

JMVH

Volume 17 Number 4

October 2009

Journal of Military and Veterans' Health



- Postgraduate education for health professionals working in Defence
- Airway management: Shining a new light
- General Practice training in the ADF

The Journal of the Australian Military Medicine Association





AMMA MEMBERSHIP

Become an AMMA Member and receive a welcome gift and certificate plus receive the *Journal of Military and Veterans' Health* quarterly.

To become an AMMA Member contact the AMMA Secretariat:

P: 03 6234 7844

E: secretariat@amma.asn.au

www.amma.asn.au

Table of Contents

Editorial

Inside this edition	3
President's Message	4
Postgraduate education for health professionals working in Defence <i>Peter Leggat, Peter Aitken, Isaac Seidl</i>	5

Original Papers

Airway management: Shining a new light <i>Benjamin Berg, Dale Vincent, Ben Boedeker</i>	9
What's new above the cords? Simulation based education for supraglottic airway management <i>Benjamin Berg, Dale Vincent, Ben Boedeker</i>	11
General Practice training in the ADF-square peg, round hole? <i>Scott Kitchener</i>	13
Evolving mechanisms and patterns of blast injury and the challenges for military first responders <i>Charles Stevenson</i>	17
Physician Assistants in the military <i>Allan Forde, Dennis Pashen</i>	22

Book Reviews

Examination Intensive Care and Anaesthesia: Guide to Intensivist and Anaesthetist Training <i>Nikki Blackwell, Carole Foot, Christopher Thomas</i>	25
Therapeutic Guidelines: Dermatology <i>Nikki Blackwell, Carole Foot, Christopher Thomas</i>	26

Australian Military Medicine Association News

Queens Birthday Honours	28
-------------------------------	----

Instructions to authors	29
-------------------------------	----

Copyright policy	37
------------------------	----

Journal of Military and Veterans' Health

EDITORIAL BOARD

Dr Russell Schedlich (Editor in Chief)
Assoc. Prof. Scott Kitchener (Managing Editor)
Dr Graeme Cannell
Dr Peter Leggat
Prof Malcolm Sim
Dr Bob Stacy

Australian Military Medicine Association

PATRON

MAJOR GENERAL Paul Alexander
Surgeon General
Australian Defence Force

COUNCIL

President	Russell Schedlich
Vice President	Nader Abou-Seif
Secretary	Janet Scott
Treasurer	Neil Westphalen
Council Members	Kerry Clifford Greg Mahoney Andrew Robertson Geoff Robinson
Public Officer	Paula Leishman

JMVH INTERNATIONAL ADVISORY COMMITTEE

BRIGGEN Dr Mohd Zin Bin Bidin, Malaysia	RADM (Dr) Wong Chee Meng John, Singapore
Dr Nick Blatchley, United Kingdom	SGN Pierre Morissette, Canada
Prof Kenneth Boffard, South Africa	Dr Dave Pedlar, Canada
BRIG Anne Campbell, New Zealand	LT GEN Dr Vejaynand Indurith Ramlakan, South Africa
Prof Mary Chiarella, Australia	SURG CDR Jane Risdall RN, United Kingdom
Prof Mark Creamer, Australia	CAPT Art Smith USNR, USA
Prof Annette Dobson, Australia	Dr Tyler Smith, USA
CDRE Mike Dowsett, Australia	LTCOL Frank Torova, Papua New Guinea
Prof Gregory Gray, USA	Dr Katherine Venables, United Kingdom
Dr Craig Hyams, USA	Prof Simon Wessely, United Kingdom
Dr Han Kang, USA	

STATEMENT OF OBJECTIVES

The Australian Military 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.

Inside this edition

This edition of JMVH focuses on training within the Defence environment.

Contributions are international and of international standard.

The edition begins with an overall paper by Leggat, Aitken and Seidl regarding the context of postgraduate education for health professionals in the Defence environment. This places the background for the more specific papers regarding important though more narrow aspects of Defence Health Service training. The paper does include several very salient and specific points despite the broad view. Particularly it is a risk to only consider clinical training for Defence health professionals. Leggat et al point out the mistake in this with respect to the common circumstance of health operations under command of general military officers with minimal preparation for clinical governance, health care ethics and law, health economics and direct medical management.

Other key points in Defence health training discussed in this paper are the importance of utilizing flexible modes of teaching and simulation which are explored further in papers of this edition. Finally, the importance of civilian-military training is introduced with the potential conflicts and benefits of mutual understanding which are discussed in specific situations by other papers. The overlap between extensive civilian practice in this area is valuable to be passed onto military practice. A similar area of overlap between civilian and military training and roles is illustrated in the emerging area of Physician Assistants contributed by Allan Forde and Dennis Pashen from James Cook University where PAs are currently in training.

Continuing the training theme of this edition is a paper furthering the discussion of civilian-military interaction for General Practice training of Medical Officers. To be deployable with the ADF, Medical Officers are required to complete military and military health training in addition to undergraduate and postgraduate civilian training. To be deployable unsupervised, ADF MO must reach Competency

Level 3 which requires completion of Fellowship in the Royal Australian College of General Practitioners or the Australian College of Rural and Remote Medicine. Typically this training is undertaken in the first few years after graduation when the military training requirements are also high. Coordinating these can be a challenge.

The Journal of Military and Veterans Health is pleased to have received and publish a paper by CPLC. Stevenson discussing blast injuries, particularly those from improvised explosive devices. This is a well written and timely paper regarding core business of many military health professionals today.

Book reviews this edition will be of interest to those in military practice including a review of the Guide to Intensivist and Anaesthetist Training, and the next in the popular Therapeutic Guidelines series, on Dermatology.

Of course for those now inspired by the Journal, the Instructions for Authors are provided. The Editorial team including myself are available to advise on any possible contributions you feel may be of interest to the readers of the Journal of Military and Veterans Health from short communications or Letters to the Editor on operational experiences, to case studies or series of clinical note in military practice, or original articles of clinical relevance to military health practitioners.

Thank you for your continued support of the Journal of Military and Veterans Health.

Good reading.

Scott Kitchener
Managing Editor

President's Message

As I write this message, Australia is in its sixth month of responding to the threat of the Pandemic (H1N1) 2009 influenza virus. This has been an extensive test of our ability to respond to a nationwide threat from an infective agent.

The pandemic has evolved in a way that has been different to that predicted. This has been fortunate and has also demanded innovation.

Fortunate, because the strain has so far not been as virulent as might have been expected (although a significant number of Australians have still died as a result of the disease). Innovation, because a whole new phase for the Australian pandemic response needed to be developed quickly once the nature of the disease had been identified.

Of course, the impact has still been significant. In addition to the deaths, large numbers of patients have been admitted to Intensive Care Units across the country, requiring additional resources and also the rapid establishment and expansion of new technologies – such as extracorporeal membrane oxygenation.

The vaccination programme is now being rolled out, and the success of this may well affect the risk and impact of a second wave of the pandemic. The lessons of history remain with us – the second wave of the 1918 “Spanish” flu pandemic was significantly worse than the first, and we must hope that this is not the case at this time.

Not only have the deliverers of health care been impacted by this pandemic. All of the jurisdictions have established disaster management organisations to support and coordinate their responses. The next step will be to learn the lessons from the response and prepare structures and processes to facilitate future responses.

As if the pandemic has not been enough, nature has recently struck again in our region, with earthquakes in the Pacific and the Indonesian archipelago.

The earthquake in the Pacific Ocean resulted in a tsunami that devastated the southern coasts of Samoa and American Samoa, as well Niuatoputapu, one of the outlying islands of Tonga. The numbers of dead were small in world terms (about 150 in Samoa and nine in Niuatoputapu), but for these island nations the proportionate impact on their communities is huge.

Tonga has been further impacted by the sinking in August of the country's inter-island ferry: not only did this result in the loss of over 90 people (mostly women and children), but there is now no regular supply service to the outlying islands.

In Indonesia another earthquake, only a few days after the Pacific event, has resulted in devastation (but fortunately no tsunami) off the south coast of Sumatra. The death toll – over a thousand – and infrastructure damage has been extensive, and much rebuilding is required.

Australia has responded to both of these disasters, with civilian medical teams being despatched to provide initial assistance, assessment and support to local services. Additionally, HMAS Kanimbla, with its logistic support and medical capabilities, has been sent to Sumatra.

These various aspects of disaster response have their principles and practices founded in the mass casualty and disaster principles that are fundamental to military health support. The people that have been involved in all these responses – both the clinical teams deployed and the management teams coordinating responses – have included significant representation from both the Permanent and Reserve Defence Health Services.

That the skills and expertise that those in the military health services gain are easily translatable to these scenarios is a credit not only to the individuals but to the Defence Health Services organisation that has trained and nurtured them.

And the contribution of the Association to providing a forum for the exchange and development of professional knowledge and understanding of the science and practice of these skills must also not be underestimated.

Russ Schedlich
President

Postgraduate education for health professionals working in Defence

Peter Leggat, MD, PhD DrPH, FAFPHM, FACTM, Peter Aitken MBBS, EMDM, FACEM, and Isaac Seidl MBBS, MHA, GradDipStrat, FRACGP, FRACMA, psc(j),

In 2007-2008, Defence Health Service (DHS) personnel and the growing band of contracted health providers cared for 53,140 permanent Australian Defence Force (ADF) members and 24,885 reserve ADF members¹, not including the initial care of families accompanying members deployed abroad and other eligible civilians. Health providers in the Defence setting include medical assistants with various levels of advanced training as well as health professionals, predominantly medical practitioners and nurses, but also some other health disciplines, such as pharmacists, physiotherapists and health administrators. DHS personnel and contracted health providers require various levels of training to operate in different postings and sites within Australia and overseas. This training is usually done through a combination of in-house courses and through various programs of external educational institutions.

While some countries enjoy the benefits of a dedicated university for military health, such as the Uniformed Services University of the Health Sciences in the United States², many countries now have dedicated military and/or veterans' health academic programs in partnership with existing university structures. The Centre for Military and Veterans' Health (CMVH) with various University nodes across Australia is a good example of this (see Table 1). The CMVH has a dedicated Master of Public Health (in Military Health) as part of its offerings.

University	Website*
University of Queensland	http://www.uq.edu.au/cmvh/
University of Adelaide	http://health.adelaide.edu.au/school_phcp/cmvh/
Charles Darwin University	http://www.cdu.edu.au/gshp/cmvh/

* All URLs accessed 25 July 2009

Table 1. Australian Nodes of the Centre for Military and Veterans' Health

These initiatives are also a good illustration of the development of cross-service training and education programs, where military health programs will most likely continue to invest. In addition to programs offered by the CMVH, there remains a network of universities and professional organisations that will

continue to provide the bulk of postgraduate training of health professionals working within Defence.

Future ADF and civilian health education and training will necessarily be closely tied to the relevance they have to core Defence business and deployments. Training and experience of ADF health personnel in some of the key specialties with direct relevance to combat casualty care, such as emergency medicine, general surgery, orthopaedics, anaesthesiology and intensive care, will continue to be required³⁻⁵. Other specialties such as tropical medicine⁶, public health, aeromedical retrieval, underwater medicine, medical administration and psychiatry will also continue to find relevance in military deployments, whether for combat or humanitarian purposes. For humanitarian missions, the range of specialty areas required expands tremendously as well as involving some level of disaster health management training^{3-5,7}. Pre-deployment specialty education and training will continue to focus on preventive health, occupational health, injury prevention and chronic disease prevention and management. Post-deployment, there will be a continuing need for expertise in areas such post-deployment health, mental health and rehabilitation. Civilian specialists continue to contribute greatly to pre- and post-deployment health, but are playing an increasing role in contracted health services abroad in military areas of operations. Indeed, there remains a heavy reliance on civilian specialists in their reserve capacity for deployments abroad.

