infantry and ADG injuries; 2. Work-related injuries; and 3. Injuries related to the performance of CATTs. Each set of injuries was then broken down by characteristics of the incident (e.g. year, activity), the person (e.g. rank, age, unit, occupation) and the injury (e.g. bodily location, mechanism, nature, severity) to produce a set of profiles. Estimates of unit populations were used to calculate injury incident reporting rates by unit by year. *Epitrack.* Compared to Defcare, this database was limited in temporal and organisational scope, and also in the amount of detail about the characteristics of incidents and injuries. However, it was possible to calculate estimates of some injury rates for comparison with results from Defcare. *DIPP.* This database was also very limited in temporal and organisational scope, but rich in detail about each injury recorded. Again, it was possible to calculate estimates of some injury rates for comparison with results from Defcare and Epitrack.

Results: Estimated rates of reported injury (per thousand

persons per year) in regular Infantry units, based on broadly comparable contextual settings for the three databases, were 109 (Defcare) 1552 (Eptrack) and 1276 (DIPP). According to Defcare data, around one third of reported injuries fell into each of the CATT-related, other work-related and non work-related categories. Profiles of a number of injury/incident characteristics will be presented and discussed.

Discussion: The injury rates estimated from Eptrack and DIPP data are similar to the rate in a US Army battalion (1420 per thousand persons per year) reported by Knapik et al. (1993)*. These rates are more than 10 times the rate of reporting to Defcare. Shortcomings identified in the (then) existing Defcare system included problems with the reporting form and injury classification schemes which did not provide sufficiently detailed information to support injury prevention efforts.

* Knapik, J., Ang, P., Reynolds, K. and Jones, B. (1993). *Physical fitness, age, and injury incidence in infantry soldiers. Aviation, Space and Environmental Medicine* 35(6): 598-603

Dr Jack Harvey is a Senior Research Fellow in the School of Information Technology and Mathematical Sciences, and the School of Human Movement and Sport Sciences, at the University of Ballarat. He is a mathematical statistician with over 20 years experience in applied research in many contexts including human movement science, health sciences, occupational health & safety, and social and behavioural sciences. From 2003 to 2006, Dr Harvey was Technical Manager of the Defence Physical Employment Standards Project, in which the ADF employed the services of the University of Ballarat to develop competency-based physical employment tests and physical employment standards for combat arms trades within Infantry and Airfield Defence Guards. Dr Harvey also had professional roles in research design, data management and statistical analysis within the project.

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The Angels from Downunder, Reflections on the Third Medical Detachment in Balad

KJ Sullivan

The third rotation of the Australian Medical Detachment – Balad deployed in the latter part of 2005. The title of the paper is drawn from a description of the team given by a USAF sergeant. This paper reflects on the experience of the team, the challenges it faced and looks at lessons that can be learned.

Challenges

The team was thrust into a constantly high tempo, high patient acuity environment dealing with patients with multiple traumas. The physical and personal threat environment was difficult. In addition to the requirements to provide high quality health care the team had to adjust to cultural differences arising from working with a coalition partner and dealing with casualties from different ethnic, religious and cultural frameworks.

There were a number of ethical challenges that faced the

team. Compliance with the Laws of Armed Conflict and the provision of care to patients based on nothing other than clinical need changed the concept from the theoretical to the practical.

The physical environment changed with the hospital being rebuilt, whilst maintaining its ability to receive and treat casualties.

Lessons

There are a number of lessons. The value of ongoing research, reach back for specialist clinical support, the use of sophisticated evacuation assets and the dilemmas with treating the civilian population provide a number of factors that should be considered by health staff when planning support to an operation. The experience also provided confirmation that the individual training of ADF health personnel is first class.

Major Kim Sullivan is the SO2 Clinical Services at Land Headquarters. He deployed in September 2005 as the Officer Commanding the Australian Medical Detachment. Major Sullivan has extensive experience in Army's Health Services with operational deployments in Bougainville and East Timor.

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RNZAF Aeromedical Evacuation ... The Challenge

JA Telford

Regardless of the extent of ones resources, we must strive to achieve the best, to be the best. This is the RNZAF Aeromedical challenge. No matter where our troops are we need to provide them with the best possible health capability we can.

From a capability that was nearly non existent and a history of limited sustainment, the RNZAF medical trade is now moving forward to provide the best Aeromedical Evacuation (AE) capability in the world.

This presentation will look at the challenges of achieving an internationally acceptable AE capability. From small beginnings to a vision of being the best, this project presents many challenges. The lessons learnt are to be shared and include the:

- a. need to engage tri-service support early
- b. importance of hierarchy buy-in
- c. ability to communicate with our ABCA counties especially our closest ally
- d. enlisting of our civilian AE providers

From a blank piece of paper through endless meetings, intense debate and countless lists, to the purchase of the first piece of equipment and the building of the prototype, this project shows the challenges we face as a small Military health capability. The expectations are huge, the job endless, but there in lies the challenge.

Squadron Leader Telford has worked in the Military environment for 21 years as a nurse, and instructor and a health planner. She has operated in a number of overseas postings. She transferred to the Airforce in December 2005 and now works as the Aeromedical Project Officer for the RNZAF.

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What is the Appropriate use of Antidepressants in the Australian military?

JA Ross, L Lambeth

The use of antidepressants of any type in military personnel has traditionally resulted in the individual being rendered unfit for deployment. If retained in uniform, they have not been considered fit for deployment again until stable off all psychotropic medication.

However, depression is an extremely common illness, with a lifetime prevalence of 20% in Australia, and with a burden of disease (as measured by quality adjusted life years lost) the highest of any disease.

The treatment of depression has changed significantly in recent times, with the recognition that it is a chronic disease, with relapses common. After the first episode, there is a 50% chance of relapse within 2 years. Thus, the trend is to have maintenance therapy with antidepressants after the second episode.

A ban on deployability with antidepressants will result in the loss of a significant proportion of the workforce in the ADF, and a driving underground of many depressed people. It is likely that many will either seek treatment outside of the military health system, or will not seek appropriate treatment.

There is growing evidence that antidepressants, if used as part of a suite of healthcare, once symptoms of depression have resolved, and where there is no evidence of self harm, psychosis or side effects from medication, are safe to use. As such antidepressants should be compatible with operational deployability.

This presentation will present the rationale for the use of antidepressants in operationally deployable uniformed personnel

Dr Lambeth is a psychiatrist who until recently has been in private practice in Newcastle, and a GPCAPT in the RAAF specialist reserve. He is now the Director of Mental Health in Defence Health Services Division. A/Prof James Ross is Director of Operational and Preventive Health in the Defence Health Services Division. He is an Occupational and Public Health Physician and with adjunct associate professorships with University of Queensland and University of South Australia

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Fantastic Voyage: Health Implications of Nanotechnology

RJ Stacy, N Abou-seif

In 1966, the concept of micro-machines supporting health activity was the science fiction of the time. The movie 'Fantastic Voyage' depicted the use of miniaturised submarine to conduct a life saving mission inside the human body at a cellular level.

2006 micro-machines have achieved scientific reality and are becoming commonplace in today's world. With this

expansion, industry is also seeing the application of nano-technology as a growing issue with occupational health, safety and environmental implications.

What are the implications for the ADF of today and tomorrow?

This paper explores:

1. The developing science of nanotechnology;
 - Nanotechnology defined.
 - The types and uses of 'nano-machines' described.
2. The benefits of Nano-technology;
 - Current uses.
 - Potential uses.
3. Emerging issues; and
 - occupational health related
 - safety related, and
 - environment related
4. Looking to the future.
 - Occupational issues
 - Potential abuses

LTCOL Stacy has worked within the areas of human factors and military medicine for over 32 years supporting large organisations, including Defence, Telstra, BHP and Melbourne Health.

He was the winner of the 2004 Eric Wigglesworth National OHS Education Medal, and is a Research Fellow of the University of Ballarat and a Fellow of the Safety Institute of Australia.

Bob has a Bachelor of Science in Physiology and Human Performance from the University of New England; a Master of Science in Ergonomics and Human Factors from the Loughborough University of Technology, in the UK; and a Doctorate from the University of Ballarat in OHS and organisational development.

Bob is currently working with CSR as their Group Manager Occupational Health and Safety.

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Combat Nursing in Afghanistan

D Dudley

The Australian Government in support of the reconstruction of Afghanistan recently deployed two Chinook Helicopters, Aircrew and support staff to Kandahar. As part of that deployment an AME team also deployed consisting of an MO, NO and Medical Assistant, though their role was unspecified and they did not do AME with the Australian Aviation Element they did however work with the Canadian led Role 3 in all areas and later with the American 159th Medical Company (Air Ambulance) conducting dedicated AME tasks. CAPT Dudley's presentation aims to give an overview of what the team actually did and how they did it. In total for their deployment the team worked for two months with the Role 3 with CAPT Dudley working in the General ward, ICU, Resuscitation and OT and two months with the 159th Medical Company (Air Ambulance) conducting both day and night combat casualty dust-off in secure and insecure LZ's, and casualty retrievals from FST's.

CAPT Dave Dudley enlisted into the ARA on the 19 November 1986. Following his time as an Environmental Health Technician and Medical Assistant he graduated from the University of Western Sydney in 2000 and was appointed an Officer in the RAANC. Since joining the RAANC CAPT Dudley has been posted to 1 HSB, 1 CSSB, 3 CSSB and LBMC. His career highlights have been establishing the MOA with the Townsville Hospital and working as the Training Officer at 3 CSSB. He has seen Operational service in Cambodia and the Solomon Islands as a Medical Assistant and in East Timor for two tours and Afghanistan as a Nursing Officer conducting both Nursing and AME roles.

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Prioritising the blast injured patient: penetrating, blunt and burn injuries- what goes first?

JV Rosenfeld

Australian Defence Force personnel served in the 332nd Expeditionary Medical Group US Airforce Hospital, Balad, Iraq 2004-2005 and gained much experience in managing mass casualty events and treating many bomb blast victims. There are many lessons to be learnt for Australian military and civilian health professionals resulting from this experience. This presentation will highlight the most important of these.

Bomb blast victims have combinations of penetrating, blunt and burn injuries. The more severely injured patients often arrive with hypotension, active haemorrhage, multiple extremity injuries, torso trauma, respiratory compromise, hypothermia, acidosis and traumatic brain injury. The 'ABCs' must be performed rapidly. Uncontrolled haemorrhage is a major cause of mortality in these patients. Tourniquets are useful for large extremity wounds with brisk haemorrhage. Whilst resuscitation and triage proceed on the multiple patients, priorities need to be determined for radiology, and theatre based on trauma surgeon triage and resources available. The injuries of the individual patient then need to be prioritised based on the urgency and predicted duration of the surgery and how this will affect overall theatre availability. Patients with head and neck trauma should have a CT prior to surgery if possible. Damage control surgery is an essential strategy for all specialties. The most urgent surgery is to stop haemorrhage, and to perform fasciotomy. There should be a low threshold for tracheostomy. Simultaneous surgery by multiple teams of surgeons is preferable when there are multiple life threatening injuries eg simultaneous craniotomy, laparotomy and vascular/orthopaedic limb repair. Vascular shunts are a valuable limb saving technique until vascular repair can be accomplished. Multiple returns to theatre will be required and must also be accommodated.

It is possible with good planning and a prepared hospital staff to restore order from the chaos of bomb blast mass casualties.

Colonel Jeffrey V Rosenfeld is Chair General Surgery Consultative Group, Defence Health Service, Adjunct Professor Centre for Military and Veterans' Health (CMVH) University of Queensland, Assistant Editor 'ADF Health' and

has deployed on multiple ADF operations. He is Professor and Head, Department of Surgery, Central and Eastern Clinical School, Monash University and Professor / Director of Neurosurgery at the Alfred Hospital.

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ADF Rehabilitation Program

J Porteus*, A Gill

The Australian Defence Force Rehabilitation Program (ADFRP) is much more than clinical treatment or health care of military personnel. It is an holistic assessment and management system that combines the elements of health care, occupational health and safety, and personnel capability management.

From a health care perspective, the Australian Defence Force (ADF) has a responsibility to provide Health Care to its members in order to maintain the required level of operational readiness. Rehabilitation is a key component for facilitating the return of members to a state of readiness as soon as is practicable after injury or illness.

The new program has also been developed to ensure Defence meets its duty of care to members and its responsibilities under the Commonwealth occupational health and safety legislation and the Military Rehabilitation and Compensation Act. As an occupational health and safety initiative, it seeks to reduce the impact of occupational injury, illness and disease, and to minimise the members' need for compensation.

Most importantly, the new program is workplace or occupational-based as this provides the most realistic environment to assess fitness for work. Through rehabilitation more members of the ADF will be employable and deployable, resulting in an increase in military capability. In addition, effective rehabilitation will reduce the number of medical discharges.