Health operations are increasingly being led by generalist military officers, both of medical staff streams (such as general service officers in the Royal Australian Army Medical Corps) and logistic streams. There is little to prepare these officers for the challenges of true health management, particularly in the areas of clinical governance, health care ethics and law, health economics and indeed, the mystical medical hierarchy (which transcends military rank structures). Many such officers undertake postgraduate training in health management and this is to be commended. However, until such training is given advanced standing or at least some recognition towards the Australian Command and Staff College qualification, health professional officers will continue to tread the usual path and forsake the optional paths. Conversely, it is essential that health

professionals have a broader understanding of the strategic environment in which they will operate, in order to contribute effectively to the military centre of gravity. Such an imperative is difficult to address within the current suite of courses that health professionals (particularly reserve specialists) attend, and might be addressed by continuing professional development, perhaps through an online discussion forum under the auspices of either a military or a tertiary educational institution.

The teaching-learning and training environment of today is markedly different from that of 15-20 years ago. The delivery of military programs today enjoys the benefits of web-based and distance learning⁸, as well as block mode teaching, where required. This is especially useful for uniformed personnel when posted around Australia and overseas. The availability of short courses, such as the Early Management of Severe Trauma (EMST) course, as well as improved technology for producing simulations, has enhanced many facets of military and military medical training, which could not simply be obtained from direct patient care⁹. In addition to educational simulations not involving computer technology, such as table top disaster exercises and more complex systems, such as the Emergo Train System,^{10, 11} there are various categories of medical simulation using technology, which include personal computer-based multimedia, digital mannequins, virtual workbenches and total immersion virtual reality,¹² providing for a relatively risk-free teaching-learning environment for a spectrum of medical skills training ranging from first aid through to advanced trauma surgery.¹² As well-summarised by De Lorenzo, "An optimal training

environment benefits from all strategies used, in combination or separately".⁹ (p824)

Aside from the whiz-bang gadgetry outlined above, there is also a role for more cognitive simulation. The complexity of ethical challenges for the military physician has been well described recently with the challenges of Abu Ghraib and Guantanamo Bay.¹³⁻¹⁵ Training for military medical professionals must include the opportunity to discuss (even, 'war-game') how to approach such challenges in a non-deployed environment, a kind of pre-inoculation where mistakes are not fatal (much like a range shoot on a simulation system). The university sector, which encourages debate and discussion, favours this over the hierarchical military environment.

In recent years, it has been recognised that training opportunities in Defence must be closely aligned to critical civilian milestones at postgraduate level, in addition to providing operational military and military medical training. This is overtly demonstrated by the implementation of the Medical Officer Career and Salary Structure,¹⁶ where Competency Levels are attained by uniformed medical officers and assessed by a Medical Officer Professional Career Development Committee against the established criteria (see Table 2). None-the-less, the seniority and posting structure within Defence, as well as perceived differences in comparative professional and other rewards, has been restrictive in retaining both uniformed and civilian health professionals. It is important that continuing efforts are made to ensure that clinical roles can be preserved for senior health professionals in Defence in addition to administrative postings, especially for uniformed personnel.¹

Competency Level (CL)	Operational Capacity	Examples of Training Required
CL1	Directly Supervised	Residency training
CL2	Remotely supervised/ deployable	Military training; military medical training, medical training (incl. EMST); additional training
CL3	Unsupervised/Supervisor, Primary Health Care	Military training; military medical training, medical training (e.g. specialties such as general practice or rural and remote medicine)
CL4	Unsupervised/Supervisor, Force Protection	Military training; military medical training, medical training (e.g. normally specialty training in areas such as occupational medicine, public health medicine, tropical medicine, medical administration, sports medicine)
CL5	Unsupervised/Supervisor, Procedural Specialist	Military training; military medical training, medical training (not clear, but possibly procedural specialties, e.g. surgery, emergency medicine, anaesthetics and related specialties)

Table 2. Competency Levels, Operational Capability and Examples of Training Required¹¹

Improved linkages between civil and military training of health professionals also has much to offer in terms of health services support for both sectors. Two strong illustrations of this are disaster response/humanitarian aid and trauma care/ aeromedical retrieval.

Humanitarian issues are likely to be a component in the early phases of any operation.¹⁸ The services needed during humanitarian intervention are different, with a primary care focus consisting primarily of women and children,^{18, 21} rather than battlefield care. From the civilian perspective military models are instructive examples of strong pre-planning. They have clearly defined mission statements, roles and objectives and a strong chain of command,²² coupled with measures of effectiveness and end-points.²⁰ However, while services may seem complementary the civilian-military interface and the promotion of closer ties between civilian and military units need further development.^{23, 27} Training can be seen as part of the solution. While training together may not produce agreement, it can help produce mutual understanding.¹⁸

Military medical personnel also have little peacetime opportunity to practice trauma skills as military medical centres do not routinely receive trauma patients. In contrast, civilian trauma centre staff care for injured trauma patients regularly.^{28, 29} A collaborative approach to training has the possibility to enhance skill sets of military personnel while

also providing a much needed infusion of manpower to help care for injured patients in civilian trauma centres.²⁸

There are also multiple additional benefits to a collaborative approach including increased and reciprocal recognition of training in both sectors, avoiding duplication of training services between sectors, but perhaps most importantly allowing the opportunity for services to train together promoting cultural awareness and cross fertilisation of ideas. The building of bridges and networks between civil and military health providers may act not just as an opportunity to provide a formal career structure, but also to retain staff in which a training investment has been made and enhancing recruitment to specialist health reserves.

Authors affiliation: 1. Professor Peter A Leggat, MD, PhD DrPH, FAFPHM, FACTM, Head, School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville 4811, Australia. Email. Peter.Leggat@jcu.edu.au

2. Associate Professor Peter Aitken, MBBS, EMDM, FACEM, Anton Breinl Centre for Public Health and Tropical Medicine, James Cook University, Townsville 4811 Australia. Email. Peter_Aitken@health.qld.gov.au

3. Dr Isaac Seidl, MBBS, MHA, GradDipStrat, FRACGP, FRACMA, psc(j), Deputy Executive Director Medical Services, Townsville Health Service District, Townsville 4810, Australia. Email. Isaac_Seidl@health.qld.gov.au

References

1. Department of Defence. Appendix 1. Staffing and remuneration. In. Defence Annual Report 2007-2008. Canberra.
2. Uniformed Services University of the Health Sciences. Homepage. URL. <http://www.usuhs.mil/> (accessed 25 July 2009)
3. De Lorenzo RA. Future trends in military graduate medical education. *Mil Med* 2006; 171: v-viii.
4. Humphery TJ. Training the physician for deployment. *ADF Health* 2002; 3: 9-12.
5. Leggat PA. Letter: Training the physician for deployment. *ADF Health* 2002; 3: 94.
6. Leggat PA. Tropical Medicine: A re-emerging specialty. *ADF Health* 2005; 6: 76-80.
7. Leggat PA, Aitken P. Ensuring the health and safety of civilian disaster medical assistance teams. *Travel Med Inf Dis* 2007; 5: 324-326.
8. Beason CF. Lessons learned: a successful distance learning collaborative between the Department of Veterans Affairs and the Department of Defence. *Mil Med* 2005; 170: 395-399.
9. De Lorenzo RA. How shall we train? *Mil Med* 2005; 170: 824-830.
10. Wakasugi M, Nilsson H, Hornwall J, Vikstrom T, Ruter A. Can performance indicators be used for pedagogic purposes in disaster medicine training? *Scand J Trauma Resus Emerg Med* 2009; 17:15.
11. Lennquist, S. The Emergotrain System for training and testing disaster preparedness: 15 years of experience. *International Journal of Disaster Medicine* 2003; 1(1): 13-22.
12. Moses G, Magee JH, Bauer JJ, Leitch R. Military medical modeling and simulation in the 21st century. *Stud Health Technol Inform* 2001; 81: 322-328.

13. Rubenstein, LS, Annas, GJ. Medical ethics at Guantanamo Bay detention centre and in the US military: a time for reform. *Lancet* 2009; 374: 353-355.
14. Lifton, RJ. Doctors and torture. *New Engl J Med* 2004; 351: 415-416.
15. Annas, GJ. Unspeakably cruel –Torture, medical ethics and the law. *New Engl J Med* 2005; 352: 2127-2132
16. Department of Defence, Joint Health Command. Medical Officer Career and Salary Structure (MOCSS). Last updated 24 March 2009. URL. <http://www.defence.gov.au/health/resources/i-mocss.htm> (accessed 25 July 2009)
17. Clements M. Retention of Senior Medical Officers, time for a rethink on career progression? *J Mil Vet Health* 2008; 16: 39-40.
18. Hodgetts TJ, Mahoney PF, Mozumder A, McLennan J. Care of civilians during military operations. *International Journal of Disaster Medicine* 2005; 1(4): 3-24.
19. Malish R, Scott JS, Rasheed BO. Military-Civic action: Lessons learned from a brigade-level aid project in the 2003 war with Iraq. *Prehosp Disast Med*, v2006; 21(3):135-139.
20. Sharp TW, Wightman JM, Davis MJ, Sherman SS, Burkle FM, 'Military assistance in complex emergencies: What have we learned since the Kurdish relief effort?', *Prehosp Disast Med*, 2001; 16(4): 197-208.
21. Taylor PR, Emonson DL, Schlimmer JE, 'Operation Shaddock – the Australian Defence Force response to the tsunami disaster in Papua New Guinea', *MJA* 1998; 169(11-12): 602-606.
22. Noji EK, Gunn SWA, Aziz AA, Chi HT, Dauphinee W, Davenport D, Gonzalez R, Jaeger H, Kipor GV, Mares CA, Shrestha RP, Yoshinaga K. '5th Asia-Pacific conference on disaster medicine. Theme 4. Effective models for medical ad health response coordination. Summary and action plan', *Prehosp Disast Med* 2001;16(1): 33-35.
23. Hampson GV, Cook SV, Frederiksen SR 'Operation Bali Assist. The Australian Defence Force response to the Bali bombing, 12 October 2002', *MJA* 2002; 177; 620-623.
24. Moore S, Blasser E. 'A new look at disaster medical assistance teams', *Military Medicine* 1991; 156(10): 543-546.
25. Nabarro D. Putting it together: stronger public health capacity within disaster management systems. *Prehosp Disast Med* 2005; 20(6): 483-485.
26. Palmer DJ, Stephens D, Fisher SA, Spain B, Read DJ, Notara L. 'The Bali bombing: The Royal Darwin Hospital response', *MJA* 2003;179: 358-361.
27. Read D, Ashford B. 'Surgical aspects of Operation Bali Assist: Initial wound surgery on the tarmac and in flight', *ANZ J Surg* 2004; 74: 986-991.
28. Johannigman JA. 'Disaster preparedness: it's all about me', *Crit Care Med* 2005; 33(1): 22-28s.
29. Pretto EA, Safar P. 'National medical response to mass disasters in the United States – are we prepared?', *JAMA* 1991; 266(9):1259-1262.

Airway management: Shining a New Light

Benjamin W. Berg, MD, Dale S. Vincent, MD, Ben H Boedeker, MD, Ph, DVM

Introduction

Airway management is practiced by anaesthesiologists, emergency physicians, critical care experts, and less frequently by specialists in other disciplines. Pre hospital personnel and military medics are also called upon to provide airway support for acutely ill and injured patients. Intubation success rates are decreased in the pre hospital setting, and when a difficult airway is unexpectedly encountered [1]. Novel approaches to improved airway rescue and management include the use of video-enabled devices, which can mitigate many unfavorable factors which contribute to low intubation success rates in emergency situations. Laryngeal visualisation is a primary determinant of successful intubation, and video-enabled devices significantly improve visualisation of laryngeal structures [2]. Training in the utilisation of video-enabled devices requires deliberate practice for unique eye-hand coordination and psychomotor skill development. Fundamental skill acquisition and device orientation can be accomplished utilising manikin airway simulators in both normal and difficult airway configurations.