Jim is currently the Director of the newly formed ADF Rehabilitation Services section of the Defence Health Services Division. He is responsible for leading the implementation and ongoing delivery of coordinated rehabilitation services across the Australian Defence Force (ADF), the development of rehabilitation policy and strategies, and liaison with internal and external stakeholders.

Jim has 22 years experience leading teams in the development, implementation and evaluation of people strategies, policies and initiatives across Defence. He has represented Defence at Inter Departmental Committees (IDC), working groups and international conferences.

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Physiological Penalties of Prolonged Hypotensive resuscitation

SA Watts*, J Garner, C Parry, J Bird, E Kirkman

Currently there is a move away from normotensive (ATLS-style) fluid resuscitation of trauma casualties towards hypotensive strategies (NICE guidelines 2004). However, supporting evidence is restricted to penetrating injuries with short delays to definitive surgery. The objectives of this study

Prolonged hypotensive resuscitation is not compatible with survival after primary blast injury and leads to metabolic acidosis that is severely compounded by blast injury. The attending clinician will need to balance the risk of re-bleeding associated with normotensive resuscitation with the metabolic derangement associated with hypotensive resuscitation.

Dr Sarah Watts is a veterinary surgeon who has worked at Dstl for 6 years and has worked in the area of combat casualty care for 3 years. The current research areas include examination of resuscitation strategies following blast injury.

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Group (n)	Group 1 (8)	Group 2 (6)	Group 3 (8)	Group 4 (6)
Blast/sham	Sham	Blast	Sham	Blast
Resuscitation	Normotensive	Normotensive	Hypotensive	Hypotensive
No surviving to 8 h/ total	8/8	4/6	5/8	0/6
Mean survival time (95% CI) min	480 (all survived)	422 (313-531)	352 (210-494)	137 (94-181)
ABE ₁₈₀ mM (mean±SEM)	-6.7±3.8	-12.9±2.8	-14.4±2.1	-23.1±1.0
ABE ₄₈₀ mM (mean±SEM)	0.4±1.8	-5.4±2.2	-15.8±3.8	None surviving

were twofold: to compare normotensive vs hypotensive fluid resuscitation over a longer timescale and assess the effects of primary blast injury on this response since these may become an increasing problem in military and civilian mass-casualty settings.

A randomised prospective cohort study was conducted on splenectomised pigs (45-65 kg) terminally anaesthetised with alphadolone/alphaxolone. Animals were subjected to primary blast injury or sham blast. All animals received a controlled haemorrhage (30% estimated blood volume), 5 min shock period followed by intravenous infusion of 0.9% saline according to one of two protocols:

1. Normotensive (28.6 ml/kg at 3 ml/kg/min) plus further aliquots to maintain systolic blood pressure (SBP) at 110 mmHg or;
2. Hypotensive, no initial bolus but aliquots maintain a SBP of 80 mmHg.

Primary endpoints: survival to 8 h. All surviving animals were killed by overdose of anaesthetic.

Hypotensive resuscitation was associated with significantly reduced survival time compared to normotensive resuscitation ($P < 0.0001$ Peto log rank). This difference was present in the animals subjected to blast ($P = 0.0005$) but not in those given sham blast ($P = 0.06$). Both hypotensive resuscitation and blast injury caused significant metabolic acidosis (reduced ABE; $P < 0.05$, 2 way ANOVA). Blast injury exacerbated the acidosis caused by hypotensive resuscitation.

Environmental Health and Preventive Medicine Challenges from Kuwait to Baghdad, Feb to July 2003, Operation Iraqi Freedom

S Boos

This presentation will illustrate environmental health challenges encountered by the 30th Medical Brigade and US Army V Corps soldiers during initial planning, deployment to Kuwait, staging operations within Kuwait, and offensive operations in support of Operation Iraqi Freedom from Feb to July 2003. Difficulties and lessons learned for issues such as pesticide treatment of uniforms, individual and unit vector control responsibilities, initial water testing and approval, preventive medicine unit distribution and employment, issues regarding procurement of locally approved food sources, medical unit communication limitations, and challenges of resupply for preventive medicine units will be discussed.

LTC Shawn Boos is an United States Army, Medical Service, Environmental Science Officer that is currently on a two year exchange posting to the Defence Health Services Division, Australian Defence Force.

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Mental Health Support – An Enhancer of, or Detractor from Capability

L Lambeth

It is virtually a given in the military that the maintenance of good health and physical fitness is essential in ensuring operational capability. This has not always been the case with respect to mental health, the provision of which has often been fragmented, reactive and inadequate.

In recognition of this, the ADF launched the ADF Mental Health Strategy in 2002 with the aim of providing a co-ordinated, evidence based response to mental health problems.

This presentation will discuss the benefits and problems, both current and potential in the provision of mental health care. Barriers to care will be examined, as will the ethical dilemmas inherent in repairing a damaged psyche only to send the person back to face the horrors of the battlefield. The aim of mental health support in the military context will be discussed, with the emphasis placed upon the development of resilience and the maintenance and restoration of mental well being.

Methods to prepare military personnel for battle, the management of the soldier damaged in battle, and possible solutions to readjusting to the post deployment environment will be presented. The role of Commanders and their relationship to mental health providers is seen as a key factor in whether mental health support enhances or detracts from capability.

Group Captain Lambeth is Director of Mental Health in the Health Services Division of the ADF. He is a psychiatrist with extensive military experience in both Army and Air Force. Prior to becoming a doctor, he was a mental health nurse. His special interests include the treatment of PTSD and other post traumatic disorders. He is well known in the field of forensic psychiatry. He co-authored "Sainsbury's Key to Psychiatry" which was widely used in the training of mental health nurses.

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Why the Recent Events in Timor Leste were Predictable (and what it means for health)

KL Clifford

The face of conflict has evolved over recent years, with intrastate conflicts now outnumbering interstate conflicts worldwide. Intrastate conflicts feature more severe effects on civilian populations, with irregular forces and criminal groups targeting civilians and property more directly than previously seen. Humanitarian aid and military interventionist organisations face significant challenges in addressing the complex emergencies arising out of these conflicts, including the issue of access within sovereign nations. Such challenges were repeated in the recent internal upheaval and subsequent response to events in Timor Leste. Challenges include determining the underlying causes of conflict, the ways that populations adapt to cope with problems, and how

international humanitarian and other policies impact on adaptation, resilience and vulnerability; for good and bad.

The international community has become increasingly concerned with these complex challenges, with significant efforts being undertaken to develop reliable indicators that potentially provide early warning of violent and non-violent social disruption. The development of such tools and methodologies should be supported by military health planners as they have the potential to support military health risk assessment and operational tasking.

Noting advances made in such early warning systems, it can be readily seen that the recent events in Timor Leste were in many ways entirely predictable. Based on research undertaken by international agencies, this paper will explore why this was the case. As a result, the identifiable determinants for internal conflict will be identified as critical for future operational health planning surveillance.

MAJ Clifford is currently posted at the 1st Health Support Battalion at Holsworthy, NSW. Major Clifford is currently studying to complement his Masters in Health Administration with a Masters in Public Health through the University of New South Wales. In 2005 MAJ Clifford was engaged to undertake a major project looking at the relationship between conflict and infectious disease. He delivered a paper on that subject at last year's ADF Nurses Forum for which he was awarded best paper. This paper will expand on concepts raised, particularly how poor post-conflict support for the fledgling Timor Leste government predictably led to recent upheaval and significantly elevated health risks for all.

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Workplace Assessment: Non-Ionising Radiation Hazard – Fleet Base West Health Centre

N Westphalen

The Training Unit ANZAC Ship Support Centre – West (TU ASSC-W) at HMAS STIRLING was opened in May 2005. It is adjacent to the Fleet Base West Health Centre (FBWHC) and co-located FBW Psychology Section. TU ASSC-W has two radars which are used to train RAN personnel in their use and maintenance.

Concerns involving the effects of these radars on FBWHC patients and staff resulted in a review to assess their compliance with the ARPANSA protection standard for radiofrequency fields between 3 kHz and 300 GHz.

The review began with a literature search outlining the evolution of non-ionising standards, beginning with exposure limits set by the US Navy in the 1950's to the promulgation of the ARPANSA exposure limits in May 2003. It is known that excessive radiofrequency exposure can overwhelm the thermoregulatory capacity of the body, resulting in harmful levels of tissue heating. The ARPANSA standard also has extensive information on non-thermal radiofrequency bio-effects on humans, but also notes that there are no clear or consistent indications of causation with any human disease. Conversely, these studies have not confirmed the absence of a hazard.

Average and peak radiofrequency measurements were taken at various locations with the TU ASSC-W radars in various modes. These were compared with the ARPANZA average and peak exposure limits for the general public. All measurements complied with these limits.

Although this means no additional hazard mitigation or control measures are necessary at present, it was recommended that further RF assessments be undertaken following maintenance work on the radars, and after additional radiofrequency emitters (antenna farm and phased-array radar) are built at TU ASSC-W in the next 2-3 years.

CMDR Westphalen qualified at Adelaide University in 1985 and joined the RAN in 1987. His civil postgraduate qualifications include a FRACGP, a MPH and a Dip AVMED. On the military side, he completed the RAN Staff course in 1996.

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A Hero Before Gallipoli

MH Dowsett

Seven months before Australian and New Zealand troops landed at Gallipoli an Australian Army medical officer, Captain Brian Pockley AAMC became the first Australian officer to die in World War 1. Pockley was mortally wounded on 11th September 1914 and died later that day

He was a member of a little known but significant military campaign that took place in German New Guinea that was the first joint Australian operation by the Navy and the Army. It also involved French forces and thus predated Australia's involvement with the French on the Western Front.

The presentation details the campaign by the Australian Naval and Military Expeditionary Force and the tragically short medical career of captain Brian Pockley.

Commodore Michael Dowsett is a former Director General of Naval Health Services of the RAN with a long standing interest in Naval and Military medical history and has published and presented a number of papers on these topics.

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Combat and Military Mental Health Care: The Future

H Holloway

Developments in the basic sciences and epidemiology will be important to future changes in combat and military mental health care. All aspects of military medical and mental health practice are constrained by military culture, technology, values, laws and traditions within the larger national socio-cultural context. Military mental health services must provide a wide array of services and research products. Recent studies demonstrate the importance of psychiatric casualties to troop losses. (See Hoge & associates, Wesley & Jones, and Lars Weisaeth) Changes in military organizations and the application of the results of the genomic, molecular

neurobiological revolution will modify the principles and organization of military psychiatry. (See Insel & Collins) Military parameters influence everything from the organization of personnel management to the organization of the combat space. Revolutionary information technology and smart weapons have increased mobility, fire power and target acquisition capacity, and integrated the utilization of ground force, sea force & air assets. Small, powerful, highly specialized and integrated combat teams with equivalent firepower are replacing large maneuver elements, like the Division. When the Division disappears, the division psychiatrist disappears from forward combat space. Stress control units are unlikely to survive in this combat space. Such units may be useful in providing area services in low intensity situations but deployment of any medical personnel with maneuver units may become impossible. As intensity of combat increases, a safe area may mean mental health care distant from the combat area – otherwise the provision of safety and respite will be impossible. Return of casualties to duty in combat teams may be impossible. The principles of proximity, immediacy and expectancy have become obsolete. Evacuation of all psychiatric casualties may increase their stigmatization. Rethinking the organization of pre and post combat mental health care is mandatory and the importance of supporting military families may require reassessment and greater emphasis. Perhaps advances in molecular neurobiology plus genomics can improve the assessment of epidemiology of risk and the effectiveness of interventions. This approach might be applied to improve both selection and training for resilience. [e.g. Charney & Manji's publications have described factors related to the capacity of those performing in high stress environment to display resilience. Publications by Caspi and co-workers documenting the importance of polymorphism in the 5HTT gene in influencing the risk of depression following stress may be important.] One of the still pressing questions in military psychiatry is how to understand and manage the response to traumatic experiences. Some tentative organizing principles in providing mental health service may be to strive to match preventive and treatment resources to special needs in the changing military environment, and to develop the epidemiologic data required to support effective prevention and treatment programs. The dream of using selection to reduce casualties will be a continuing issue. A critical scientific and ethical dialogue concerning the opportunities that will appear in the genomic era is important if we are to do no harm.

Prof. Holloway is presently at the F. Edward Hébert School of Medicine where he serves as Professor of Psychiatry and Professor of Neuroscience. Prof. Holloway is the author of more than 200 hundred articles, book chapters and major reports. He is Life Fellow of the American Psychiatric Association (APA) and has received the APA's Distinguished Psychiatrist Award. Prof. Holloway was awarded the honorary degree of Doctor of Military Medicine by USUHS in 1992. He has received the Legion of Merit and Defense Superior Service Medal. He has received NASA Medals for Leadership, Distinguished Public Service, and Distinguished Service.

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Australian Military Hospital (Dili) – Operation Astute

JR Bessell*, W’ORegan, P Sharwood

Operation Astute was launched on 26th May 2006, as a coalition peacekeeping force for the restoration of law and order in East Timor. A Surgical Platoon from 2nd Health Support Battalion was despatched on D +1, and subsequently became the Australian Military Hospital (Dili).

The function of the hospital will be described within the framework of the tactical scenario encountered at the time.

A case will be presented of a foreign national treated at the hospital for major trauma. The case represents the typical situation encountered whereby armed gangs clashed with machetes and swords. The patient’s management included fresh whole blood transfusion in the field, exposed some deficiencies with key theatre equipment, and necessitated complicated intra-operative international political negotiation.

The case resulted in a successful outcome but offers insights into some unique challenges faced by Level 3 Health Support deployed in support of current ADF operations.

LT COL Justin Bessell is Army Reserve, currently posted as OC of S.A. Coy, 3 HSB. He is a General Surgeon with an interest in trauma at Flinders Medical Centre. He has seen active service with the ADF in East Timor twice, Solomon Islands and Banda Aceh, and spent 12 months on exchange with the British Army.

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Oberon Class Submarine Occupational Hygiene Project – Creation of a Hazard Exposure Profile

SM Bennett*, D Pisaniello

Introduction: In recent years, concerns have been raised regarding the poor working conditions experienced by Navy personnel deployed on the Oberon Class submarines, and the potential adverse health effects of this environment. In addition, many current and former submariners have had difficulty in processing compensation claims with DVA due to the lack of recognition of the hazards experienced during their submarine service. The Centre for Military and Veterans’ Health was commissioned by DHS to undertake a retrospective occupational hygiene survey of the Oberon Class submarine with the aim of identifying known hazards and, where possible, estimating exposures and risk of harm.

Methods: The retrospective nature of the survey required a different approach to that of an occupational hygiene survey undertaken in an active work environment. The multifaceted approach adopted for this study involved: a review of the available literature, both published literature and departmental documents; a static site inspection of a decommissioned Oberon submarine; the conduct of two focus groups of Oberon submariners to describe experiences and assist in identification of hazards; and consultation with individuals with expert knowledge in both Oberon submarines and occupational health

and safety. The information from the abovementioned sources was triangulated, with professional judgement, to deduce the exposure profile, according to hazard category.

Results: The exposure profiles illustrate that widespread and significant exposures to carbon dioxide, (reduced) oxygen and pressure changes occurred on the Oberon Class submarine. Additionally, certain Oberon submariners were significantly exposed to diesel fuel, carbon monoxide and the more traditional types of workplace hazards such as noise, heat, solvents, musculoskeletal and psychological hazards. Dermal exposure was exacerbated, and mixed exposures common.

Discussion: The occupational hygiene literature for Oberon Class submarines is sparse. However, it can be said that engine room crew probably experienced a range of significant exposures by virtue of their proximity to the diesel engines and all of the crew were exposed to a cocktail of substances by multiple routes. Whilst the identified types of hazards are not unique to the Oberon submarine the context, of defined spaces and 24 hour exposures, in which the submariners were exposed was unique. In addition, the limited washing facilities and potential for synergistic exposure, e.g. between noise and solvents, need to be acknowledged.

Dr Sonya Bennett MBBS FRACGP MPH&TM CMDR, RAN Sonya is a Medical Officer in the Navy and currently in the position of Research Manager at the Centre for Military and Veterans’ Health. Sonya’s research interests primarily include tropical medicine and public health, but she has strong historical ties with the submarine community and was very pleased to have the opportunity to be involved in this worthwhile project aiming to document the potential hazards Oberon submariners were exposed to.

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Nicotine Addiction – A New Approach to an Old Problem

R Bittoun

Smoking is still the most preventable cause of morbidity and mortality in Australia today - approximately 50% of long-term smokers die from it. Prevalence of smoking is highest in the age range most represented in the military. Smokers are however not a homogenous group. They have varying plasma levels of nicotine, vary in nicotine metabolism, they may range from mild to severe levels of dependency and they may respond to pharmacotherapies differently. Nicotine Replacement Therapy (NRT) is the most accessible, safe, and effective non-prescribed pharmacotherapy for smoking cessation. Though NRT has shown to double quit smoking rates the vast majority of smokers using NRT fail to quit. This paper will describe the current practice of “combination therapy” using NRT aggressively in a variety of forms. The paper will also present validated enhanced effects on long-term abstinence rates in smokers who have been treated by individual targeted replacement therapy which accounts for the wide variability in smokers.

Renee has worked in Smoking Cessation for more than 25 years. Set up first Smokers’ Clinic in Australia at St.Vincent’s Hospital, Sydney in 1979. Currently Director of the Smokers’

Clinics, Central Sydney Area Health Service, Senior Research Fellow and Head of the Smoking Cessation Unit at the Woolcock Institute of Medical Research and Clinical Associate in the Faculty of Medicine at the University of Sydney. She is the author of several books on smoking and quitting both for the public and as texts and many research articles on smoking cessation. She established first university course on Nicotine Addiction and Smoking Cessation Course at University of Sydney and is President of AASCP, The Australian Association of Smoking Cessation Professionals. Renee has recently been appointed Editor-in-Chief of a new international peer-reviewed Journal of Smoking Cessation.

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Health Services Evaluation

C Jenkins

Health Services Evaluation leads the implementation of strategies to evaluate and improve the management of health services within the National Support Area of Defence Health Services. This includes reviewing overall health services on a base by base basis and nation wide provision of specialized services such as optometry and pathology.

These reviews identify ways of improving value for money through the use of

contemporary business processes, good governance and enhanced resource management.

The recent review and restructure of health services provision to Puckapunyal will be used as a case study to highlight the work of HSE and help identify the environment in which HSE functions.

HSE undertook a review of Puckapunyal considering political, governance, current and future activity levels, performance standards, risk management, staffing implications and infrastructure issues. This review indicated that the Puckapunyal

Health Centre (PHC) lent itself to a Prime Contractor model; it was a tailor-made health solution and was considered to be the basis for future market testing activities.

Aspen Medical assumed responsibility for the provision of all health services to ADF personnel based at Puckapunyal in May 2005. These services include primary health care, specialist outpatient services, inpatient services, diagnostic and allied health services as well as dental services.

Aspen Medical was selected as the Contractor to provide these services after a full market testing activity. The market testing activity included the full range of health services that will be provided both on and off base to ADF personnel in the Puckapunyal Military Area. As part of its commitment to building the local job market, Aspen Medical was given first consideration for offers of employment to current providers who wished to be re-engaged.

This contract brings significant benefits to the people of Seymour and its surrounding district as Aspen Medical has arranged to bring a number of new specialists into Seymour to see Defence personnel as well as other patients from the general community on a regular basis.

The arrangements that have been implemented for Puckapunyal are the first of a number of similar initiatives that

will be implemented at selected Defence Bases across Australia. The contract provides the highest calibre of health services which will guarantee quality health care for our serving personnel while ensuring value for money for Defence.

Carolyn Jenkins heads up the Directorate of Health Services Evaluation within the Defence Health Services Division of the Department of Defence. In addition to reviewing health services, her Directorate develops business options for re-engineering or outsourcing health services including enhanced governance and procurement frameworks. A secondary school teacher by training, she has worked in a number of Commonwealth departments managing a range of policy and program management issues in industrial relations, defence, industry and consumer affairs. Previous public service roles have included administrative review; complaint investigation and resolution; evaluation of policies and programs; R&D and innovation policy; and change management including developing new business partnerships, innovative service delivery arrangements and Service Charters. A graduate of Queensland University, she also holds qualifications in Public Law and has a Master of Letters from New England University.

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Escalation and Implementation of Commercial Healthcare Provision in an Operational Environment

G Keys

Aspen Medical has established itself as the pre-eminent Australia supplier of operational and project based health in the region. However, the main issues facing a commercial provider of healthcare in operational environments are how to cope with rapid escalation of an operational environment, or immediate deployment into a new operational environment.

This paper discusses a range of issues relating to both implementation and escalation, and uses the recent events in Solomon Islands and Timor as case studies.

Aspen Medical has been contracted to provide all medical, dental environmental health and health management services to Regional Assistance Mission to the Solomon Islands (RAMSI) members who are currently based in the Solomon Islands.

In April 2006, political unrest in the Solomon Islands resulted in an escalation of health care provision to support the AFP in their operations. The ADF sent additional personnel to increase the security during for a six week period. Aspen Medical provided all health care to the AFP during this period of heightened security and level 3 facilities for the ADF.

In May 2006, a small AFP contingent was sent to Dili to assist with OPERATION ASTUTE. Aspen had a full Primary Health Care Team and equipment waiting departure within 72 hours of the first approach by Patrick Defence Limited on behalf of the AFP.

CASE STUDY 1 - Solomon Islands escalation

This paper discusses the initial conditions prior to the increased security threat and the escalation in services required to meet the demand, including:

- The volume and types of presentations
- The provision of forward command post health support
- Operational Status
- Personnel issues
- Security

The paper then discusses the return to steady state and future contingencies.

CASE STUDY 1 - EAST Timor implementation

This paper then discusses the mobilization of Aspen personnel and equipment to support the AFP in Dili, including:

- The operational situation
- Health Services provided
- Operating environment

The current situation and services are then discussed and the future for continued support.

A Commercial Health Provider in an OPERational Environment

Discussion then turns to health support in a traditionally Australian Military Operational environment, including:

- Ability to respond immediately
- Flexibility to respond to as the operational situation dictated
- The use of multi-skilled personnel

What does the future hold

Paper summarizes the following:

- The ability for a commercial health provider to support ADF operations from the commencement of an operation
- The ability for seamless transition with the ADF in the provision of Health Services in an operational environment
- The ability to relieve the ADF of the constant requirement for the deployment of their limited health assets
- The option for ADF Health Personnel to be embedded in a commercial contract to allow management by a commercial provider but still offer ADF personnel the opportunity for deployment.

Glenn Keys is the CEO and Managing Director of Aspen Medical. Glenn's career covers a broad range of businesses, from start-up's to multi-nationals. After a distinguished career in the Australian Army, where he was responsible for a range of operational tasks, both in Australia and the region, Glenn entered the civilian arena. He was responsible for the establishment of a number of new businesses in companies such as Raytheon; a US\$25B company. Glenn has worked closely in a number of international locations, including the UK, Indonesia and Malaysia. Glenn's paper discusses a range of issues relating to both implementation and escalation, and uses the recent events in Solomon Islands and Timor as case studies.

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Three-dimensional Scanning In Anthropometry – Bringing New Techniques and Applications to an Old Science

ND Daniell*, T Olds, J Ross, S Morris, D Stratton

The purpose of this paper is to highlight the capabilities of 3D scanning through a number of studies researched by the University of South Australia. This took place during the completion of the Australian Defence Anthropometric Personnel Testing (ADAPT) project, an Australian Defence Force (ADF) funded project.

Prior to three-dimensional (3D) scanning, anthropometrists were required to manually measure the human body using traditional tools such as anthropometers and tape measures. In the last decade 3D scanning has progressed rapidly with the accuracy and reliability now considered acceptable for many industries such as clothing, textiles, sports science, ergonomics and anthropometry.

Recently UniSA has been involved with the multi-million dollar ADAPT project which was funded by the ADF. UniSA controlled the anthropometry phase where the Vitus Smart 3D scanner was used to scan both civilians and RAAF aircrew. In conjunction with completing this project UniSA used the 3D scanner for a number of research studies. The completed research studies demonstrate the applications of 3D scanning technology in a variety of research fields.

One such study compared measurements from the Vitus Smart hardware-software suite to physical measurements. This helped determine the reliability and validity of the scanner. Results indicated that when using physical landmarks, the scan-derived measurements were comparable to physical measurements. The technology was also applied to the clothing industry where two studies were completed focusing on current clothing sizing standards devised by Standards Australia (SA). The current SA sizing standards are quite outdated with results from the studies showing a need for revision of the current SA standards. Another two studies investigated posture analysis with the first testing for reliability in taking postural measurements using the 3D scanner. The second posture study compared 3D postural measurements to observational measurements reported by qualified physiotherapists. A final study which is in progress is researching the accuracy of body volume and segmental body volume measurements extracted from 3D scans.

The ADAPT project will also be briefly discussed. These studies highlight the many research areas in which 3D scanning technology can enhance research capabilities.

Nathan Daniell is a PhD student from the University of South Australia. Throughout 2004-05 as an honours student he played an important role in a nation wide project funded by the ADF. This provided him with a unique experience to develop skills in anthropometry. It also exposed him to 3D scanning, a new technology that has many future applications.

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The First Case-control Studies - Rum Ration Protects Against War Neurosis and Positive Family History Predisposes

KWA Horsley*, EJ Wilson, G Hawthorne

Background

Traditionally, the pioneering work of Lane-Clayton (1926) on breast cancer is recognised as the first example of a case-control study. Here we show that Sir Frederick Mott published a case-control study in 1919; his colleague, Dr Julian Wolfsohn, published a concurrent case-control study in 1918.

During World War One on the Western Front, the British Army gave soldiers a daily ration of rum.