Description of Workshop

Workshop participants were introduced to an ensemble of video-enabled airway management tools. The Bonfils lighted stylet, Berci videolaryngoscope, and intubating fiberscope devices (Karl Storz KARL STORZ GmbH & Co. KG, Tuttlingen Germany) were utilised. Skill stations utilising SimMan® and Difficult Airway® simulators (Laerdal Pty Ltd, Oakleigh, Victoria Australia) were configured for facilitated skills development through demonstration and deliberate practice. Simulated normal and difficult airway anatomy was presented for students to gain experience and practice skills with these novel devices. No participants had previously utilised video-enabled airway devices for intubation. Participants included nurses, medical students, oral surgeons, and practicing physicians. Each had a military role that could place them in the position of primary airway manager, despite the fact that none routinely practiced intubation in their usual clinical setting. Participants practiced techniques and skills for intubation of normal and difficult airways, using traditional laryngoscopy, and video devices. The

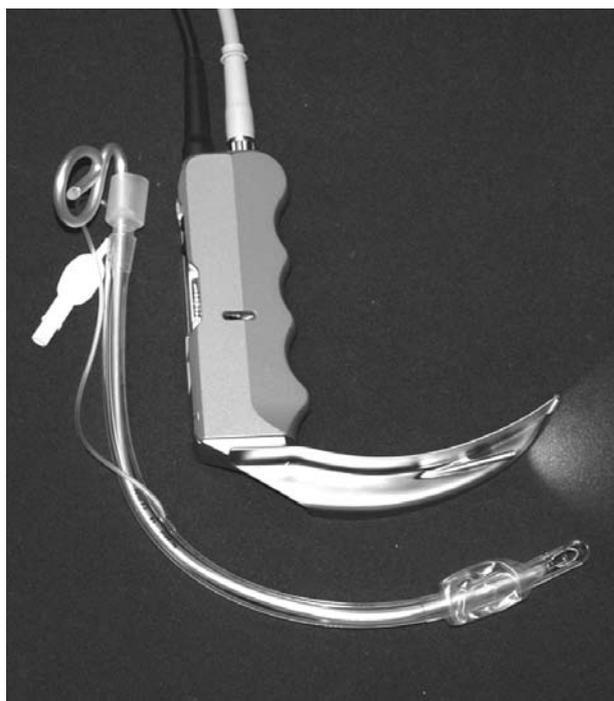


Figure 1. Storz Berci Macintosh 3 Video Laryngoscope.

Bonfils retromolar intubating video stylet was utilized for simulated trismus, the videolaryngoscope for tongue and pharyngeal oedema, and the intubating fiberscope for obstructed oropharyngeal airway and cervical spine injury simulation. Difficult airway conditions were thus replicated and successful video-facilitated intubation was contrasted to challenging and often unsuccessful intubation using traditional direct laryngoscopy. Combined video device methodologies were also demonstrated and practised [3]

Discussion

Advanced video technology has enabled miniaturised light source and image acquisition through fibreoptic bundles and video camera chips on medical devices such as endoscopes, laparoscopic instruments and others. Innovative application of video technology to airway management enables less experienced practitioners in the successful intubation of uncomplicated airways, and facilitates management of difficult airways for both experienced and inexperienced practitioners [4] [5]. Military care providers are called upon to provide care for urgent

medical conditions in challenging environments, constrained by sub-optimal environmental conditions, limited infrastructure, variable personnel, and unpredictable equipment supply. Such environments include the battlefield, deployed hospitals and aide stations, aircraft and ships.

Conclusions

Video aided laryngoscopy is evolving as a methodology for operating theatre and pre-hospital airway management. Continued development with ruggedisation and miniaturisation will afford far flung deployed medical personnel a new lifesaving tool for integration into battlefield care doctrine and algorithms. Rapid skill acquisition can be accomplished with the use of structured manikin-based training for both experienced practitioners and novices.

References

- [1] Helm M, Hossfeld B, Schafer S, Hoitz J, Lampl L. Factors influencing emergency intubation in the pre-hospital setting--a multicentre study in the German Helicopter Emergency Medical Service. *Br J Anaesth* 2006; 96:67-71.
- [2] Marrel J, Blanc C, Frascarolo P, Magnusson L. Videolaryngoscopy improves intubation condition in morbidly obese patients. *Eur Journal Anaesthesiol* 2007; 24: 1045-1049.
- [3] Greib N, Stojeba N, Dow WA, Henderson J, Diemunsch PA. A combined rigid videolaryngoscopy-flexible fibrescopy intubation technique under general anesthesia. *Can J Anaesth.* 2007; 54:492-493.
- [4] Mihai R, Blair E, Kay H, Cook TM. A quantitative review and meta-analysis of performance of non-standard laryngoscopes and rigid fibreoptic intubation aids. *Anaesthesia.* 2008; 63: 745-760.
- [5] Byhahn C, Nemetz S, Breitzkreutz R, Zwissler B, Kaufmann M, Meininger D. Brief report: tracheal intubation using the Bonfils intubation fibroscope or direct laryngoscopy for patients with a simulated difficult airway. *Can J Anaesth.* 2008; 55: 232-237.

Corresponding authors: 1. Benjamin W. Berg, MD, Director of Simulation, University of Hawaii John A. Burns School of Medicine, Telehealth Research Institute, MEB - 212, 651 Ilalo Street, Honolulu, Hawaii, USA, 96813 Email: bwberg@hawaii.edu
2. Dale S. Vincent, MD, Director of Telemedicine, University of Hawaii, John A. Burns School of Medicine, Telehealth Research Institute, MEB - 212, 651 Ilalo Street, Honolulu, Hawaii, USA, 96813 Email: dvincent@hawaii.edu
3. Ben H Boedeker, MD, Ph, DVM, Professor of Anesthesiology, University of Nebraska, Omaha VAMC, 4101 Woolworth Ave (42 and Center) Omaha, NE 68105-1850, US Email: Boedeker1@aol.com

What's new above the cords? Simulation based education for supraglottic airway management.

Benjamin W. Berg, MD, Dale S. Vincent, MD, Ben H Boedeker, MD, PhD, DVM

Introduction

Supraglottic airway management devices comprise a family of medical devices that facilitate oxygenation and ventilation without endotracheal intubation [1]. "Supraglottic airway" is a generic description for devices that facilitate ventilation and oxygenation with devices that do not penetrate the vocal cords. Classification of these devices can be constructed based on the laryngeal sealing mechanism of each device [2]. Three main mechanisms are identified: cuffed perilaryngeal sealers (e.g. laryngeal mask airway), cuffed pharyngeal sealers (e.g. laryngeal tube), and cuffless anatomically preshaped sealers (e.g. I-gel airway). Supraglottic devices became routinely used in the operating room with the advent of the laryngeal mask airway (LMA) over 20 years ago. Emergency resuscitation paradigms have traditionally utilised sealed facemask (a type of supraglottic device) ventilation by pre-hospital personnel and others who are untrained in intubation techniques. A variety of alternate devices have been developed which can be placed blindly, and reliably provide secure oxygenation and ventilation, some with the capability of secure conversion to an endotracheal tube. Advantages of these devices include higher seal pressures (allowing higher ventilation pressure), ease of insertion, the ability to drain gastric fluid and the ability to avoid cervical spine neck extension to visualize the larynx. The Combitube, Laryngeal tube, I-gel Airway, Streamlined Pharynx Airway Liner (SLIPA), and intubating laryngeal mask airway are examples of such devices. New commercial supraglottic devices are regularly introduced for clinical use and over 25 versions are currently available from multiple manufacturers. The King Laryngeal Tube is a simple-to-use, reliable device that results in >90% first attempt successful placement by paramedics in a pre-hospital clinical setting [3]. In general, blindly placed supraglottic devices are contraindicated in patients who are awake, with intact gag reflexes, or with distorted supraglottic anatomy. Complications can include malpositioning, aspiration and upper airway trauma. Reference [4] contains images of the described devices.

Simulation-Based Training Methods

Simulation-based familiarisation and training in the indications, contraindications, and device-specific techniques can be utilised to provide practitioners exposure to multiple devices in a short period of time. Simulation can likewise be utilised to assess individual performance and device functionality. Effective use of simulation for these purposes requires knowledgeable matching of the selected supraglottic device to the airway simulator chosen for training [4]. A recent review concludes that none of the four airway training manikins studied was a single "best" match for all of the eight supraglottic devices tested, and that several devices were suitable for training with a wide variety of supraglottic airway devices. The Laerdal Airway Trainer and Trucorp Airsim simulators performed well with most supraglottic airway devices. Difficult airway simulation with pharyngeal swelling and trismus can be introduced as curriculum elements with the Laerdal Airway trainer, extending the versatility of the device for advanced airway management training.

Summary

Simplicity of blind placement technique and high rates of correct positioning make supraglottic airway devices an important element in the armamentarium available for emergency airway rescue. A large variety of devices are available, with varying performance characteristics and variable degrees of evidence regarding use in the pre-hospital setting. Pre-hospital and emergency airway management with supraglottic devices is advocated more routinely as evidence accumulates [5]. Simple low cost airway simulators are available for evaluation of devices, training and assessment.

Conclusions

The use of supraglottic airway devices is a pre-hospital airway management strategy whose time has come. "Above the cords" is now a validated anatomic location for definitive airway management strategies in pre-hospital and emergency settings.

Corresponding authors: 1. Benjamin W. Berg, MD, Director of Simulation, University of Hawaii John A. Burns School of Medicine, Telehealth Research Institute, MEB – 212, 651 Ilalo Street, Honolulu, Hawaii, USA, 96813. email: bwberg@hawaii.edu
2. Dale S. Vincent, MD, Director of Telemedicine, University of Hawaii, John A. Burns School of Medicine, Telehealth Research Institute, MEB – 212, 651 Ilalo Street, Honolulu, Hawaii, USA, 96813. email: dvincent@hawaii.edu
3. Ben H Boedeker, MD, PhD, DVM, Professor of Anesthesiology, University of Nebraska, Omaha VAMC, 4101 Woolworth Ave (42 and Center) Omaha, NE 68105-1850, US. email: Boedeker1@aol.com

References

- [1] Jolliffe L, Jackson I. Airway management in the outpatient setting: new devices and techniques. *Curr Opin Anaesthesiol.* 2008; 21:719-722.
- [2] Miller DM. A proposed classification and scoring system for supraglottic sealing airways: a brief review. *Anesth Analg* 2004; 99:1553–1559
- [3] Wiese CH, Semmel T, Müller JU, Bahr J, Ocker H, Graf BM. The use of the laryngeal tube disposable (LT-D) by paramedics during out-of-hospital resuscitation-An observational study concerning ERC guidelines 2005. *Resuscitation.* 2008 Nov 14. [Epub ahead of print]
- [4] Jackson KM, Cook TM. Evaluation of four airway training manikins as patient simulators for the insertion of eight types of supraglottic airway devices. *Anaesthesia.* 2007; 62: 388-393.
- [5] Pre-hospital airway management: guidelines from a task force from the Scandinavian Society for Anaesthesiology and Intensive Care Medicine. Berlac P, Hyldmo PK, Kongstad P, Kurola J, Nakstad AR, Sandberg M; Scandinavian Society for Anesthesiology and Intensive Care Medicine. *Acta Anaesthesiol Scand.* 2008; 52: 897-907.

General Practice training in the ADF - square peg, round hole?