Aim

To examine if consumption of the rum ration and a family or personal history of neurosis was associated with the development of post-traumatic neurosis.

Methods

The cases in the Mott study were 141 military men who were receiving inpatient treatment for war neurosis. The controls were 59 military male patients from a nearby surgical hospital who were not suffering from shell shock or war neurosis. Both cases and controls were asked if they took the rum ration. Wolfsohn similarly selected 100 cases and 100 controls, and asked about family and personal history of mental illness.

Results

The sufferers of war neurosis were much more likely to have refused the rum ration during their service than were the surgical patients, with an OR of 0.37 (95% Confidence Intervals 0.18, 0.77). Wolfsohn noted several significant associations, such as a family history of "nervousness" (OR of 10.07 (95% CI 5.08, 19.97)).

Conclusion

This study suggests that chemo-prevention against the development of post-traumatic neurosis is possible. Wolfsohn's work suggests that a family or personal history of mental illness predisposes to war neurosis. The history of the case-control study is also longer than widely believed.

Dr Keith Horsley has worked in the area of veterans' health, working mainly on mortality and cancer incidence studies of Australian veterans.

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Business Management Issues

R Wilken

Introduction

The role of the Business Manager in DHSD is to support the delivery of the required health services to ADF members posted to Defence establishments across Australia. These services can be delivered by Military personnel, public servants and contracted health providers. Preference is given to delivery on site at dedicated health facilities.

This presentation will look at issues relating to the funding of services, how DHSD contracts for services and future

contracting options, and issues relating to Military, APS and Reserve personnel supporting the delivery of health services.

Finance

Over the last year, DHSD conducted a study of the cost of the Division delivering health services to the ADF. The study indicated that the full cost of DHSD services provided to the ADF in 2004-05 was \$291m. This represents a cost of \$5,598 per ADF member, and is some 40% higher than the \$3,931 average per capita cost found for the Australian community. (This excludes health support provided directly by the Services for operational and other activities.)

DHSD has experienced double digit growth in costs in recent years although the growth rate was lower in 2005-06 and this looks to continue in 2006-07.

The presentation will review cost drivers for the growth in health expenditure and look at future funding issues.

Contracting

Defence requires that DHSD has a contract with all health practitioners that deliver services at Defence sites.

DHSD has a range of contract arrangements including:

- Locally tendered contracts for Health Providers (CHPs) that practice 20-40 hours pw;
- Contracts for Sessionalist Health Providers (SHPs) delivering services from a few hours to a few days in a week;
- Standing Offer Panel for CHP services; and
- Base (turnkey) contract as at Puckapunyal where contractor manages and delivers all services.

Most (excluding Puckapunyal) expire in 2006-07. The presentation will examine issues with Defence contracting and proposals for the year ahead.

Human Resources

DHSD employs 521 Military personnel and 415 APS staff to provide clinical and administrative services. The presentation looks at some recent trends and issues for the future.

Ray has been in the position of Business Manager of Defence Health Services Division for a year. Prior to Defence Health Ray worked in Defence Management Audit of the Inspector-General Division reviewing issues related to the Defence Financial Statements.

Ray has tertiary qualifications in economics and accounting, and has been a CPA for over a decade. Ray also graduated from the Joint Services Staff College in 1989.

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Australian Military Aerospace Medicine; Science, Art and Reality

GV Hampson

After 50 years of dedicated service the Royal Australian Air Force Institute of Aviation Medicine (AVMED) continues to play a vital role in enhancing human performance, effectiveness and safety in ADF aerospace operations. AVMED functions include; aviation medicine, physiological and human factors training for ADF aircrew and other aviation-related personnel; applied research, development, test and evaluation,

clinical aviation medicine governance and ADF aircrew medical boards; and specialist aviation medicine/human factors services (such as accident investigation, motion sickness desensitisation, CRM training/accreditation and subject matter expert lectures/ briefings). Through these roles, AVMED functions as a centre of expertise in military aerospace medicine in Australia and for a unit of its size has an enviable reputation in the international aerospace medicine scene. AVMED is a small unit that in the continuously strives to improve the quality of support to ADF aerospace operations in an increasingly diverse, operationally challenging and resource-constrained environment. At times, this necessitates both cunning and innovation, for example, the development of Combined Altitude Depleted Oxygen (CADO) for hypoxia training secondary to concerns with traditional hypobaric hypoxia training from our federal regulators of occupational health and safety. 2006 has seen AVMED's command and control change from Air Training Wing to the Air Systems Development and Test Wing of Aerospace Operational Support Group (AOSG). This change brings AVMED directly under Air Command with closer alignment to aerospace operations and synergies with other AOSG RDT&E units such as ARDU. Affiliation with the University of Adelaide strengthens AVMED's academic resources. In parallel with increasing challenges in contemporary and near future ADF aerospace operations, AVMED's mission "to enhance human performance and safety in aerospace operations across the ADF" is becoming more challenging. Early recognition of potential and actual human performance issues and an integrated approach to best practice/operationally relevant solutions is AVMED's goal. In today's reality this not only means all the functions as above, but in addition the constant promotion, evaluation and education of aerospace medicine to our aviation leaders, lest complacency and fiscal indifference leads to a gradual decline in our aerospace medicine/human factor capability.

WGCDR Hampson is the current commanding officer of the Royal Australian Air Force's Institute of Aviation Medicine. His background is operational health support.

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The Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP).

C D'Este*, J Attia, A Brown, P Schofield, R Gibberd, J Byles, M Tavener, R Gibson, M Guest, K Horsley, W Harrex, J Ross

Introduction:

The Study of Health Outcomes in Aircraft Maintenance Study (SHOAMP) was an epidemiological study conducted in response to health concerns, including memory loss, fatigue, and other neurological problems, by workers in the F-111 aircraft Deseal Reseal (DSRS) Program. Workers had a variety of exposures including solvents and jet fuel.

Methods:

Consenting subjects from the F-111 DSRS group (n=659) and two comparison groups - technical personnel at a different Air Force Base (n=600) and non technical personnel at the same base (N=495) - completed a mailed Postal Questionnaire and/or had a physical examination. Data were collected on a variety of outcomes including general health and wellbeing, neurological outcomes, male sexual function, mental health, and cognition and memory. Linear or logistic regression analyses were conducted to compare adjusted outcomes across the three groups.

Results:

The F-111 DSRS group had statistically significantly higher proportions of self-reported sensory and motor neuropathic symptoms, higher self reported physician diagnosis of erectile dysfunction, depression and anxiety, executive functioning, psychomotor speed, quality of life, and slightly higher colour vision deficits. There were no differences in olfaction, neuropathy, or attention/working memory tests.

Discussion:

Although there are uncertainties in the interpretation of the study results due to such factors as uncertain sampling frames, potential survivor bias, low participation rates, and multiple comparisons, the results indicate an association between F-111 DSRS involvement and a lower quality of life and more common erectile dysfunction, depression, anxiety, and subjective memory impairment. There is also evidence, albeit less compelling, of an association of DSRS with neuropsychological deficits.

Associate Professor Cate D'Este is currently working at the Centre for Military and Veterans' Health at the University of Queensland in the Deployment Health Surveillance Unit. She is a biostatistician and has previously worked for 10 years at the Centre for Clinical Epidemiology and Biostatistics at the University of Newcastle, NSW and has extensive experience in the design, conduct and analysis of a variety of research projects. Associate Professor D'Este is the Chief Investigator for the Defence deployed Solomon Islands Health Study, which is a study of the health of Defence personnel deployed to the Solomon Islands. She was one of the investigators for the Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP).

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The Ever Changing Challenges of Military Health Care Delivery in the 21st Century

T Austin

Conventional wisdom is that a military force is able to project national power through its ability to deliver potentially lethal force. The traditional role of a western military health care systems has been the conservation of the fighting force. This has been achieved by a complex intermix of force preparation, injury and disease prevention coupled with the ability to deliver quality health care across a wide range of challenging environments, if not actually in the face of

combat. While this is a highly challenging task, the patient population comes from a narrow demographic, the majority of diseases and injuries seen are almost always acute in onset and rearward evacuation is the norm rather than the exception.

Over the last few decades there has been a subtle shift in the way that military health care systems are used to support national objectives. While most deployed health forces have been permitted to offer varying degrees of humanitarian assistance to the local civilian populations, the primary mission has almost always been to support the deployed military force. As the ADF has become more actively involved in peacekeeping and peacemaking operations the provision of humanitarian assistance has taken on a greater role. This has created a challenge for many health care providers as it now confronts them with a much wider patient demographic, a large burden of chronic or exotic diseases and a cultural dimension that may be entirely foreign. Even more recently ADF health care teams have been deployed overseas in disaster response missions where the provision of care to the local population is the primary mission. While the challenges of providing humanitarian care are significant in their own right, there is the additional burden on the deployed health workers of being an effective and positive ambassador for Australia.

This paper will explore this shift in strategic tasking and discuss the challenges that now confront the health services as they adapt to this more complex role.

Air Vice-Marshal Tony Austin was commissioned into the RAAF as a medical undergraduate in 1980. Tony has served as a medical officer in Australia and has had tours of duty in Malaysia and with the United States Air Force in Virginia. Tony has commanded the RAAF Institute of Aviation Medicine and 3 RAAF Hospital. For the past 9 years he has held senior medical staff appointments culminating in his current position as Head Defence Health Services in Canberra. Tony has a strong interest in all facets of clinical governance with a particular emphasis upon patient safety.

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The Electronic Medical Record from the Battlefield to the States: Leader Lessons from Iraq

E Granger

Context: The United States Army Task Force 44th Medical Command provided joint Health Service Support to Multi-National Corps Iraq full-spectrum – in war and in military operations other than war – counterinsurgency operations. Counterinsurgency operations are those military, paramilitary, political, economic, psychological and civic actions taken by a government to defeat an insurgency. The Task Force was also responsible for developing a sustainable Iraqi Military Health System.

Issue: The task force provided optimal joint Health Service Support by sustaining and conserving Multi-National Corps Iraq combat power and momentum through disease prevention and combat casualty care provided to the right patient at the right military treatment facility in the right amount of time. At

the outset of Operation Iraqi Freedom 04–06, the Task Force had limited theater guidance on implementing the electronic health record for deployed forces. In addition, the theater did not have a consistent policy of how to document health care. Consequently, paper remained the standard method for health care documentation.

Discussion: Through an aggressive campaign plan, the Task Force 44th Medical Command and Multi-National Corps Iraq defined, implemented and maintained a congruent electronic health record policy among military treatment facilities and health care providers in theater. The electronic health record, combined with command and control systems, gives medical providers visibility not only on types of injury and disease but where they are occurring geographically. While these systems provide invaluable data at the next highest level of care, they also provide tools for analysis that optimize resources at each level of care.

Lesson Learned: The electronic health record is a standard business practice and must become doctrine. Additionally, it must become a standard critical task among several courses at the U.S. Army Medical Department Center and School.

Recommendation: The headquarters surgeons at all levels must clearly define and execute the electronic health record policy and guidance as outlined by the U.S. Assistant Secretary of Defense for Health Affairs.

Major General Elder Granger is the Deputy Director and Program Executive Officer of the TRICARE Management Activity, Office of the Assistant Secretary of Defense (Health Affairs), Washington, DC. MG Granger serves as the principal advisor to the Assistant Secretary of Defense (Health Affairs) on DoD health plan policy and oversight of the health plan performance.

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“An Outsider Looking In” – E-Health in the US DoD

RF Curtis

Introduction - The US DoD Military Health System has a head start on the ADF in health informatics and telemedicine. Commands and individual units are attempting to establish telemedicine systems whilst the Tricare Management Activity (TMA) is deploying a new global health information system and electronic health record (EHR), AHLTA.

Methods - The author was the Department Head of the US Navy Telemedicine Business Office (NTBO) at the US Naval Medical Information Management Center (sic)(NMIMC). He participated in and had cognisance of a number of military telemedicine and e-health forums, working groups and projects.

Results - The major sector in US DoD telemedicine remains teleradiology, but technological advances have led to the increased use of telemedicine in other specialties. The sustained and ‘garrison’ nature of operations in Iraq and Afghanistan has also led to an increase in the adoption of telemedicine to provide reach back to continental United States. The Digital Imaging Networks and Picture Archiving & Communications Systems (DINPACS) Joint Service Working

Group has sought commonality across service lines in the practice of teleradiology and also sought to determine common interservice standards on issues such as vocabulary, archiving, compression standards and incorporation of images into the EHR. Unfortunately, commonality of CR equipment is not achieved as there are seven vendors on the preferred supplier contract and equipment below a certain amount can be purchased locally. One common element is the 'Medweb' teleradiology server in use in Army and Air Force and being introduced into Navy. The US Navy Telemedicine Integrated Process Team (IPT) sponsored by NMIMC sought to identify clinical, business and technical aspects that result in a successful and more importantly, sustainable telemedicine network. The IPT report was published in Nov '05. The Military Health System's Telehealth IPT, sponsored by TMA, has sought commonality of practice between individual services telemedicine ventures and where possible cross service participation in each others networks. AHLTA is the new WinXP based military-wide hospital information system / practice management tool / electronic health record. It supersedes the 14 year old, DOS based Composite Health Care System (CHCS). The deployment of AHLTA is a huge undertaking. AHLTA will also be required to interface with CHCS-IIT and CHCS-NT the ambulatory and non-ambulatory care 'field deployable' health information systems / EHRs.