Associate Professor Scott Kitchener

Introduction

For the newly serving Medical Officer in the ADF (ADF MO), professional progression opportunities are both in rank and in competency level (CL). The requirements for promotion in rank and the means of achieving the requirements are fairly well defined, assessed regularly and supported by the Military infrastructure as the time honoured way of professional progression.

This is not well suited for the clinician who must consider maintaining parity with civilian standards. In recent years the Competency Level system has been developed to respond to this dual loyalty in professional development that confronts Medical Officers. It is also employed in other specialist streams in the military for which there are direct civilian standards and comparators of progress.

While a step forward for dealing with competing professional development issues for Medical Officers, this system of progression to a competency level of unsupervised practice is less well supported. This paper examines the pathways, problems and solutions for ADF MO progressing to CL3 – a Medical Officer able to practise unsupervised in primary health care having met and continuing to maintain the requirements of one of the civilian Primary Health Care Colleges in addition to military and military medical training relevant to their rank and position.

Background

In Australia, doctors who wish to pursue a career in primary health care may enter the Australian General Practice Training (AGPT) program funded by General Practice Education and Training Ltd (GPET) and administered through Regional Training Providers (RTPs) based in rural, regional and metropolitan areas of Australia. Of course they may undertake to construct their own program and, after a suitable period of time in practice, attempt the examination; however this path is not supported by provisional vocational registration which a GPET trainee enjoys and the pass rate for the final examination is lower than those being guided through the AGPT pathway.¹

The ADF MO will be eligible for Competency Level 2 once they have completed initial officer training, military medical training relevant to their Service, basic emergency management training and a short

period of supervised civilian clinical practice. This level (CL2) includes MO who are deployable, being able to practise under remote supervision. They are at this level expected to enter (or have entered) an approved postgraduate training program. The majority will enter postgraduate medical training in primary health care: the AGPT Program towards Fellowship in the Royal Australian College of General Practice (RACGP) or the Australian College of Rural and Remote Medicine (ACRRM).

The AGPT program has been constructed to combine education and training with service provision for doctors to progress through a “continuum of education” to “develop their capacity to provide safe and effective medical services to the community”. Thus the AGPT program has two main goals:

- to produce competent and confident practitioners able to practise in a variety of settings, including rural and remote areas, and
- to provide vocational education and training that assists and prepares registrars to obtain vocational recognition as general practitioners in Australia.²

The AGPT Program supports the ADF requirement for medical, as distinct from military and military medical training, to attain and maintain CL3. It does this by producing confident and competent practitioners able to practise in a variety of settings. Moreover it does it indirectly in that vocational registration in Australia now requires attainment of Fellowship in the RACGP or ACRRM, Colleges, qualifications which specifically meet the ADF requirement for CL3 and require continuing professional development to be maintained, another requirement of CL3.

Doctors choosing to join the AGPT Program apply to both AGPT and a Regional Training Provider (RTP) in their geographic area of Australia. They are interviewed by the RTP using a GPET approved process of multiple mini-interviews and are selected based on merit. Positions are limited on the Program and Regional Training Providers and are capped in the number of Registrars able to be accepted. Australian Defence Force applicants also undergo this process, though are selected as *supernumerary* Registrars to an RTP. Training is largely experiential, delivered primarily in an apprentice model by accredited supervisors in accredited medical practices and with pre-

approved courses. The RTP then provides additional educational activities including workshops and visits by external clinical teachers who sit in periodically on consulting sessions with the Registrar in their practice. Philosophically, the program relies upon self-directed learning as for most adult learning programs. Students are expected to set learning plans guided by the College curricula. They are also guided by Medical Educators in the RTP. The RTP Senior Medical Educator has the final responsibility for verifying that the Registrar has completed training requirements of the Program submitting the Completion of Training (COT) certificate, collated log book and evidence of training to the Colleges for Fellowship.

The two Colleges involved, RACGP and ACCRRM, set the curricula standards and the end point to determine completion of training and Fellowship.

The Program

The actual Program is basically three years following the Intern Year. At the end of an Australian Medical Intern Year a medical graduate completing sufficient time with appropriate terms in an approved teaching hospital may register as a Medical Practitioner in a State of Australia. Overseas Trained Doctors (OTD) undertake a different pathway which for the purposes of this discussion will not be detailed other than their arrival also at the point of registration as a Medical Practitioner in a State of Australia.

During the Intern Year and next postgraduate year (generally PGY2) the Program requires rotations to be undertaken in Internal Medicine, Surgery and Emergency Medicine with experience in Paediatrics and Obstetrics and Gynaecology. The PGY2 year is referred to as the Core year or Core Clinical Experience, undertaken in a hospital accredited for Intern training. This is referred to as the *first* year of the Program.

Potential Registrars may apply for entry to the Program during their Intern Year, for starting in PGY2, or apply in PGY2 to start the following year. In the latter case they then need to apply through the Senior Medical Educator of their RTP for recognition of prior learning (RPL) for their Core Clinical Year.

Variation in the early Program for ADF Registrars

Some ADF MO are organised to apply during the Intern Year and many apply in PGY2 and then apply for RPL. This is where the first problem arises for the ADF Registrar. AGPT Policy *recommends* the ADF Registrar undertake three months of supervised civilian general practice during the PGY2 year. This is reinforced by Joint Health Command requirements however, being before a civilian Registrar would normally begin supervised general practice, the ADF Registrar requires particular attention to have this

requirement organised and accommodated.

As a young doctor yet to be associated with an RTP or even a supernumery Registrar new to an RTP, the level of attention required to accommodate the required organisation and advocacy with training hospitals may not be forthcoming. They then need to try to arrange a civilian GP attachment during their return of Service or thereafter.

The B&A Year

The AGPT Program focuses on the next year (PGY3) when the majority of direct teaching and close supervision occurs. During this year a Registrar would be placed in an accredited training practice with a Supervisor who is on site 80-100% of the time and the Registrar receives three hours of teaching per week during the "Basic Term" in the first six months of this year. In the following term (six months), the "Advanced Term", the Supervisor is present 50% of the time on site and the Registrar receives one hour teaching per week. During this "B&A" Year, up to four weeks of workshops are delivered by the RTP, covering topics not readily taught by the Supervisor or experiences not received in supervised practice. The Registrar may obtain some of these training on other courses pre-approved by the civilian RTP Medical Educator.

The "Bloody Awful" year for the ADF Registrar?

Of course this third year postgraduate for many ADF MO is their first year of their return of Service. During this year they will undertake initial officer training, military medical courses in health, aeromedical evacuation, underwater medicine, aviation medicine or a combination of these; in addition to emergency medicine courses.

In a very busy year also punctuated by assimilating to military life and being newly introduced to military medical practice after the cocoon of a teaching hospital, the ADF Registrar on the AGPT Program is expected to complete the Basic and Advanced Terms. Needless to say ADF Registrars do not always meet the Program requirements for the B&A Year. Conversely, for civilian Registrars, the B&A year is an intense year of direct support and advocacy by their supervisor, their RTP and the Medical Educators.

Medical Educators

The Policies of the AGPT make much of the role of a Medical Educator as a key person understanding the experience and training needs of Registrars. Further, several specific roles also exist for Medical Educators under the AGPT Policies. In application to the training of ADF Registrars (referenced from AGPT Policies, 2008 as below) these include:

- Understanding and considering experience, training and education (s3.1.2.11) - including that obtained during military exercises and deployments
- Liaising on behalf of the (ADF) Registrar with relevant Colleges regarding recognition of prior learning (RPL) (s4.1.2.3)
- Considering relevance and adequacy of experience and educational activities with a view to approving RPL ... (s4.1.2.4)
- Determining and assessing the learning needs of the (ADF) Registrar early in training to inform the initial learning plan (s4.2.2)
- Assess the structure and content of teaching posts to determine the amount of training time that can be credited to the (ADF) Registrar's record of training (s5.3.2)
- Confirming progression of a Registrar to the next level of training particularly when a term may not have been completed satisfactorily (s4.2.2.6)
- Determining appropriate supplementary training to (military) practice experience (s3.1.2.7)
- Advising on appropriate extended skills training posts for (ADF) Registrars (s3.1.2.8)
- Consultation on discretionary leave requirements for ADF Registrars for Service needs (s3.1.2.9)
- With the supervisor, identify, provide feedback and address the areas of concern when a Registrar's knowledge base or acquisition is apparently not satisfactory (s4.2.2.10&11)
- Determining the eligibility of the Registrar for completion of training (with respect to College requirements) in relation to work-based components of the program - which will include a number of military terms and educational experiences (s4.3.2)
- Being the first point for discussion of grievances regarding the program and participates in the assessment and review panel (s5.6)
- Reviewing for exclusion or extension of Registrars in the AGPT program (s5.7 & 5.8)

A Case for *Military* Medical Educators

Even from the abbreviated list of the tasks for a Medical Educator, their role is evident as being central in understanding the learning experience of the Registrar, guiding them to achieve the stated learning objectives of the AGPT Program.

The AGPT Program recognises that experienced and practicing civilian GPs have *a unique mix of educational experience and practical knowledge and experience in the general practice environment* to meet this role. Similarly to meet the role for ADF Registrars,

Medical Educators and their support structures (the Regional Training Provider) must have that unique mix of educational experience *understanding military educational opportunities* and practical knowledge and experience in the *military* practice environment. Notwithstanding the effort and dedication of Medical Educators and RTP, this is not the case for the majority to which ADF Registrars are attached as *supernumery* Registrars.

Workshops

As discussed, the Program conventionally includes workshops which typically include direct classroom and practical teaching on topics not readily delivered by Supervisors or available in the practice setting. These are organised by the RTP, delivered mostly during the Basic and Advanced terms.

For ADF Registrars practicing in the military environment, the topics not readily delivered by Supervisors or available in the military practice setting are notably different to those of a Registrar in civilian General Practice. However, being supernumery the ADF Registrar attends workshops to receive teaching required for civilian Registrars.

More appropriate for the ADF Registrar would be to map the curriculum required within the Program, identify that which is not routinely available in military supervised practice and provide teaching on these topics.

The Subsequent Year

The typical AGPT Program follows the B&A Year with a year of supervised practice, commonly in a new location, with less teaching and supervision. The Supervisor is required on site for at least 25% of the time. There is no routine teaching each week. Often Registrars prepare for the Fellowship examination during this year. Many Registrars will elect to undertake six months of this year in an Extended Skill Term in which they move to a supervised position in a specialised area of practice, such as Obstetrics, Internal Medicine, Emergency Medicine, Skin Cancer Medicine, etc.

For the ADF Registrar now undertaking Service specific specialisation courses such as Aviation Medicine, Underwater Medicine, NBCD, and so on, this should be a great opportunity to complete an Extended Skill Term rarely available to civilian Registrars. However, Extended Skills Terms must be approved prospectively by the Senior Medical Educator of the RTP. In the process, the Medical Educator should assist the Registrar to develop a learning plan identifying learning objectives which they will confirm are met during the Term. If the Medical Educator is not

notified of the military course or has no experience or knowledge of the course or the specialised area content, then developing a relevant learning plan and confirming achievement of objectives is difficult if not impossible. In many cases and for many reasons approval of ADF Registrars does not happen and they simply lose this time from the training program despite the value and uniqueness of the experience.

The Subsequent Deployment

Another common happening once an ADF MO achieves CL2 is the opportunity to deploy. Again this is a clinical, professional and personal experience rarely offered to civilian Registrars or medical practitioners. Also again, such a clinical posting requires prospective approval under the AGPT Program, that approval undertaken by the Senior Medical Educator. For those Senior Medical Educators not familiar with the clinical experiences of a deployment, developing a learning plan, approving the experience and particularly approving the supervisory arrangements is extremely difficult. Consequently, again, ADF Registrars may not have this time approved and the time is lost from their Program.

Discussion

So, for the ADF Registrar there is often a difference between the intended curriculum and the flow of that curriculum into reality. To a degree, the hidden curriculum offered to the ADF Registrar gives some recognition of the requirement to manage him or her with some different policies, they are in fact supernumary to the training provider. Their practice experience and learning opportunities are sometimes worthwhile and included in their program, although it is not routine to have Medical Educators with common practise experiences guide them.

What is the global view of the ADF Registrar curriculum? The AGPT program intends an outcome of competent and confident practitioners able to practise in a variety of settings. But does it produce a doctor able to practise unsupervised in the military environment as is required by the ADF? Well, probably not fully and certainly not efficiently.

There is somewhat of a mismatch between the ADF Competency Level policy and the AGPT Program upon which progression (to CL3) is hinged. The intention in matching professional advancement to an existing civilian program is most appropriate though lacking in key resources to marry the desired outcomes of the CL policy and the AGPT Program.

The mismatch between ADF and AGPT outcomes may be reconciled by accommodating some of the military medical learning opportunities and requirements

within the Program outcomes. This can largely be done within the discretionary responsibilities (under AGPT policies) of a Senior Medical Educator who is aware of military practise. This is essentially reconciling outcomes to the content of an ADF Registrar's program and moving towards improving the efficiency of the Program for ADF Registrars.

Conclusion

The ADF has wisely split professional development for MO into military and clinical progression through Rank and Competency Level. Medical Officers though have a difficult time advancing through the required training to clinical Competency Level 3.

It is possible to match the content of an ADF Registrar's training pathway with that of AGPT Program by recognising the worth of ADF clinical training and clinical experiences of deployment while retaining core clinical skill training required of all primary care physicians. Thus relevant content for ADF Registrar training can be matched to outcomes significant for the immediate clinical environment required for ADF practise and enduring outcomes valuable for the primary care doctor either in the ADF or in civilian clinical practice.

How can this be done?

There is a need to have a more comprehensive view of the curriculum suitable for ADF Registrars. Some situational awareness is required by Medical Educators experienced in military practice to develop the ADF curriculum within the AGPT Program. Within discretion permitted by Senior Medical Educators (under AGPT Policy), changes in organisational arrangements and the emphasis of the Program for ADF Registrars could match well to the rich ADF clinical and practical environment. The outcome would be an efficient and well focused curriculum for the ADF Registrar meeting both the requirements for the ADF and those of the AGPT Program – smoothing the corners of the square peg to fit the round hole of opportunity.

Contact author: Associate Professor Scott Kitchener, Centre for Military and Veterans' Health, University of Queensland, Herston Campus, Herston Road, Herston, Qld, 4000, Australia Email: s.kitchener@uq.edu.au

1 Based on pass rates from the second RACGP Fellowship exam for 2008.

2 The Australian General Practice Training Policies (2008), General Practice Education and Training Ltd.

Evolving mechanisms and patterns of blast injury and the challenges for military first responders

CPL C. Stevenson



Introduction

Explosions cause more military casualties (65.5%), than any other combat mechanism of injury^{1-9, 14, 16, 18}. Injury patterns have evolved as a direct result of developments in personal protective equipment and insurgent tactics techniques and procedures (TTPs)^{8, 15, 17, 18}. The purpose of this paper is to outline emerging blast mechanisms of injury (MOI) directed against coalition troops in Iraq and Afghanistan, resultant patterns of injury (POI), and prehospital challenges which first responders encounter with this unique group of casualties.

Mechanisms of injury

Blast injuries are categorized by mechanism into primary, secondary, tertiary and quaternary injuries^{1-10, 17, 18, 23}.

Primary injury

Primary injuries are the consequence of the rapidly expanding blast wave which follows a detonation^{2, 3, 10, 16, 17, 18, 23}. The blast wave quickly exerts blast overpressure (BOP) outwardly from the centre of the blast⁴. Underpressure rapidly follows^{10, 16}. The abrupt pressure change stretches then contracts human tissue beyond normal limits. Consequently it is referred to as barotrauma (literally 'pressure injury')²¹. The peak physiological effect is experienced by air filled organs; the middle ear, lungs and colon^{10, 16, 18, 22, 23}.

Secondary injury

Secondary injuries involve penetrating trauma. Projectiles are driven indiscriminately from the detonation site into humans at up to 1800 metres per second^{1, 2, 16, 17, 18, 23}. Projectiles can be incorporated into the design of the device such as: metal casing (classically termed 'shrapnel' after its 1784 inventor Major-General Henry Shrapnel¹⁹), nails, nuts, bolts, or glass coated in faeces designed to maximize secondary infection^{17, 29}. Other missiles can be energized by the blast wind including rocks, dirt, bone fragments of other casualties, and clothing^{17, 29}. The velocity and irregular profile of blast missiles cause haemorrhage and localized crush injuries which are more extensive than gunshot wounds (GSWs)¹⁶.

Tertiary injury

Tertiary injuries are a consequence of blunt trauma, as humans are propelled into stationary objects, or along the ground^{18, 23}.

Quaternary injury

Quaternary injuries are an assortment of miscellaneous insults encompassing respiratory compromise, thermal burns, and crush injuries^{18, 23}. To summarize these effects primary is movement of air pressure, secondary is movement of projectiles, tertiary is movement of humans, and quaternary are miscellaneous injuries.

Casualties are likely to experience multiple blast effects and multi system injuries^{17, 29} depending on: proximity to the epicentre of the explosion, protective equipment employed⁶, whether the explosion occurred in a confined space and the size and shape of missiles energized by the blast^{4, 18, 23}. The blast energy to time and distance relationship is inversely proportional, i.e. as time and distance increase from detonation, blast wave energy decreases⁴. The result is that casualties situated three metres from the blast are subjected to nine times more blast effect than casualties situated six metres from the blast⁴.

Blast enhancement

Blast waves are enhanced by environmental factors such as confined spaces, underwater detonation and

focused detonation^{4, 18}. The walls of a room, bus or train confine and reflect the blast wave, increasing the extent of injuries experienced by casualties trapped inside⁴. The world witnessed a diabolical example of multiple confined blasts in the July 2005 London bombings. Fifty were killed and seven hundred injured by improvised explosive devices (IEDs) placed on three trains and one bus¹¹. After an underwater detonation, the blast wave and sound are transmitted faster and further than a surface detonation^{4, 12}. A focused blast occurs when all of the kinetic energy is channelled along the path of least resistance, in the same way a bullet is propelled directly through a rifle barrel.

Concealed IEDs

A characteristic concealed IED employed by insurgents in Iraq consists of a camouflaged bank of 155mm artillery rounds (up to seven)²⁵ packed behind rows of conical copper discs. The IED is remotely armed by mobile phone, and initiated when a vehicle breaks an infrared beam. On detonation the concave faces of the discs are forced inside out to form a molten hot projectile capable of penetrating armoured vehicles. The IED can be aimed horizontally at specific crew members of a vehicle with devastating accuracy. As this penetrating device is created post detonation it is referred to as an explosively formed projectile or penetrator (EFP)¹⁸. Other IEDs consist of an artillery round, homemade explosives (HME) concealed underground and initiated remotely by one of a number of commercial available electronic transmitting devices³. Anti personnel and anti tank mines are used in isolation or to initiate IED's. Convoys that maintain strict inter vehicle spacing are able to minimize concealed IED casualties²⁵.

Vehicle borne IEDs

Attacks on infrastructure and convoys are achieved with vehicle borne IEDs (VBIEDs)³. VBIEDs are capable of delivering considerable quantities of explosives². An average sized car can deliver 200kg of explosives, and a light truck 27000kg². A current TTP which maximizes casualties is to dispatch a truck to breach a roadblock². As first responders arrive on scene, a VBIED approaches and detonates². A second VBIED may follow shortly afterwards²³.

Building contained IEDs

A static IED which accommodates a significant quantity of explosives and propellants is a building contained IED (BCIED)¹³. A BCIED can be remotely detonated or victim initiated. The blast effects are enhanced by the confined space.

Human borne IEDs

Human borne IEDs (HBIEDs) also known as suicide vest IEDs (SVIEDs) bring to bear less explosive

than VBIEDs and BCIEDs². Generally the quantity of explosives which can be carried is limited to the amount which can be concealed in a vest or belt under clothing or inside a backpack. Women and intellectually handicapped people are increasingly being used as SVIEDs. Cultural sensitivities in Afghanistan generally prevent women wearing the burqa (a traditional head to toe garment which conceals the wearers face behind a cloth mesh screen) from being searched by coalition forces³⁵. In Eastern Afghanistan males and females armed with SVIEDs and assault rifles concealed in burqas attacked government buildings killing 12 in July 2009³⁵. In April 2009 two female SVIED's killed 60 people in Baghdad³⁴. Backpack IEDs can be thrown at or attached by magnet to vehicles as they pass through choke points or retained by the wearer (as seen in the 2005 London railway and bus bombings)^{2, 11}.

Indirect blasts

Indirect fire blasts are delivered by Katyusha rockets. A Katyusha (Russian for 'little Katherine') rocket comprises an artillery round launched along an improvised rail or tube which is indirectly aimed at a target. 107mm or 122mm rounds are commonly used^{3, 20}. In Iraq and Afghanistan, multiple rockets are ground launched or mounted on enclosed trucks utilizing a timing device so insurgents are not exposed to return fire²⁰.

Direct blasts

Direct fire blasts are delivered by rocket propelled grenades (RPGs)³. The RPG consists of a 1.4 kg high explosive (HE) warhead launched from a shoulder mounted tube²⁴. The firer is positioned in line of sight of the target at distances of up to 500m²⁴.

Patterns of injury

Demographics

It is pertinent at this point to explore the demographics of coalition military casualties in Iraq and Afghanistan. These are males with a mean age of 26-28 years^{5, 6}. This is significant for recovery because soldiers in this age group are generally healthy, with good physiological reserves. Blast injury has been described as the "signature injury" of the current conflict in Iraq^{2, 18}. The current casualty survival rate is 88-96%, which is a significant increase since the Vietnam War (76.4%)^{2, 3, 17, 18}. Injuries which had poor outcomes in previous conflicts are now survivable but with devastating life changing consequences^{2, 6, 17, 18}. This is a result of improvements in personal protective equipment (e.g. body armour, ballistic helmets and ballistic eyewear) and medical care (forward definitive care, rapid critical care, aeromedical evacuation and expert rehabilitation)^{2, 6, 15, 17, 18, 29}.

Immediate death

Immediate death is expected in casualties situated in the immediate vicinity of the detonation due to massive tissue destruction. This occurs despite prehospital resuscitation and is an incredibly confronting reality for first responders^{16,23}.

Primary injuries

In Iraq, IED's characteristically produce a BOP greater than 60 pounds per square inch (psi)⁶. To put this into perspective, rupture of the tympanic membrane (TM) can occur following exposure to five psi of BOP⁴. A Hellfire II air to ground missile delivers 5 000,000 psi of BOP³³. One third of casualties experiencing TM rupture will suffer from permanent hearing deficit⁴. Young healthy ears containing cerumen experience the most favourable outcomes following BOP exposure^{4,23}. Pulmonary contusion ('blast lung') occurs following exposure to 15 psi of BOP⁴. TM rupture was previously thought to be an indicator of underlying 'blast lung'. It is now known that there is no correlation between the two insults; one can occur in the absence of the other^{4,10}. Historically only a small number of casualties experience intestinal contusions ('blast abdomen') (1.2%)¹⁰. The region of the gastrointestinal tract most likely to suffer the ill effects of BOP is the large intestine. Blast abdomen is difficult to diagnose in the field²³. Onset of sequelae for blast lung and abdomen can be 12-48 hours after the initial insult⁴. Traumatic brain injury (TBI) or blast brain occurs in 50% of blast casualties and is frequently undiagnosed until the



rehabilitation phase of care^{1,6,7,18,27,29}. The causes of late TBI diagnosis are multifactorial. Ear injury and hearing deficit are common (64% of blast casualties)^{1,6}. Confused casualties experiencing TBI may be assumed to be suffering from hearing deficit^{6,18}. Due to unconsciousness and more immediate concerns such as massive haemorrhage, damage control surgery and rapid strategic aeromedical evacuation, neurological investigation is often assigned a lower priority and may not occur until the rehabilitation phase of care^{1,6,18}. There is a direct correlation between TM rupture and TBI following blast exposure²⁷. Ballistic helmets and eyewear are ineffective against BOP². Spinal injuries can occur when vehicles strike concealed IEDs¹⁶. The upward blast results in excessive axial loading, particularly when the victims head strikes the ceiling of the vehicle¹⁶.