Discussion - The US DoD Military Health System is gradually becoming one integrated entity. The necessity borne from current operations overseas and the development of strategic e-health technologies is forcing that change upon them. This restructure will in time have the effect of tearing down organisational, inter-disciplinary and paradigm barriers that in the past have prevented telemedicine and health informatics successes. The ADF as a partner in the 'Global War on Terror' should continue to monitor developments in that arena with keen interest, particularly regarding potential interoperability with the US deployed health informatics systems and sharing of telemedicine resources.

LCDR Bob Curtis is currently the e-Health Officer at Centre for Military & Veterans Health at University of Queensland. Between Jan 2004 and Feb 2006 he was an exchange officer with the USN heading the US Naval Telemedicine Business Office in Bethesda, MD. He holds a B.AppSc in Environmental & Occupational Health from UWS, Hawkesbury. He has had a long career in the RAN Medical Branch as a general medic, pathology technician and pre-hospital care technician dating back to 1979 and as a Medical Administration Officer for 12 years. He saw operational service in HMAS SYDNEY during the first Gulf War, but considers his recent tour of duty in the U.S. as the highlight of his career thus far

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Challenges and Innovation of Technology-based Mobile Health Care Solutions in the Department of Defense

T Morris*, R Clerici, K Chism, G Mogel

This paper discusses the challenges and innovation process of the Battlefield Medical Information System Tactical (BMIST) architecture and technologies. The BMIST is an advanced mobile healthcare solution that is transforming business processes and driving organization-wide benefits. Its scalable architecture integrates powerful decision support tools and sensor inputs into an electronic health information system. BMIST is used by our military to reduce medical errors and greatly improve health care for our soldiers worldwide. The BMIST is designed as a multifunction suite of mobile applications empowering our providers with access to critical information supporting their increasing roles around the world and in varying operational environments. BMIST uses mobile networking environments to securely move complete health information, providing seamless continuity of information from the point-of-care to various health information and surveillance systems. These systems include but are not limited to the Theatre Medical Information Program and AHLTA, DoD's premier electronic health systems. This paper also describes triple helix efforts underway to incorporate self describing information, biodosimetry assessment and multimedia training tools into the scalable BMIST architecture. As a DoD program of record, the BMIST is being used extensively in the U.S. military to create an electronic health record far forward that supports a longitudinal medical record across time and across all elements of the Military Healthcare System.

Mr Morris is the Director of Mobile Computing; CITO for the U.S. Army Telemedicine and Advanced Technology Research Center (TATRC), Morris is an accomplished and seasoned veteran and served as tactical paramedic with extensive knowledge in remote military medicine. He has degrees in computer engineering and communications. Mr Morris has numerous patents pending in mobile computing and healthcare technologies. Mr. Morris functions as a Medical technology consultant to the White House Medical Unit, responsible for developing numerous mobile computing applications for the White House and other federal agencies.

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Changing Times – Doing Things Differently

J Lumby

Globally health care services and professionals are being forced to recognise that health cannot be defined or limited in its construction, just as health care is no longer carried out within four walls of an organisation. Increasingly, it is clear that we have an 'illness' system rather than a health system with patients healing and rehabilitating in the community.

In 1999, Dr Keith Suter, consultant to the Australian

Institute of Health and Welfare, called for the integration of health and wellness into other political agendas such as education and training. Six years later, NSW has drawn up a State Plan which crosses jurisdictions and recognises that for individuals to have a healthy life and a feeling of well being, then attention needs to be given to many aspects including education, employment, nutrition, housing and environment. Jim Hyde, in addressing the World Health Organisation Rockefeller Seminar in Geneva, urged a rethinking of equity and health demanding that we “go outside the medical framing up of health and illness to social and economic determinants”

There is a growing recognition that health is every body’s right and everybody’s business meaning that we all have an investment in keeping ourselves and others healthy. Yet, there are more people with poor health than those with good health in the world today. This dilemma caused John Ralston Saul to point out that “accessibility to free healthcare is a thing of the past just at the very time when it is needed more than ever”.

Increasingly, however, there are studies showing how we can make a difference to the health status of populations through less expensive means including education, supporting women antenatally and postnatally, encouraging higher breast feeding rates and identifying families at risk and intervening with individual support, education and counseling. In poorer countries, clean water makes an enormous difference to childhood infection rates just as fresh fruit and vegetables do to the nutrition status of our indigenous populations.

This year’s theme of the ADF conference Military Health - The Challenges provides the opportunity to explicate the changing role of the defence forces from one merely of defence to rebuilding communities worldwide from the level of infrastructure through to their sense of well being. This demands active engagement with peoples of all cultures, belief systems and ideas, not an easy task, and one which demands a massive rethinking of what the mission is about.

In so many ways, this is exactly what the health systems and workforce in Australia are being forced to confront. Doing the same things differently and doing different things in recognition that the world has changed and is changing, demanding that we also change if we are to remain relevant.

In addition to her roles as Executive Director of The College of Nursing, Judy Lumby is an Emeritus Professor at the University of Technology Sydney, Honorary Professor at The University of Sydney and Adjunct Professor with The University of Western Sydney. Judy also holds a distinguished alumni award from The University of New England. Professor Lumby’s extensive work, in the areas of liver transplantation, professional and health care issues and patients’ experiences of health and illness, has been published widely in texts and refereed journals. She is a regular contributor to the healthcare debate through opinion pieces and articles in the popular press.

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Force Protection in Southern Afghanistan: The Challenges

DC Randell

Australian forces deployed into Southern Afghanistan are fighting a low intensity war with Coalition forces in an area of operations that covers 160 000 square kilometres. The health intelligence available about this area is limited, due to twenty years of conflict and large population movements that have limited the collection of meaningful data. Under these circumstances, a detachment medical team faces many unknowns in reference to force protection.

This paper will identify some of the challenges faced by the PHCT of the Australian Aviation element deployed on Operation Slipper in March 2006, highlighting force protection issues faced. The process of risk analysis and determination of likely threat levels will be discussed, as well as how these findings impacted on local policy implementation and procedures employed. A series of issues faced will be briefly discussed, including environmental health threats, envenomation, water- and vector-borne diseases.

The role of the detachment primary health care team as part of a Coalition medical asset on a large base will also be discussed, including the contributions required for facility mass casualty incident response and options for mutual logistics and personnel support. The implications for future capability development will be highlighted.

MAJ Randell was the AVMO for the initial Australian Army Aviation Chinook helicopter detachment into Southern Afghanistan in March of this year. He has undertaken advanced training in aviation medicine and is currently posted to HQ 16 BDE and works from the Institute of Aviation Medicine in South Australia.

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A Retrospective Study of the Nature, Circumstances and Burden of Acute and Repetitive Strain Injuries in the Canadian Forces

BA Strauss*, JJ Whitehead, DC Menard, SG MacKenzie, MT Carew

Introduction: Injuries in the military are a leading cause of morbidity, mortality and health care costs. Injuries affect the quality of life of personnel, as well as operational readiness and mission effectiveness. A Canadian Forces (CF) survey in 2004 found that 26% of Regular Force CF members sustained an acute injury and 27% sustained a repetitive strain injury (RSI) in the preceding year; twice the rate of the Canadian population. To assist in prioritizing injury prevention efforts, a retrospective health record review was conducted to describe the nature, circumstances and burden of injuries for both acute and repetitive strain injuries in the CF.

Methods: A sample of Regular Force CF members stratified by sex was randomly selected from a convenience

sample of 3 bases (each representing a different command) and Headquarters. Data were abstracted from 1,938 health records and weighted by base and sex. Incidence density ratios (IDR) and 95% confidence intervals (CI) were calculated by age, sex, rank, and command. Univariate and bivariate statistics were used to describe the nature, cause, activity, and disposition of injuries suffered by CF members.

Results: 1,938 CF members contributed 8,213 person-years (PYs). The IDR for any injury was 75.5/100 PYs (95%CI:75.7-82.9). Acute injury IDR was 47.6/100 PYs (95%CI:44.9-50.3). Acute injury IDR was highest in the Army Command (IDR 79.4/100 PYs, 95%CI:72.0-86.8), members aged 17-29 (IDR 68.9/100 PYs, 95%CI:61.9-75.8), and junior non-commissioned members (IDR 69.3/100 PYs, 95%CI:64.4-74.2). Twenty-nine percent of acute injuries were related to muscles, tendons, ligaments, and cartilage and 65% of injuries involved the extremities. The three leading causes of acute injuries were overexertion, being struck by or against an object or person, and falling. One-third of acute injuries were related to sports/physical training (PT) and 20% involved military training/other military duties. Fifty-four percent of acute injuries resulted in activity restrictions (mean 8.8 days) and lost duty days (mean 2.8 days). RSI IDR was 24.7/100 PYs (95%CI:23.1-26.2). The incidence of RSIs was highest in the Army Command (IDR 40.0/100 PYs, 95%CI:35.9-44.0), females (IDR 34.5/100 PYs, 95%CI:32.5-36.6), members aged 17-29 (IDR 31.2/100 PYs, 95%CI:27.5-34.8), and junior non-commissioned members (IDR 32.3/100 PYs, 95%CI:29.5-35.1). As with acute injuries, 21.7% of RSIs affected muscles, tendons, ligaments, and cartilage and 75.5% of RSIs involved extremities. Thirty percent of RSIs were due to sports/PT and 11.8% were due to route/ruck sack marching. Forty-five percent of RSIs resulted in activity restrictions (mean 9.4 days) and lost duty days (mean 2.2 days).

Discussion: The incidence and burden of acute injuries and RSIs in the CF is substantial. Prevention efforts should focus on sports/PT and military training related injuries, as well as, injuries to the muscles, tendons, ligaments and cartilage and injuries to the extremities. A CF injury surveillance system that collects detailed data on both acute injuries and RSIs is required to prevent and reduce the burden of injuries in the CF by directing injury prevention programs and research efforts.

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Immunisation for Defence Force Protection: Current Controversies

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Immunisation in the defence forces in preparation for overseas deployments is one of the health countermeasures to play an important role in protecting the health and enhancing the overall effectiveness of service personnel. However, immunisation in the defence forces has become a controversial area.

A purported cause of ill health in coalition veterans of the 1990-1991 Persian Gulf War is the administration of multiple vaccines over a short period and/or the administration of particular types of vaccines, either alone or in combination. There is some evidence from health studies of Gulf War veterans that multiple vaccinations are associated with adverse health effects, and that this effect is greater if multiple vaccinations are given over a short period of time whilst in the area of operations. Proposed mechanisms currently centre on a shift in the T cell cytokine balance from Th1 towards Th2 that is proposed to be associated with the development of autoimmune and multisystem illnesses. There is, however, little evidence to support this as a mechanism, and the proposition that an antigenic load from multiple vaccinations could overwhelm the immune system does not have a strong evidence base. In addition, a limitation of much veteran health research to date is the reliance on self-reported vaccinations to assess exposure and self-reported symptomatology to assess health effects. There is also inconsistency across studies in the vaccination exposure variables, such as type and timing of vaccines and the definition of multiple vaccinations, which are used to investigate associations with health outcomes.

Other factors that may contribute to the controversy and perception of the risks include defence health service policies with respect to vaccination and eligibility for deployment, the use of unregistered vaccines in certain circumstances, the use of vaccines against biological warfare agents, possible interactions with other health countermeasures such as nerve agent prophylaxis, response to claims regarding adverse health effects, and the use of multiple vaccinations in current immunisation schedules.

While there is incomplete evidence of the long term safety of multiple vaccinations in adults, it is likely that controversy will continue. Future health research would benefit from more objective measures of vaccine administration such as recorded vaccinations. The continued use of immunisation as a force protection measure in deployments is justified as the benefits of immunisation outweigh any claimed adverse effects. However, improvements in education of service personnel around the benefits and risks of immunisation and enlightened approaches to risk communication are needed to maintain compliance in defence force personnel and to avoid adverse publicity in the wider community.

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Impact of Systemic and Cultural Factors on Trade-related Injuries in the Australian Infantry

WR Payne, JT Harvey*, EL Otago, DA Pascoe

Introduction: Knowledge of the incidence, causative factors and mechanisms of injury are fundamental to the development of well justified and focused injury prevention strategies. A review of existing ADF injury databases indicated that they were incomplete and unable to be linked to particular trade task activities. In particular, there was a paucity of data related to the perceived impact of systemic and cultural factors on trade-related injuries. Therefore, the aim of this study was to determine the perceived impact of systemic factors on the incidence of acute and chronic musculo-skeletal injuries in the Australian Infantry.