Secondary injuries

Fifty per cent of combat deaths result from exsanguination³⁰. Body armour, ballistic helmets and ballistic eyewear are particularly effective in preventing secondary blast injuries^{17,18,29}. However the unprotected body regions (face, neck, axillae, groin, buttocks and limbs) are vulnerable to insult. Chest injuries which were previously associated with a high mortality rate are now minimised with the use of body armour^{3,17,29}. Injuries to the face and neck account for 21% of combat injuries and 64% of combat deaths^{8,15,29}. The kidneys are reasonably well protected by body armour, and the frequency of genitourinary injuries is the same as other wars²⁸. Insurgents are using increasingly sophisticated directional blasts to target the groin and axillae¹⁷.

Extremity injuries comprise 60-75% of blast injuries^{3,16}. Typically these include: large lacerations, multiple small 'peppered' wounds, and mangled extremities^{17,29}. In isolation these injuries are generally not fatal when treated promptly^{8,15}. Peppered wounds are the product of multiple high velocity blast energized missiles^{16,18}. Projectile pathways penetrate deep within the body forcing foreign bodies and contaminants into those regions^{16,18}. Traumatic amputation is the result of BOP and the secondary shearing effect¹⁶. The consequences are catastrophic haemorrhage, mutilation and heavy contamination. This group of casualties have a poor prognosis due to the exposure to significant destructive forces^{6,16}.

Tertiary injuries

Tertiary injuries are classic acceleration deceleration blunt insults. Head injury, TBI and fractures are common in blast casualties^{1,10,18}.

Quaternary injuries

Quaternary injuries include respiratory compromise from an array of inhaled pollutants (ranging from carbon monoxide and minute particulates to toxic by-products of the combustion process) and airway burns, external thermal burns from the superheated blast wind pursuing the blast wave, and crush injuries following structural collapse^{18, 23, 29}.

The challenges

Number of casualties

A typical ratio of dead to injured following a blast is 4:35³², i.e. for each immediate death there are approximately eight injured, a considerable number of casualties for first responders⁴. The language barrier makes assessment of multiple civilian casualties complex.

Haemorrhage control

Combat related haemorrhage is difficult to control. Effective management is the product of training and experience. Small entry wounds can conceal significant internal injuries with resultant massive haemorrhage^{16, 17, 29}. Intra abdominal haemorrhage can result from missile wounds to the thigh, buttocks or perineum¹⁶. Small entry wounds can be filled with packing gauze or a similar improvised product. In the presence of massive haemorrhage, mutilated extremities and traumatic amputations, an appropriately applied tourniquet is an excellent method of haemorrhage control. Catastrophic tissue devitalisation is invariably confronting for first responders.

Evacuation time

The time from combat injury to evacuation is easily prolonged by severe weather, tactical constraints and terrain^{30, 31}. This is particularly relevant in the mountainous Hindu Kush in Afghanistan where rotary wing airframes experience power limitations at elevations greater than 10 000 feet³¹. Access to casualties can be complicated when first responders are targeted by insurgents. Knowledge of evacuation procedures is essential for all team members as key personnel can become victims. The mode of evacuation (surface/aeromedical or a combination) must be an early consideration.

Wound contamination

Extensive environmental contamination of wounds causes significant risk of secondary infection. Cephalosporins are recommended particularly in the case of open fractures¹⁶. In the delayed evacuation scenario, the early administration of Ceftriaxone (carried by Advanced Medical Technicians) is feasible.

Diagnostic dilemma

Confused casualties encountered during the prehospital phase may be experiencing a TBI, hearing deficit, or both¹⁸. Performing a neurological assessment in the field on civilian casualties is complicated by the language barrier.

Hypothermic coagulopathy

Preventing hypothermia and the resulting coagulopathy is extremely challenging in trauma casualties²⁹. When a casualty's core temperature decreases beyond 32 degrees Celsius, clotting factors become ineffective. In the absence of effective clotting factors, concomitant bleeding is exacerbated. Hypovolaemic shock and clothing removal are probable causes of hypothermic coagulopathy²⁹. Clothing may be blown off as a result of primary and quaternary blast effects, or removed during the primary survey.

Conclusion

The critical message for first responders to take home from the coalition experience in Iraq and Afghanistan is the value of haemorrhage control and blast injury training. To be merely familiar with blast injuries is inadequate. Buddy aid must be instinctive to be effective. All troops must be proficient in haemorrhage control, as buddy aid saves lives before clinicians arrive on scene. It is a command responsibility to ensure that personnel are adequately trained in first aid for blast injuries. First responders at all levels from the combat first aider upwards must proactively seek to train their dependants to respond decisively to blast injuries.

Contact author: CPL C. Stevenson (Advanced Medical Technician) Royal Australian Army Medical Corps
Email: charles.stevenson@defence.gov.au

References

1. Scott S, Belanger H, Vanderploeg R, Massengale J, Scholten J. Mechanism of injury approach to evaluating patients with blast related polytrauma. *JAOA*. 2006; 106 (5):265-270
2. Weybright C, Surviving the injuries of war. veteransvoice.wordpress.com/2007/04/08/surviving-the-injuries-of-war/. 08 April 2007
3. Hyer R, Iraq and Afghanistan producing new pattern of extremity war injuries. www.medscape.com. 27 March 2006
4. Lavonas E, Blast injuries. emedicine.com. 30 Dec 2003
5. Kauvar D, Wolf S, Wade C, Cancio L, Renz E, Holcomb B. Burns sustained in combat explosions in Operations Iraqi and Enduring Freedom. *Burns*. Nov 2006 32 (7):853-857
6. Chandler D, Blast-related ear injury in current U.S military operations. *The ASHA Leader*. July 2006; 11 (9):8-9, 29
7. Taber K, Warden D, Hurley R. Blast related traumatic brain injury: What is known? *J Neuropsychiatry Clin Neurosci*. May 2006; 18 (2):141-145
8. Xydakis M, Casler J, Delwood. Analysis of battlefield head and neck injuries in Iraq and Afghanistan. *Otolaryngology head and neck surgery*. August 2004
9. Tien H, Farrell R, Macdonald J, Preparing Canadian military surgeons for Afghanistan. *CMAJ*. 2006; 175 (11):1365-1366
10. Mayo A, Kluger Y, Blast-induced injury of air-containing organs. *ADF health*. April 2006; 7:40-44
11. Minute by minute account. cnn.com. 11 May 2006
12. Elliott D, Bennett P, The physiology and medicine of diving 4th ed. Saunders. 1993; 245
13. Bellavia D, House to house. Simon & Schuster. 2007; 121
14. Fearful asymmetry. *The Economist*. 01 May 2008
15. 1 in 6 injured in Iraq, Afghanistan need treatment by Otolaryngologists. www.medicalnewstoday.com. 19 September 2004
16. Covey D, Blast and fragment injuries of the musculoskeletal system. *J Bone Joint surg*. 2002;84A (7):1221-34
17. Gawande A, Casualties of War- Military care for the wounded from Iraq and Afghanistan. *NEJM*. 2004; 351 (24):2471-2475
18. Gean A, Battlefield brain injury: the lessons from Iraq. medicexchange.com. 6 Dec 2007
19. www.britannica.com/EBchecked/topic/541996/Henry-Shrapnel
20. www.globalsecurity.org/military/world/russia/katyusha.htm
21. Dorland's illustrated medical dictionary. 2003; 30: 201-2 22. www.bordeninstitute.army.mil/published/volumes/ophthalmic/ophthalmic.html
23. Stewart C, Nixon R, When Things Go Boom: Blast Injuries. www.fireengineering.com/articles/article_display.html?id=204602. 01 May 2004
24. www.defense-update.com/products/r/rpg-29.htm
25. Fennell K, Warrior brothers, my life in the Australian SAS. Random House. 2008; 221-234
26. Iraq coalition casualty count. icasualties.org. 03 Oct 2007
27. Robbins A, Tympanic-Membrane perforation as a marker of concussive brain injury in Iraq. *NEJM*. August 2007; 357 (8):830-831
28. Paquette E, Genitourinary trauma at a Combat Support Hospital during Operation Iraqi Freedom: The impact of body armour. *The Journal of Urology*. June 2007; 177 (6):2196-2199
29. Rosenfeld J, Rosengarten A, Paterson M, Health support in the Iraq War. *ADF Health*. April 2006; 7:2-7
30. Kragh J, Baer D, Walters T, Extended (16-hour) tourniquet application after combat wounds: A case report and review of the current literature. *J Orthop Trauma*. April 2007; 21 (4):274-278
31. Hirsh M, None braver: US Air Force pararescuemen in the war on terrorism. *NAL Caliber*. 2003; 7-8, 12, 14, 24, 161, 192.
32. Soldiers killed in car blast. *The Sunday Mail*. 18 January 2009; 47
33. Macy E, Apache: The man the machine the mission. *Harper Press*. 2008;31

Physician Assistants in the military: Australian implications

Allan Forde and Dennis Pashen

The contemporary US Physician Assistant (PA) profession arose in the United States of America (US) from a critical need to augment and redistribute the medical workforce in the turbulent mid-1960s. They were then the latest iteration of a model of “delegated practice” which had many historical predecessors dating as far back as the Feldshers in the 17th Century, a Russian military medical assistant model taken up by Peter the Great for the Russian armies.¹ It seems little is new under the sun, just an evolution of ideas and concepts to meet the needs of the time. The American Academy of Physician Assistants (AAPA) provides a concise definition that illustrates how the physician assistant undertakes some of the responsibilities previously only granted to medical practitioners:

“Physician assistants are clinicians who are licensed throughout the United States to practice medicine in association with physicians*. They perform many of the tasks previously done solely by their physician partners, including examination, diagnosis, and carrying out investigations, as well as treatment and prescribing. All physician assistants must be associated with a physician and must practice in an interdependent role, described as “negotiated performance autonomy”.²

PAs practice to a skill set that is *delegated* by the supervising physician and although there is a legislative framework in all 50 states and the federal government, their role is a negotiated and delegated one between physician and PA. Supervision does not necessarily require the physical presence of a physician at the place where services are rendered.²

Initially involved in primary care the role has evolved to specialist care and grown dramatically in areas like emergency medicine, orthopaedics and cardiovascular surgery. The profession experienced an initial period of rapid growth during the 1970s and then substantial expansion in the early 1990s that continues today. The US Bureau of Labor Statistics predicted a 49% growth in PA jobs in the 10 years between 2002 and to 2012 and physician assistants are now the third-fastest growing professional group in the country.³ There are approximately 74,000 practicing PAs throughout the country (compared

to 700,000 physicians).² Not unlike the trend in medicine, there has been a significant gender shift in the PA profession since its inception. Of currently registered PAs, 61% are female and the ratio is nearly 3:1 for PA students.^{2, 4}

Physician Assistants in the US Military

A link between PAs and the US military can be construed as occurring long before US involvement in the Vietnam conflict. In 1942, in the midst of World War II, Dr. Eugene Stead, then the Dean of Emory University Medical School, was asked by the US government to develop an accelerated medical education program to supply doctors for the war effort.⁵ He created a successful three-year program and this experience with condensed medical education would become the educational cornerstone of the PA concept when he initiated the first PA program at Duke University in 1965.⁵

Early physician assistant educational programs principally recruited returning military medics and corpsman from the conflict in Vietnam. The experience of these returning armed forces personnel and their medical officers provided a supportive population for the introduction into the civilian sector of an experienced and skilled health workforce. The intent was to take this predominantly male cohort of veterans with hands-on clinical experience, often in combat and highly adverse circumstances, and rapidly bring them into the primary care workforce. In particular, the focus of this new profession was on the unmet healthcare needs of underserved rural, inner city and indigenous communities. The intense training was attractive to ex-medics, who were used to hard work and had the inculcated discipline necessary to absorb such large amounts of information in such a short period of time.

The US military began to make use of physician assistants in 1971.⁶ There are a number of important reasons the PA concept gained a foothold in the armed services, but the crucial one was the termination of the draft and obligated service for physicians in 1973.⁶

* The terms physician and doctor are used interchangeably in the USA to indicate medical practitioner. For the purpose of this paper *physician* is meant to be inclusive of Australian doctors and physician medical specialists.

An exodus of junior doctors combined with a serious recruiting deficit, at least partially driven by the developing fee-for-service marketplace, led to a much greater reliance on PAs.⁶ Of note, Canadian Forces have also been utilising a “mid-level” provider for over 50 years and with up-skilling began to produce what they called physician assistants in 1984.⁷ Canada now has a civilian PA career track and education system.

The close relationship between Physician Assistants and the US Armed Forces remains strong in 2009. Military PAs serve as commissioned officers and most have received their training from the Inter-service PA Program (IPAP) at the US Army Academy of Health Sciences in San Antonio, Texas.^{6,8} Currently, a workforce of more than 1700 active duty and reservist PAs in the military serve as the backbone of primary care and support some 1,500,000 active duty and 1,260,000 reserve and National Guard personnel.^{6,8} Their medical duties also span a wide variety of specialties and tactical assignments from the more typical clinic and hospital work to ships and forward combat hospitals. While continuing to maintain delegated practice, the role of PAs in combat theatres has expanded to the point that in many instances they have replaced physicians as the front-line care providers.⁸ PAs are now being promoted to field grade ranks and some are assuming command of clinics, medical units and even mobile combat support hospitals.^{8,9}

A Case for PAs in Australia

The physician assistant model as a potential strategy to address medical workforce shortages and maldistribution has gained considerable interest and acceptance among many in the Australian healthcare system. A March 2008 research paper on PAs by the Australian Department of Parliamentary Services Librarians concluded “there is potential to adapt this model to suit the Australian health system so that quality of care and safety in the delivery of services is not compromised”.¹⁰ The state health departments of Queensland and South Australia are currently exploring the concept further, each with 12 month pilot programs employing 14 US PAs in a variety of clinical settings in Adelaide, Brisbane, Mt Isa and Cooktown.

The University of Queensland (UQ) and James Cook University (JCU) medical schools are actively developing PA programs. Both universities will have degree curriculums. The University of Queensland has launched their first intake in July 2009. Similar to the US education model, candidates will be recruited from those with a first degree in a biological science or health field and from the ranks of experienced and properly prepared healthcare workers. Becoming a PA would serve as a much needed career path and means of advancement for skilled medical technicians. Professionals such as ambulance officers, military medics and various allied health workers who are looking for a change in direction or the ability to extend their contribution in the clinical arena would benefit. Leaders in the Australian Defense Force (ADF) and Centers for Veterans and Military Health (CVMH) are attracted by the possibility that up-skilling may serve as a retention tool for military medics (Professor Nikki Ellis, Director, Centre for Veterans and Military Health 16 DEC 2008, Personal Communication). Mature candidates would bring a wealth of past life experience as well as professional skills from their particular disciplines to the PA role. Representatives from CVMH are currently members of the UQ PA program Steering Committee.

Conclusion

Physician Assistants have been an integral part of the US military for a number of years. They have continued to have relevance both in internal military application along with Medics and as a post-military career choice option. Australia has similar issues to which the use and application of the PA model can provide similar answers. However it must be recognised that there are fundamental differences between both health systems which would mean that the model of application of PAs in Australia would need to be an Australian Model similar to, but not necessarily the same as that from the US.

Author Affiliations: 1. Allan Forde, PA-C, MPAS, Senior Lecturer, James Cook University, Townsville Queensland 4811 Australia. 2. Dennis Pashen, MBBS, MPH&TM, FACRRM, Director, Mt Isa Centre for Rural and Remote Health, James Cook University, Mt Isa, Queensland, Australia. Correspondence to: Allan Forde Email. alforde@jcu.edu.au

References

1. Hooker, RS. Cawley, JF. Chapter 2: Physician Assistants in American Medicine 2nd edn., New York: Churchill Livingstone, 2003: 18-19.
2. American Academy of Physician Assistants (AAPA). Homepage. URL <http://www.aapa.org> (accessed 22 July 2009)
3. Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2004-05 Edition, Physician Assistants; URL. <http://www.bls.gov/oco/ocos081.htm>. (accessed 18 June 2008).
4. Physician Assistant Education Association (PAEA). Homepage. URL. <http://www.paeaonline.org/index.html> (accessed 22 July 2009)
5. Physician Assistant History Center. Homepage. URL. <http://www.pahx.org/index.htm> (accessed 22 July 2009)
6. Hooker, RS. Federally Employed Physician Assistants. *Military Medicine*. 2008; 173 (9): 895-899.
7. Canadian Association of Physician Assistants (history). URL: <http://www.caopa.net> (accessed 22 July 2009)
8. Sayler. SW. Continued Growth for military PAs. *JAAPA* (full title of journal) 2002; 15(10):35-39.
9. Scott, D. PA Takes Control of Army Combat Support Hospital, *AAPA News* 30 AUG 2008 29(15) pg 4.
10. Parliament of Australia, Department of Parliamentary Services Parliamentary Library Information, analysis and advice for the Parliament. Health workforce: a case for physician assistants? 25 March 2008, no. 24, 2007-08

Examination Intensive Care and Anaesthesia: Guide to Intensivist and Anaesthetist Training

*Nikki Blackwell, Carole Foot and Christopher Thomas**

**1st edn, 340 p, paperback with illustrations, ISBN 978-0-7295-3802-2 Sydney, Churchill Livingstone (an Imprint of Elsevier), RRP \$83.95, 2006*

Military practitioners have a long association with the world of critical care and anaesthesia. Military practice at times calls upon critical management skills, and there is a considerable proportion of junior Australian Defence Force doctors whose career will take them into these areas.

The primary aim of the book appears to be to help trainees prepare for the Fellowship exams in Intensive Care and Anaesthesia, and it is thus divided into two major sections each dealing with the separate exams and the very different approaches needed for each, followed by areas of "common ground" in data interpretation. Each major section contains subsections dealing with the broad aspects of exam preparation, the format of the exam itself, the common questions and scenarios the candidates are likely to encounter, and landmark (or at least the most frequently quoted) papers with commentaries.

One of the great pleasures of reading through this book was that it does much more than simply offer "exam tips and tricks". The sections on exam preparation contain much useful general advice for trainees in any discipline coming up to any exam. The section on data interpretation is excellent and is great review material. The "key papers" sections have well thoughtout and insightful comments (at least I think so as the reviewer agrees with most of the authors'

interpretations). There are very useful discussions of many common clinical cases presented in potential examination questions and a system is presented for providing answers to such questions which candidates would be well advised to use, at least until they have developed their own style and methods.

There is no attempt to cover the fundamentals of the specialties and this is not the intention of the book. Those looking for a short textbook of intensive care or anaesthesia would be best served looking elsewhere. The necessities of time mean that the newest references are from around 2005, so Fellowship candidates should be expected to have a grasp of newer key papers for the examination.

In short this book achieves considerably more than the title suggests and covers a lot of useful ground outside exam preparation. I would recommend it to all trainees, those who are considering careers in anaesthesia or intensive care, and all of those who are involved in teaching trainees in these disciplines. The book is well priced and deserves a place in individuals' as well as departmental libraries. I commend the authors for an excellent effort and look forward to the next edition.

*Reviewed by: Michael Corkeron, FANZCA FJFICM
Mater Children's Hospital, Brisbane, Australia
SQNLDR RAAFSR*

Therapeutic guidelines: Dermatology*

Dermatology Expert Group.

*Version 3. xxiii+335pp, paperback, ISBN 978-0-9804764-3-9. Melbourne, Therapeutic Guidelines Limited, AUD39.00, 2009.

Apart from textbooks, including one recently received in this journal,¹ there have been few handbooks published specifically on guidelines related to Dermatology. This third Version of Therapeutic Guidelines: Dermatology, part of a collection of 14 in the series of the popular and respected Therapeutic Guidelines series in Australia, is a major step forward in filling this gap. *Therapeutic Guidelines: Dermatology* has a table of Contents, list of Tables, boxes and figures, a list of the members of the Dermatology Expert Group and of the Skin Infections Expert Group, Acknowledgments, a list of Endorsements and Support, About Therapeutic Guidelines Limited and their Board of Directors, a Preface, 27 Chapters, two Appendices, a Glossary, a comprehensive Index and a Request for comment on guidelines proforma. It also includes 24 Tables, 13 Boxes and one Figure.

As is usual in this series, the handbook is compact and, if consistent with others in the series, the reader will expect that updated guidelines would be released every few years. Although skin infections are covered in this instalment of the Therapeutic Guidelines series, it may be useful to consider whether the title should read Dermatology and Skin Infections, as a promotional consideration. The front cover has a basic but functional design, although the significance of the chosen image is not entirely clear. The back cover is virtually blank, except for the ISBN and barcode, and an opportunity has been missed to include a fast find contents list or an overview of the publication; however all of the Therapeutic Guidelines' handbooks seem to take this minimalist approach. Similarly, it may be interesting to make better use of the inside front and back covers, as has been done in other series, such as the Oxford Handbooks, by listing for example major emergencies and the page references to find information to manage them. Each chapter has a useful highlighting strip on the edges of the pages, which importantly helps to identify the various chapters. It is also important to note that the handbook is also available electronically and this would make it very easy to print out patient information sheets, for example.

As an Australian based publication, it is inevitable that the writing group would be predominantly Australian. It is interesting however that all 14 members of the Dermatology Expert Group and all eight of the Skin Infections Expert Group are Australian based. None-the-less, many of these experts would be well known

in the field of dermatology. Apart from the field of pharmacy, there are experts outside of dermatology from fields such as infectious diseases and general practice.

Therapeutic Guidelines: Dermatology is well researched, concise and consistent in its presentation. Chapters include "Skin biopsies and other diagnostic tests"; "Getting to know your drugs", "Acne", "Benign skin tumours and cysts", "Blistering disorders", "Connective tissue disorders", "Contact dermatitis", "Cosmetic dermatology", "Cutaneous drug reactions", "Cutaneous vasculitis", "Dermatitis", "Dermatological emergencies", "Genital skin diseases", "Hair disorders", "Infectious skin diseases", "Infestations and bites", "Itch without rash", "Nail disorders", "Paediatric dermatology", "Pigmentary disorders", "Pregnancy rashes", "Psoriasis", "Rosacea, flushing and perioral dermatitis", "Skin manifestations of internal disease", "Solar damage and skin cancer", "Sweating disorders" and "Urticaria and angioedema". There are also two Appendices, namely "Pregnancy and breastfeeding" and "Sources of information". By far the largest chapter is the one on "Getting to know your drugs" (pages 7-44). The drugs are discussed by sub-headings, namely "Dermatological Vehicles", "Moisturisers", "Antiandrogens", "Antibacterials", "Antifungals", "Antiparasitic Drugs", "Antiseptics", "Antivirals", "Antipruritics", "Biological Antipsoriatic Drugs", "Botulinum Toxin Type A", "Corticosteroids", "Cytotoxics and Immunosuppressants", "Dapsone", "Dithranol", "Eflornithine", "Hydroquinone", "Keratolytics", "Tars", "Vitamin D Analogues", "Zinc Oxide" and "Complementary Medicines". There is no set pattern to the structure of the sections in the guidelines, although most sections cover treatment or management.