Methods: A total of 2351 Australian Infantry soldiers were surveyed in 2004. The paper-based survey was administered in an anonymous manner to all available personnel from the following battalions: 1 RAR, 2 RAR, 25/49 RQR, 3 RAR, 5/7 RAR, 6 RAR and 9 RQR. A total of 299 survey forms were completed (return rate: 12.7%). The limitations of the low return rate are acknowledged.

Results and Discussion: Forty six percent of the respondents had suffered an acute injury in the 12 months prior to the survey and between 16-29%* reported trade-related acute injuries. Forty six percent of the respondents also reported carrying chronic injuries at the time of the survey and 35% reported having trade-related chronic injuries. Overall, these data equated to 820 acute injuries per thousand persons per year (361 trade related) and 800 chronic injuries per thousand persons (380 trade-related or 580 wholly or in-part attributable to trade-related activities). These rates are approximately equivalent to those calculated from two other ADF sources (the Defence Injury Prevention Program database and EpiTrack), and are an order of magnitude higher than estimates made from Defcare data. When asked about the contribution of three systemic factors to trade-related injuries, 22% of respondents who had incurred acute injuries or who were carrying chronic injuries during the 12-month survey period reported manning levels, 35% reported time pressure, and 29% reported equipment limitations contributed to their injuries. A total of 60% of respondents with trade-related injury believed that at least one of these systemic factors contributed to their injury. In 62% of the reported injuries the respondent thought that no safeguards or preventative strategies were in place. When safeguards or preventative strategies were in place, they were generally perceived not to have failed (86%). Risk taking was thought to have been a contributing factor in almost one third (30%) of cases. Key themes which emerged regarding attitudes to injury within the ADF culture were awareness of injury prevention measures; variation in levels of risk taking and avoidance of risk; concern about the effect of injury on capacity to do the job, including deployment, but no concern regarding income or family relationships; and willingness to report injury in spite of some

concern about repercussions. Those with trade-related injuries tended to perceive higher levels of risk taking, less capacity to avoid risks and greater likelihood of being injured, and were less likely to report injury and more likely to fear repercussions of doing so.

- The uncertainty is due to incomplete information supplied by some respondents.

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Japanese Encephalitis Vaccination – Limitations of the current vaccine (JE-VAX®) and the Australian Defence Force involvement in the search for an improved vaccine. An overview of the Acambis ChimeriVax™-JE program.

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Introduction: Japanese Encephalitis (JE) remains an identified vaccine-preventable disease risk for Australian Defence Force (ADF) personnel deploying throughout the endemic region. The licensed vaccine currently in use by the Australian Defence Force (JE-VAX®) has significant limitations for rapid deployment of troops, due to the requirements for a three dose / 30 day regime. It is also costly and likely to be withdrawn by the manufacturer when current stocks are exhausted. The Australian Army Malaria Institute (AMI) has been involved in the Phase 2 clinical program for a promising candidate replacement JE vaccine, called ChimeriVax™-JE being developed by Acambis. The purpose of this presentation is to outline the results of the study series and elaborate on the advantages of live-attenuated single dose JE vaccines over inactivated multidose vaccines for the protection of ADF personnel.

Methods: The Phase 2 program of clinical development involved the conduct of three separate double-blind randomised studies by AMI investigators. The first of these was conducted exclusively on ADF personnel and evaluated the immunogenicity, safety and duration of immunity of ChimeriVax™-JE. Follow-up to 2 years has now been completed and the study has been extended to determine the duration of immunity for up to 5 years. The second and third studies of the series were undertaken under a cooperative agreement between Defence and QPharm Pty Ltd, a private clinical studies unit located in Brisbane. These studies set the foundation for collaboration in clinical research being undertaken between Defence and the civilian sector in areas of mutual interest. The first of these collaborative studies involved the assessment of interactions between ChimeriVax™-JE and the closely related licensed Yellow Fever 17-D vaccine (Stamaril®) on 108 subjects drawn from the civilian community. Again safety and immunogenicity

were monitored between cohorts receiving either ChimeriVax™-JE followed 30 days later by Stamaril®, Stamaril® followed 30 days later by ChimeriVax™-JE, and with both vaccines administered concurrently. The final study in the series was a dose ranging study on the safety, tolerability and immunogenicity of a lyophilised ChimeriVax™-JE vaccine (new formulation) undertaken at both the QPharm site and at CMAX in Adelaide with a total of 128 subjects drawn from the civilian community.

Results: Acambis Study H-040-005 – The safety profile of ChimeriVax™-JE does not appear to be significantly different from placebo, with high rates of seroconversion of up to 98.5%. 95% of subjects remained seropositive at 12 months post dose.

Acambis Study H-040-006 – There were no observed clinically significant interactions between ChimeriVax™-JE and Stamaril® vaccines, indicating that both vaccines could be used concurrently or separated by a 30 day interval. The adverse event profile indicated that there were no significant differences in adverse events between the three cohorts or the placebo group.

Acambis Study H-040-007 – The adverse event profile suggests that irrespective of test dose of ChimeriVax™-JE there is no significant difference when compared to that of placebo. Additionally, viraemia levels post dose were similar between treatment groups and previous findings related to the original liquid formulation vaccine. Similarly, immunogenicity appears similar between the original liquid and the new lyophilised formulations. On the basis of these data, Acambis have progressed ChimeriVax™-JE into Phase 3 studies

Discussion: Findings from the Phase 2 clinical program confirm that the ChimeriVax™-JE vaccine under development by Acambis remains a suitable candidate to meet the ADF needs of an effective and safe, easily administered vaccine for personnel protection from this serious disease threat. The Phase 3 program is currently underway as a multi-site study series conducted in both the US and Australia. The ADF continues to be a partner in this development. The described series reinforces the attractiveness of partnerships between Defence, Industry and the private service providers for the development of preventative health technologies for the ADF.

Peter Nasveld has been a medical officer in the ADF for 28 years with significant defence exposure and deployments to Rwanda, Bougainville and East Timor. He is a Fellow of the Australasian College of Tropical Medicine and over the last 10 years has been involved in research activity with the Australian Army Malaria Institute into Malaria, Dengue and Japanese Encephalitis. The series of trials presented in this session reflect activity conducted while he was the Principal Research Clinician at the Australian Army Malaria Institute. Peter's interest in research is focussed on providing the ADF with practical solutions to preventative health issues which affect deployed forces.

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New Zealand Army Health Challenges

AC Dunn

This is a presentation on the current issues and challenges facing New Zealand Army Health.

It will cover such topics as:

Recruitment and retention of health professionals.

New health initiatives.

Introduction of computerised health records.

And an insight into some aspects of the health of the Army

Lt Col Andrew Dunn is Director of the New Zealand Army Health Services. He is a family physician and holds the Diploma of Aviation Medicine and the London Diploma of Tropical medicine and Hygiene. He served 15 years in the Territorial Force and 10 years in the Regular Force. He spent seven months in East Timor in the year 2000 and was made a Member of the New Zealand Order of Merit for his work in Timor. His family and fishing maintain his sanity.

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Facilitating Air Transport of Military Critical Care Patients – Challenges and outcomes of the major AME staging facility in Iraq

JK Lumsden

In 2004-5, Australian Defence Force health personnel worked alongside the US Air Force and Army in providing Level III health support to US coalition forces, Defence contractors and Iraq civilians in Balad. Balad was the major air evacuation staging point for transporting casualties out of Iraq.

The mortality rate of personnel once reaching medical support in Iraq has been low and about half that of the Vietnam conflict. Patients present with a number of battle injuries but also non-battle injuries, illnesses and exacerbations of chronic problems in a population that spans across all age groups. As the major aeromedical hub for transporting US coalition personnel out of Iraq, and as one of only a couple of Level III facilities in country, some valuable experience and insight has been gained from Australians participating in this deployment beyond individual patient management issues.

This paper will examine some of the issues and outcomes that arose in providing the continuum required for the ongoing healthcare requirements of critical care patients whilst awaiting air transport out of the AOR.

WGCDR Jenny Lumsden joined the Air Force Reserve in 1987 and has been on numerous deployments both in Australia and overseas. She deployed to Iraq at the end of 2004 and was appointed to the inaugural position of Clinical Nurse Specialist or Educator for all staff at the US Air Force Theater Hospital in Balad, Iraq. She is currently part of a project team for Health Services Wing to examine and develop a military Critical Care AME Course for the Air Force. In her civilian

capacity Jenny is a full-time ICU Liaison Nurse at The Royal Melbourne Hospital.

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Methodology for Profiling the Physical Demands of ADF Trades

DC Billing

The ADF Physical Employment Standards (PES) program is a Chiefs of Staff Committee (COSC) directed activity, sponsored by Defence Health Services Directorate (DHSD) on behalf of Head Defence Personnel Executive (HDPE) and conducted by the Human Protection and Performance Division (HPPD) of the Defence Science and Technology Organisation (DSTO).

The PES program involves a thorough profiling of the physical demands of ADF trades through a systematic observation and analysis of the most physically demanding and high risk tasks performed by personnel within the trade.

In order to examine such demands a multi-phased approach has been implemented. Firstly, a representative cohort of the wider trade population is selected for concentrated research investigation. The maximal physical capacities of this cohort are examined using a standard and validated battery of physical fitness tests that are appropriate for the trade of interest. The evaluation of maximal physical capacities serves to provide an indication of the underlying fitness of the trade personnel and to provide a relative reference for the percentage of maximal capacity each individual is exerting during the performance of trade tasks.

Once maximal physical capacities have been evaluated a two-phase trade task field observation is implemented. In the first phase simulated task activities are performed by the same representative cohort. Simulations are designed to capture the variety of techniques and strategies that may be employed by personnel to complete required trade tasks. Through this process an understanding of the best-case, norm, and worst-case physical demands and risk of both discrete and serial activities, can be profiled. The second phase involves observation of a formal exercise staged by the trade management and takes in additional personnel to the cohort investigated in the first phase. In this case factors such as operational urgency and cumulative fatigue can be considered with regard to the physical demands and risk of trade tasks. This serves to maximise the face validity of the research.

In each phase of the observation, technologies are used to both monitor the physiological response of personnel performing the task as well as profiling the characteristics of the task itself. Heart rate monitors and portable oxygen consumption systems have been used to monitor personnel response to the demands of the trade tasks. This information is supplemented by the collection of perceived exertion data from individual personnel. Global positioning systems (GPS) which provide information on route, distance, speed and altitude have been employed to examine the task characteristics. Further considerations relevant to the task, including load carriage requirements, sensory perception data (comfort/discomfort), and ratings of job performance are also

monitored throughout the performance of the trade tasks. To identify and characterise task risk, video data is collected throughout the performance of trade tasks, after which, high risk elements can be selected for concentrated investigation.

Information collected from the maximal physical capacity testing and the two phase trade task field observation are then used collectively to determine the inherent demands of trade tasks both at an individual and cohort level. For instance, the percentage of maximal physical capacity exerted through the performance of each trade task can be evaluated. This then leads to the development of specific and representative physical employment standards for the trade. The outcome of implementing specific and representative physical employment standards for individual trades within the ADF includes reduction in injuries, enhanced performance and safety on the job, increased personnel availability for operations and training, and a reduction in cost of health care and compensation.

Dan Billing is a Human Performance Scientist within the Human Protection and Performance Division (HPPD) of the Defence Science and Technology Organisation (DSTO). Dan's research expertise is in the area of athlete/soldier monitoring and he has recently completed a PhD program in this field with the Australian Institute of Sport (AIS) and the Cooperative Research Centre for MicroTechnology.

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Common Exercise Related Injuries of the Lower Limb

AJ Delaney

Exercise related overuse injuries account for a substantial loss of manpower and capability from recruit schools to Special Forces selection courses. The common conditions can be broadly divided into:

Biomechanical conditions – sesamoiditis, interdigital neuroma, plantar fasciitis, ankle impingement syndromes, tibialis posterior tendonitis, Achilles tendinosis, bone stress syndromes, medial tibial enthesitis, patello-femoral joint syndromes, infrapatellar fat pad impingement and iliotibial friction syndrome.

Neurovascular conditions - lower limb neurovascular syndromes, lumbosacral radicular impingement and exertional compartment syndromes.

The presentation focuses on the optimal use of history, examination and special investigations to rapidly identify, diagnose, treat and rehabilitate personnel presenting with these problems.

COL Tony Delaney is Chair, ADF Consultative Sports/ Rehabilitation Consultative Group and Director Health Services Army Reserve Eastern Region. He was SMO 8 BDE and RMO 1 Commando Regiment. He is a Sports Physician in practice at the Sydney Academy of Sport and a visiting senior specialist at the Fleet Base East Medical Centre, HMAS Kuttabul and 1 Health Services Battalion, Holsworthy. He has a special interest in the environmental extremes of cold, heat, altitude and depth and the biomechanics of overuse injuries.

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Effect of a 12-Week MEAO Deployment on Nutritional/Immune Status and Physical Capabilities

C Booth

Introduction: Human Protection and Performance Division was tasked to determine the extent of potential loss of capability due to impaired nutritional and immune status of ADF personnel engaged in active deployment for 12 weeks in a Middle East Area of Operations. Individual physical capabilities were measured pre- and post-deployment.

Methods: Nutritional and Immune Status – Measurements of body composition and girths were conducted to determine alterations in muscle and fat components, general health and diet questionnaires were completed, saliva and blood samples were taken for measurement of key nutritional indicators (e.g. iron and lipids) and immune function (white cell count, anti-Tetanus toxoid antibody).

Physical Capabilities – Standard methods were used for aerobic fitness ('beep test'), upper-body strength (heaves to exhaustion), and explosive lower-body muscle power (standing vertical jump, SVJ).

Results and Discussion: A total of 33 soldiers (mean age 27 years) completed pre- and post-deployment assessments. Mean body mass and body fat did not significantly alter, but mean waist circumference was increased and lower limb girths decreased. There was a significant decline in the level of the serum protein fibronectin ($p < 0.001$) and self-reported diet was low in carbohydrate. Taken together, these two findings strongly suggest a catabolic state, i.e. body protein was being lost. Immune function did not decline significantly, however there were significantly more reported (minor) illnesses in the final two weeks of deployment than during the pre-deployment period ($p = 0.001$), while diarrhoea was virtually a universal problem while on deployment, and gastric reflux was common. The group experienced a significant drop in aerobic fitness (mean pre-deployment $\text{VO}_{2\text{max}} = 56.6 \pm 1.1 \text{ ml.kg}^{-1}.\text{min}^{-1}$; post-deployment $= 47.2 \pm 1.2 \text{ ml.kg}^{-1}.\text{min}^{-1}$, $p < 0.001$). Mean upper-body muscle strength decreased by 9% (number of heaves completed decreased from 17 ± 1 to 15 ± 1 ; $p < 0.05$), and lower body muscle power significantly declined (mean SVJ height decreased from $61.8 \pm 1.8 \text{ cm}$ to $57.1 \pm 1.4 \text{ cm}$; $p < 0.05$). It is not known if these significant reductions in fitness had an impact on military performance/outcomes. However, it is clear that a decrease in physical conditioning will lead to an increase in cognitive/mental fatigue at the same absolute work intensity. Patrol groups reported a decrease in physical and cognitive performance.

Conclusions: Deployment had a significant impact on nutritional status and physical fitness, leading to an increased physical and psychological burden on troops. Although further research on a larger cohort is required to confirm the present findings, the results of this study suggest that strategies to reduce the adverse impact of deployment on physical fitness and nutritional status of Special Forces soldiers are required, and that interim interventions are warranted. Appropriate interventions will be discussed in the presentation.

Christine graduated from the University of Qld with BSc

(Hons) and PhD (1992) in biochemistry--(enzymology) vitamins & co-factors. She has also obtained qualifications in education (Dip Ed, UQ) and dietetics (Grad Dip Nutr Diet QUT). Christine has held research positions within UQ and QUT and a supervising scientist position within Chemical Pathology at the Royal Brisbane Hospital. Currently she works as a research scientist and nutrition task manager for the Defence Science & Technology Organisation in Scottsdale Tasmania and is an Honorary Research Associate within the University of Tasmania's School of Human Life Sciences. As a researcher with the Human Protection and Performance Division she has been investigating the nutritional status of soldiers and the effects of extreme climates and long-term combat rationing on health and military performance.

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Ethical Issues in Healthcare Whistleblowing

T Hoffman

Patient advocacy and the need for urgent action resulted in 'whistleblowing' to stop a surgeon from operating at Bundaberg Base Hospital. This surgeon, Dr Jayant Patel, was found to have a 20 year history in the US of negligence, falsification of patient records, and poor interpersonal skills. Dr Patel had worked at Bundaberg Base Hospital for two years. After Dr Patel had been in Australia for six weeks, staff had attempted to notify the hospital hierarchy of their concerns about infection rates and wound closure problems in Dr Patel's patients, and about his behavior and other issues. Subsequent complaints were disregarded. Finally, out of desperation, a complaint was made to a state Member of Parliament who spoke about it to the Queensland Parliament. Mainly because of the management style of a particular executive and the issues surrounding Dr Patel, the complaints continued, and what is probably the worst example of medical malpractice was finally exposed. The problems were shown to be perpetuated by peripheral issues such as "budgets and funding models based on elective surgical productivity". In this presentation, the issues surrounding whistleblowing and the consequences of this will be discussed by the Nurse involved in the whistleblowing, Toni Hoffman. There will also be some reflection on the ethics education of health professionals, in light of the events at Bundaberg Hospital.

Toni Hoffman is the Nurse Unit Manager at Bundaberg Base Hospital. She has been a nurse since she started her "training" in 1976, at Princess Alexandra Hospital in Brisbane. In 2003, she found herself in a situation which resulted in the Royal Commission looking at the issues surrounding the employment of Dr Patel. Toni Hoffman was the whistleblower who drew attention to the surgeon who was responsible for multiple deaths and injuries to patients at Bundaberg Base Hospital. He had a twenty year history of negligence and malpractice in the states. Toni Hoffman is this years "Australian of the Year – Local Hero". She has also been awarded the "Whistleblower of the Year" award. Her journey this year has seen her, amongst many things have dinner with the Queen.

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Privacy of Health Information in the ADF

JA Ross*, R Landy

The privacy of Health information is a sensitive issue, which has further layers of complexity in Defence. Different approaches to what is acceptable use of personal health information have developed over the years in the three Services. The lack of specific policy has resulted in uncertainty and inconsistency. Defence has chosen to comply with the Privacy Act (1988) (Cth) and its Individual Privacy Principles (IPPs) and National Privacy Principles (NPPs). Two incidents occurred where there was public release of medical in confidence information.

Defence should in general be seen as no different from any other employer, but there are a number of unique factors that make privacy more problematic. This includes the Commander's responsibility for welfare, concern about security, the 24/7 nature of Service, and the collection of psychological and administrative data as well as health data, for the purposes of providing documentary evidence of the preparedness of an individual, from a health perspective, for military operations.

A new policy was developed for the use of health information in Defence. This specified the intended uses of health information in Defence, and exceptions where information can be used without obtaining specific consent. Health Information can be used where its use is consistent with the intent for which the information was collected, and where the individual should reasonably expect that the information would be used in this way. Where these criteria are not met, informed consent of the individual concerned is required for the use of the information. Exceptions to this guidance are permissible in very specific circumstances.

The information that can be released as a matter of routine has been defined, being that related to the impact of any condition on the employment and deployment of the individual concerned. However, a specific health diagnosis is not to be released without consent unless its non-release could result in a serious or imminent threat to the life, health, or safety, of an individual or others.

The policy represents a change in culture, particularly amongst some Commanders. While the single-Services have accepted the policy, a program of education of members, Commanders and health personnel is still needed.

This presentation provides a forum to discuss the issues around privacy of health information in Defence.

GPCAPT James Ross is the Director of Operational and Preventive Health at Defence Health Services Division. He is an Occupational and Public Health Physician with experience in clinical, command and policy roles. He is an Associate Professor at UQ and University of South Australia Dr Rosemary Landy is the Staff Officer Clinical Dental Standards and Executive Secretary of ADHREC. She has a long involvement with ethical and privacy matters and was the desk officer for the health information privacy DI.

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“More in the Breach than the Observance” A reflection, or more to the point, an interpretation of the applicability of the Geneva Conventions in regard to health personnel during AMTG 2

G Villani

In light of such abuses as Abu Ghraib and the British treatment of Iraqi teenagers and other detainees in Basra, it is important for Australia as another member of the 'coalition of the willing' to pay particular attention as to what it does in Iraq and how it goes and is seen to go about its business. It is important to seek and hold the high moral ground.

What are Australia's responsibilities in regard to these whilst deployed to Iraq and indeed Afghanistan?

Australia is a signatory to the Geneva Conventions and these have been ratified by Acts of the Australian Parliament. As a signatory we are obliged to abide by the Conventions and Additional Protocols, even if other belligerent second or third party nations and/or peoples are not signatories.

The Geneva Conventions are now binding and it is generally accepted that their fundamental provisions have the force of custom (my italics) and are therefore binding on the whole international community (ADFP 53 Health Support, 1998, Chapter 10 Medical Aspects of the Law of Armed Conflict, para 10.9.) The Law of Armed Conflict (LOAC), as defined by the Geneva Conventions and the Additional Protocols, provides specific rights and obligations for medical personnel.

The "LOAC has an immediate and practical relevance to the provision of health support in operations. The Australian Defence Force is required to adhere to international conventions which have been ratified by the Australian Government"(ADFP 53 Chapter 10, para 10.1.) In preparing for a deployment to an area of conflict there are certain obligations in relation to the identification of Protected Personnel that must be undertaken and an understanding of how within this area of conflict Protected Personnel are to be employed.

My presentation looks at a recent Operational experience and seeks to provoke discussion about these matters.

CAPT Villani is an Army Nursing Officer currently posted to 2 HSB in Brisbane. He returned from operational service in southern Iraq with AMTG2 in June this year.

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Risk Management in an Increasingly Litigious Environment - Implications for Defence

P Alexander

As a medico legal / incident manager for a major Australian Medical indemnity Organisation, it is noticeable that there has been an increase in litigation and negligence matters arising in all states as well as a marked increase in matters reported to Health Complaints Commissions and Medical Boards. These matters relate to all matters in practice and Defence Practitioners, whilst not greatly affected at present, need to be aware of these changes and adjust practice principles if required.

I will highlight some of the areas where the changes have occurred and discuss the implications for practitioners in general as well as exploring some possible vulnerability in Defence.

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Deployment, Research and Ethics, What is the Relationship?

DL Harding

This paper will explore the relationship between research and ethics in relation to ADF Health deployments. Issues examined will include; the need for informed consent, the relationship between the researcher and those receiving humanitarian aid (HA), who owns the 'data', the appropriate use of that data, the use of images, the adherence to standards and the deviation from normal clinical practice in HA situations. This paper will be primarily from a theatre perspective. The discourse following deployments is primarily by papers published in journals and presentations at conferences and meetings. These are based on data and images gained on the deployment. This paper is intended to stimulate discussion on the topic.

CAPT Don Harding is a Perioperative Nursing Officer in 1st Health Support Battalion at Holsworthy. CAPT Harding has been on deployments to Bougainville, East Timor, and Banda Aceh. CAPT Harding trained in Canada and has worked in Canada, Saudi Arabia, the USA and Australia.

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Ethical Issues for Researchers in Defence Health

G Shirtley*, R Landy, J Morrison, G Cannell

Introduction. The Australian Defence Health Research Ethics Committee was established in 1989 to examine and comment on ethical issues in Defence health and to consider research protocols involving humans in Defence. Since this beginning the scope, challenges and ethical questions confronting Defence have dramatically increased. The unique environment of Defence presents particular challenges not only for researchers but for those required to review and approve proposed research proposals. In this presentation these changes and the expanded role, functions and workload of ADHREC will be presented.

Methods. In 2005/06, the National Health and Medical Research Council issued for discussion the Draft National Ethics Application Form (NEAF). The purpose was to produce a standard template that addressed all of the issues required to be considered in the design of a research project and the development of a research protocol. The ultimate goal was to provide a template not only for researchers but for those required to review the ethical implications of a research proposal. The NEAF formed the basis for a review of the current ADHREC procedures for submission and ethical evaluation of proposed research protocols. Careful consideration was given to the nature of the information required and the process of review to be undertaken by a Human Research Ethics Committee in the current medical and ethical environment in Australia and internationally. ADHREC provided guidance on issues of specific concern to Defence health. The procedures were then benchmarked against best practice in other Australian research institutions.

Results. Drawing upon the NEAF procedures and taking into consideration the NHMRC National Statement on Ethical Conduct in Research involving Humans, the following sections relating to ADHREC submissions were defined:

- Ethical considerations related to the project, benefits and risks, Defence, participants, information collection and storage, indemnity and compensation, ownership and sponsorship, and privacy and publication.

Each section was considered so that all relevant questions were addressed. This resulted in a draft self-contained set of questions (guide) for preparation, submission, and evaluation of the ethical implications of research proposals involving humans to be undertaken in the Defence environment.

Discussion. Defence has specific challenges related to the dependant nature of Defence relationships (colloquially called the “captive audience” concept) and the particular challenge of informed consent as defined in the core documents of ethical human research – the Nuremburg Code, the Declaration of Helsinki, and the Belmont Report. Other issues of particular concern to ADHREC include the quantitation of potential risks (to participants and others) and anticipated benefits (if any) to Defence, statistical power and sample size required and use of appropriate controls. The roles and functions of ADHREC will be discussed in relation to human research within Defence; in particular this will provide an opportunity for researchers and potential researchers to gain an insight into ethical issues, protocols and their application. Fundamentally, bad ethics is bad science, and bad science is bad ethics.

Rear Admiral Shirtley graduated in medicine from the University of New South Wales in 1974 and then completed a specialty qualification in radiology. From this time he has been in private practice in Sydney. Rear Admiral Shirtley joined the Royal Australian Navy in 1974 with a variety of postings in Australia and four attachments to National Naval Medical Center in Bethesda where he holds an adjunct professorial appointment. He is currently Surgeon General of the Australian Defence Force and Chairman of ADHREC, the Australian Defence Human Research Ethics Committee.

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POSTER PRESENTATION

Dietetic Challenges in the Defence Force

D Moore

There are many dietetic challenges in the Australian Defence Force (ADF) in the twenty-first century. This paper will describe current dietetic roles and outline future possibilities.

The importance of food and nutrition to military forces worldwide has been recognised for many years. In the past, deficiency diseases had a severe impact on military and naval forces. Provision of an adequate variety and quantity of food has been a significant logistical challenge for Australian forces, from colonial times to the present. The ability of the military organisation to feed its members in a timely and nutritious fashion contributes to the good health of personnel and is consequently a force multiplier. The provision of fresh food is preferred, when possible. Combat Ration Packs will be issued when dictated by operational requirements.

Civilian dietitians provide clinical dietetic services to many Defence establishments. Some have additional roles such as nutrition education of groups of Service personnel and nutrition consultancy to the base catering teams, which will be civilian or military. A senior dietitian is part of the nutrition research team at DSTO Scottsdale. A small number of dietitians are Reserve members. Current Reserve roles include project consultancy, for example to Defence Health in Canberra and nutrition training, including postgraduate courses at the ADF School of Catering and various courses at the ADF Physical Training School.

Dietitians contribute to the health and fitness of ADF personnel in a number of ways, including clinical advice to individuals, group nutrition education, consultancy and training services to catering sections, plus nutrition research projects that have direct application to Service personnel. Such projects include the determination of nutritional adequacy of recruits' usual diets before commencement of training, determination of energy needs during training, assessment of nutritional status and fatigue among such recruits and the comparison of fresh food versus Combat Ration Packs on the nutritional status of military personnel.

There are opportunities for an increased dietetic presence in the ADF. It is important that the existing tasks such as the clinical dietetic functions, DSTO research and current Reserve responsibilities continue. Recruitment of more dietitians onto the Reserve would enable a wider range of tasking to be addressed. For example, the possible recruitment of acute care dietitians, some with paediatric expertise, to work in humanitarian assistance roles and the utilisation of critical care dietitians in deployed military hospitals.

There would be a requirement for dietitians to advise on influenza-specific menus for ADF personnel, in the event of an influenza pandemic. It is important to appreciate that such a pandemic will be very likely to cause losses of at least 50% of catering and health services staff and that normal meal

production and service may not be possible. Involvement of Reserve dietitians in contingency planning for such emergencies and their management will be important

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Soft Tissue Injury Does Not Reduce the Effectiveness of Recombinant Activated Factor VII (rFVIIa) to Improve Survival in Incompressible Haemorrhage

SA Watts*, M Green, C Parry, G Lawton, N Martin, E Kirkman

Haemorrhage is the leading cause of battlefield deaths and the second leading cause of early death in civilian trauma. A recent prospective randomised clinical trial concluded that intravenous administration of rFVIIa, a clotting factor, was safe and reduced blood loss in trauma victims [1]. We have recently shown that rFVIIa can increase survival time within a clinically relevant range using a model of incompressible truncal haemorrhage in terminally anaesthetised pigs [2, 3]. Military injury is often associated with gross tissue damage, especially to the periphery, in addition to haemorrhage. Tissue injury will expose tissue factor (a binding site for rFVIIa) that may act as a sink for rFVIIa, and hence reduce the effectiveness of rFVIIa to staunch uncontrolled truncal bleeding. The aim of this study was to determine the effects of soft tissue injury on the effectiveness of rFVIIa to increase survival time after the onset of incompressible arterial haemorrhage.

A prospective randomised controlled trial was conducted in terminally anaesthetised (alphadolone/alphaxolone) Large White pigs (41-50 kg body weight). All animals were splenectomised, the bladder cannulated and a steel wire placed in the infra-renal aorta via a laparotomy and the abdomen closed in a watertight manner. Animals were divided into 3 groups: Groups 1 & 2 (n= 6 and 8, respectively) received a ballistic injury causing extensive soft tissue damage in the hind limb without major blood loss, while Group 3 (n=8) received no ballistic injury. All animals were then given a controlled haemorrhage of 30% total estimated blood volume via a femoral arterial cannula followed by a 4-5 mm aortotomy using the pre-implanted steel wire to allow uncontrolled incompressible blood loss. After a 5 min shock period the animals were either given rFVIIa (180 µg/kg i.v., Groups 1 and 3) or an equivalent volume of saline (placebo, 0.3 ml/kg i.v., Group 2). Fluid resuscitation was then commenced with Hartmann's solution (3 ml/kg/min) until a systolic arterial blood pressure (SBP) of 80 mmHg was attained. Fluid infusion was then stopped and additional boli subsequently

given at the same rate to maintain a SBP of 80 mmHg. The primary endpoint of the study was survival time to a maximum of 6 h after the onset of resuscitation. All surviving animals were killed humanely with an overdose of anaesthetic. A value of $P < 0.05$ was considered statistically significant.

Survival time was significantly longer in animals given ballistic injury and treated with rFVIIa compared to placebo (237[34-360] vs 51[27-79] min respectively in Groups 1 and 2, median[95% confidence interval]) ($P = 0.026$, Peto's log rank test). By contrast there was no significant difference in survival time between ballistic-injured (Group 1) and sham-injured (Group 3; 131[31-360] min) animals treated with rFVIIa ($P = 0.584$).

These results indicate that the survival benefit of a single dose of rFVIIa (180 mug/kg) is not reduced by the presence of significant tissue injury in a severe model of incompressible haemorrhage.

Dr Sarah Watts is a veterinary surgeon who has worked at Dstl for 6 years and has worked within Surgical Science team for 3 years. The Surgical Science team is currently investigating resuscitation strategies to reduce early combat casualty deaths.

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Optimising the Utility of Defence Injury Surveillance Systems

A McKinnon

Injury surveillance systems are, at their most basic, a framework. It is through the introduction of human contributors that surveillance systems become working processes that lead to the implementation of injury prevention initiatives. However, the vast majority of research on injury surveillance systems has focused on the technical design and evaluation of these systems, whilst disregarding the importance of the human components that make these systems function. The aim of the current research was to explore the past experiences and current requirements of users of the injury surveillance systems of the Defence Injury Prevention Program (DIPP), in a bid to optimise the utility of the systems to guide injury prevention activities. A Grounded Theory approach was utilised for the qualitative investigation, incorporating semi-structured interviews performed with individuals involved in the injury surveillance component of the DIPP, at three levels: 1) the ongoing, systematic data collection, 2) the analysis and interpretation of data collected, and 3) the dissemination of data analyses and/or interpretations. Thematic interpretation of the results are provided, as are recommendations for the operation of injury surveillance systems within the Australian Defence Force.

Adam McKinnon is currently undertaking a PhD with Monash University's Accident Research Centre on injury surveillance systems. Adam has an academic background in Psychology and Information Technology and has worked in research positions within Defence as both an Army officer and public servant.

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Military Load Carriage Research: Improving Soldier Performance and Minimizing Injury Risk

RL Atwells*, MA Jaffrey, DC Billing, D Crameri

Introduction: The core elements of the dismounted soldier's Load Carriage System (LCS) consist of webbing, backpack, combat body armour, weapon, footwear and clothing. The ability to carry a load is dependent on many factors governed by the individual's physical capability, their response to environmental stresses and strains (e.g. terrain, distance, temperature and gradient), and the load mass they carry. Due to the complex nature of load carriage a myriad of evaluation techniques have been utilised. **Human Performance Research** addresses skeletal movement, muscle activity and physiological response to differing environments. **LCS R&D** addresses functional design and integration of system components, the human interface, and overall ergonomic considerations. This paper outlines some of the evaluation techniques and capabilities currently being used by the HPPD within DSTO to improve operational performance and reduce injuries.

Programmes of work: Human Performance Research: In-the-field measurement of soldiers' workloads using heart rate monitors, core temperature pills and GPS have allowed modelling of human performance under different environmental stresses. A portable oxygen analysis system (Metamax™) has been incorporated into some trials to validate energy expenditure/oxygen cost prediction tables. This type of evaluation allows research to be carried out within normal operational activities. Laboratory research is concentrating on the skeletal and muscular response of the soldier, with particular interest on the role played by abdominal and back muscles in supporting the load. Using a motion analysis system (Vicon™), 3-D coordination patterns between the trunk, pelvis and lower limb have been observed over 2 hours of continuous load carriage, with associated muscle activity examined using an electromyography system (Noraxon™). **LCS R&D:** Recently, HPPD has assisted DMO and the Land 125 PO with anthropometric surveys of infantry soldiers and field trials of the LCS currently being rolled out to the infantry battalions.

Results: Human Performance Research: Environmental stresses: Work rest guidelines have been produced in order to minimise the risk of heat stress illness whilst carrying loads. Validation of predicted oxygen cost whilst load carrying is currently being completed. Muscular and skeletal response: Initial results indicate load carriage disrupts the normal pelvis to trunk coordination. An increased forward lean and head position places more stress on the thoracic and lumbar spine, implying that improved core muscular strength may decrease injuries. **LCS R&D:** Recent recommendations influenced shoulder strap design, ALICE frame lengths and chest webbing size to cater better for the smaller soldier. Work is planned to assess LCS-human interface, comfort, fit and load distribution parameters for new shoulder strap and hip belt designs, using

specialised pressure distribution sensors/instrumentation.

Conclusion: The capabilities and results being produced by HPPD will lead to improved soldier load carriage capability and reduced musculoskeletal injury risk. Future LCS R&D will focus on designing a fully-integrated, hip-loaded LCS and assessing the shock absorption, fit and comfort properties of military footwear.

Renee Attwells is a member of the Human Performance arm within the Human Protection and Performance Division of DSTO. Her background is in Exercise Science, with a PhD examining ergonomic issues related to load carriage equipment used in the United Kingdom. Renee joined DSTO in January 2006.

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Management of Low Back Pain

A J Delaney

Low back pain syndromes cause an unquantified cost in manpower, capability, efficiency and finances within and outside the ADF.

The experiences with tertiary referrals to the sports medicine clinics at IHSB and FBEMC are used to optimise the diagnosis and management of ADF members with low back pain. An algorithm for differentiation of discogenic, zygo-apophyseal joint, "mechanical" back pain and "red flag" conditions is presented. The current evidence based use of investigations, exercise, biomechanics, physiotherapy, pharmacology, selective CT guided injections and surgery in management of low back pain syndromes is summarised.

COL Tony Delaney is Chair, ADF Consultative Sports/ Rehabilitation Consultative Group and Director Health Services Army Reserve Eastern Region. He was SMO 8 BDE and RMO 1 Commando Regiment. He is a Sports Physician in practice at the Sydney Academy of Sport and a visiting senior specialist at the Fleet Base East Medical Centre, HMAS Kuttabul and 1 Health Services Battalion, Holsworthy. He has a special interest in the environmental extremes of cold, heat, altitude and depth and the biomechanics of overuse injuries.

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Do We Need Paediatricians in the ADF Health Service? Four Years Experience of Providing Medical Support to the Australian Army Cadet Corps Annual Camp

GF Gill

The Australian Defence Force Cadets (ADFC) is a youth development organization supported in partnership by Defence and the community. Under legislation the Service Chiefs have responsibility for ensuring all practicable steps are taken to protect the health and safety of cadets and cadet staff. Cadets and cadet staff are not members of the Australian Defence Forces.

Twenty per cent of all ADF members either full or part time were members of the ADFC. ADF personnel who were former ADF cadets have been shown to serve in the ADF for longer periods than members who were not. The ADFC is therefore an important aspect of ADF recruitment and retention strategies.

This presentation presents my experiences over four years of the health problems of the AACC presenting at their annual camp in Tasmania. My experiences have led me to believe that there are significant health risks presented by both cadets and their staff. Better support both in medical logistics, ADF health service support personnel numbers and the training of both cadets and their staff are required.

Because cadets are not adults, I believe a case exists for recruiting paediatricians with an interest in adolescent medicine to provide advice to the ADF on a range of matters. There is also a need to consider providing age specific resuscitation equipment such as masks and endotracheal tubes.

The ADF needs to consider if its policies on matters such as heat illness prevention and treatment, physical activity and obesity, and smoking tobacco should also include sections specifically addressing the needs of the ADFC.

Lt Col Gerard Gill is the Director Health Services Army Reserve in Tasmania. He is a general practitioner in Launceston and has been a member of the Army Reserve since 1982. He is the Secretary of the RACGP Military Medicine Chapter and has just submitted his PhD thesis at the University of Tasmania.

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