Version 3 is a major update of *Therapeutic Guidelines: Dermatology*. There are new tables and boxes on "dosing of oral antihistamines" (Table 1, page 22), "important considerations when using topical corticosteroids in adults and children" (Box 5, page 115), and "indications for lasers and their efficacy" (Table 8, page 79).² From the Australasian perspective, it is hard to fault the guidelines. Perhaps unusual in many similar types of handbooks, it has drawn on both the disciplines of dermatology and infectious disease. One possible omission for those interested in travel and wilderness medicine in more tropical regions of the world would be a chapter on common parasitic and infectious

diseases encountered during travel or expeditions. These might include conditions such as larva currans from *Strongyloides* sp. and eschars from scrub typhus, noting also that many of these conditions also occur in Australia. Another possible omission is that poisonous flora is not well addressed and stinging plants and trees and poisonous plants can present a hazard, even in wilderness areas of Australia. Although it is understood why colour plates have not been included to save cost, some of the topics, such as skin cancer, nail disorders, genital skin diseases and many other areas, lend themselves to spot diagnoses, especially if they included some of the cutaneous manifestations of travel and tropical diseases. More in-depth handbooks, such as the recently published *Handbook of Dermatology: A Practical Manual*,³ would be a useful purchase in addition to this guidelines handbook, which is directed more towards being a rapid therapeutic guidelines reference.

Therapeutic Guidelines: Dermatology is not a substitute for training and experience in dermatology. It is also not meant to be a comprehensive textbook of

dermatology, especially as there have been several good dermatology books published relatively recently, including one relevant to Australasia.⁴ The handbook does however provide an exceptionally useful and fairly comprehensive clinical reference on most aspects of dermatology for the informed health professional, particularly those who are working or will be working professionally in dermatology, general practice and related areas. The book will also appeal to general physicians and other health professionals, who have an interest in dermatology, as well as students and academics involved in dermatology training courses. *Therapeutic Guidelines: Dermatology* has little competition in the guidelines field and is an important guidelines reference handbook in Australasia.

Contact author: Peter A. Leggat, MD, PhD, DrPH, FAFPHM, FACTM, FACRRM, Professor and Head, School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville, Queensland, Australia. E-mail: peter.leggat@jcu.edu.au

References

1. Berth-Jones J, Tan E, Miabach HI. Fast Facts-Eczema and Contact. 1st edn. Oxford: Health Press Ltd., 2004 (Reprinted 2006) (Reviewed *J Mil Vet Health* 2009; 17: 35-36).
2. Therapeutic Guidelines Ltd. News for 2009 March. URL. <http://www.tg.org.au/index.php?sectionid=7> (accessed 31 July 2009)
3. Mann MW, Berk DR, Popkin DL, Bayliss SJ. *Handbook of Dermatology: A Practical Manual*. 1st edn. London: Blackwell Publishing, 2009.
4. Marks R. *MJA Practice Essentials – Dermatology*. 2nd edn. Sydney: MJA Books, 2005.

Queens Birthday Honours

The Australian Military Medicine Association is pleased to note, honour and congratulate the following health professionals in their receipt of the following awards.

Conspicuous Service Cross

Colonel Susan Josephine Neuhaus - SA

For outstanding achievement in the provision of medical support as the Commanding Officer of the 3rd Health Support Battalion.

Lieutenant Colonel Nicole Louise SADLER - ACT

For outstanding achievement as Staff Officer Grade One Strategic Human Resources.

Member (AM) in the General Division

Dr Michael Christoph O'Connor - NSW (Past member, resigned in 2004)

For service to medicine in the fields of obstetrics and gynaecology, particularly indigenous maternal and perinatal health and through professional organizations.

Officer (AO) in the General Division

Professor John Hemsley - PEARN AM RFD - QLD

For service to medicine, particularly in the areas of paediatrics and medical ethics, to medical history, and to the community through injury prevention and first aid programs.

Instructions to Authors

1. Purpose and scope

The Journal of Military and Veterans' Health is a peer reviewed journal published by the Australian Military Medicine Association. The aim of the journal is to promote excellence in the discipline of military and veterans' health, to promote research and to inform and educate all those practicing as health professionals or who have an ongoing interest in this area. The scope of the journal covers all aspects of health of service personnel from enlistment and service within a military organisation to post service health care as a veteran. Environmental and related aspects of employment are included in this scope so that the journal provides a unique forum for discussion and research related to a wide range of health issues arising from exposure to military environments. This scope is very broad including, for example, mental health, trauma, health training and effects of environment on health.

Editorial Office

Please address all non-electronic correspondence to:

Journal of Military and Veterans' Health
113 Harrington Street
Hobart TASMANIA 7000
AUSTRALIA

Email: editorial@jmvh.org

Tel: 613 6234 7844

Fax: 613 6234 5958

URL: <http://www.jmvh.org>

Submission of manuscripts

Electronic submission of manuscripts is mandatory.

Manuscript requirements

Manuscripts submitted to the Journal of Military and Veterans' Health must conform with the *Uniform requirements for manuscripts submitted to biomedical journals* (www.icmje.org).

2. Categories of manuscripts

The Journal of Military and Veterans' Health publishes articles related to health of military personnel and veterans within two broad areas of interest:

Research and practice related	Informative and commentary
Original Research/ Original Articles	Editorials
Short Communication	Letters to the editor
Review articles	Biographies
Reprinted Articles	History
Case Studies	Obituaries
Abstracts from the Literature	Book reviews
	Commentary
	View from the Front

Each issue may not contain all categories of articles. The word limit does not include text in the abstract, references, figures and tables. The requirements for submission categories, which are peer reviewed, are

Category	Maximum word count	Maximum number of	
		Tables and/or figures	References
Editorials	1000	1	3
Original research	3500	6	30
Short communication	1500	3	10
Review article	5000	8	60
Case studies	1000	3	10
Letters to the editor	800	2	10
History	3000	6	20
Commentary	1500	3	10
View from the Front	2000	5	20
Obituaries	200	1	4

Instructions to Authors

Original research

This category is the primary mode in the journal for communication of findings from original research studies.

Short communications

This category is for communicating the findings from small-scale research studies however other subject material will be considered.

Review articles

Authors who wish to submit a review should first contact the editors to determine its suitability for publication in the journal. The editors encourage authors to submit systematic reviews for publication.

Reprinted articles

This section will include full length copies of articles reprinted with permission from other journals. These articles must be keynote and valuable contributions to health issues in the military and veterans' areas. Readers are invited to email details of papers that should be considered for this category. Any proposal should be accompanied by a short commentary (maximum 200 words) outlining why this historical paper was important in shaping some aspect of military or veteran health practice. The commentary will be published with the keynote article.

Case studies

This category is primarily designed to present details of interesting or unusual clinical cases and a summary is required with a limit of 100 words. The text should be presented using the following headings; background, history, examination findings, special investigations, discussion including differential diagnosis. The article should succinctly illustrate important points.

Abstracts from the literature

This category will include abstracts of seminal work published in other journals which is related to the scope of the Journal of Military and Veterans' Health. Readers are invited to email references to papers that are considered to be valuable to healthcare professionals and others in the military and veterans domains. The editors acknowledge that many of our readers may not have facilitated access to comprehensive reference libraries.

Letters to the Editor

Letters may comment on material that has recently been published in the journal or may address new topics, such as use of new equipment or

instrumentation in the field or a new technique applicable to preventive medicine. Where the subject matter is directed towards a previous publication the editors will usually send the letter first to the authors of the original paper so that their comments may be published at the same time as the letter.

Editorials

Submissions are encouraged for publication in this category and these will be subjected to the peer review process. Topics of interest must fall within the scope of the Journal of Military and Veterans' Health. Guest editorials may be invited from time to time by the editor; suggestions for topics for editorials should be directed to the editor.

Biographies

Biographical accounts of the work of individuals who have made outstanding contributions to the health and care of military personnel and veterans will be considered for publication. If you wish to submit a biographical article the editor should be consulted prior to preparation of the article. The editorial board may solicit such articles directly.

History

Articles describing notable themes related to health and care of military personnel and veterans are invited for publication. The scope is broad and could include, for example, the conduct and outcome of military operations, effect of climate, improvements in trauma care, surgical techniques and mental health. The article should focus on health care delivery and practice as the main theme and may compare changes from earlier practice to those in use today. The editorial board may invite such articles directly however if you wish to submit a manuscript the editor should be consulted in advance. The style of this category will be the same as that applied to a review article.

Obituaries

The editorial board will accept obituaries for individuals who have served as health professionals within the Australian Defence Force. These have been very successful in the British Medical Journal (BMJ) to provide information to the wider health readership. Guidance for preparing an obituary can be found on the BMJ web site, www.bmj.com (e.g. *BMJ* 1995;311:680-681 (9 September) and *BMJ* 1995;311:143-144 (15 July)). Obituaries should be submitted within one month of death and will be subject to editing if required.

Instructions to Authors

Book reviews

Reviews of publications which have a direct focus on military and veterans' health for educational, informative, reference or other reasons will be invited. The author/s would be expected to be independent, have considerable experience and/or a track record and a direct involvement in the field which is addressed by the publication.

Commentary

Commentaries will be short articles which provide incisive, informative and balanced comment on current health issues. The editors may invite commentary on a research paper published in the same edition of the journal. All commentary articles will be peer reviewed and the article style will be that of an editorial.

A view from the front

This category will consider submissions from health individuals at the front line of health care and health delivery to serving personnel and veterans. These articles should be topical, recent, may contain an individual's personal view of a health delivery system and will be subject to peer review.

3. Editorial policy

Original material

The Journal of Military and Veterans' Health publishes original work describing health related research studies. Submitted manuscripts must not have been published or submitted for publication elsewhere, either in whole or in part. This applies to both paper and electronic methods of publication but not to abstracts presented to scientific meetings. Authors planning to submit review articles should first contact the Editorial Office to ensure the appropriateness of the subject material.

Disclaimer

While the Editorial Board makes every effort to ensure that no inaccurate or misleading data, opinions or statements are published in the journal, all data, results and opinions appearing in articles and advertisements are the responsibility of the contributor/s and/or the advertiser concerned. Accordingly the Editorial Board and their respective employees, officers and agents accept no liability whatsoever for the consequences of any such inaccurate or misleading data, results, opinions or statements. While every effort is made to ensure that all data are accurately presented, new methods and

techniques should only be considered in conjunction with published literature from manufacturers.

Ethics approvals

All studies that involve participation of humans, information on participants or which would otherwise be considered to require ethical approval related to the principles set forth in the Helsinki Declaration should be conducted in accordance with such principles. Studies of this nature must contain a statement indicating that approval has been granted by a properly established Human Research Ethics Committee.

All studies involving experiments with animals must contain a statement indicating that the protocol *was approved by an appropriately constituted ethics committee or institutional review board in compliance with guidelines* established by that country's government. A statement must be included that indicates that all animals received humane care in compliance with these guidelines.

Confidentiality

Confidentiality must be maintained in relation to all participants. All presented data must be de-identified. If a participant is able to be identified from illustrations, photographs, case studies or other study data then release forms or copies of permission for publication must be submitted with the manuscript.

All potentially identifying information (including patient likenesses, identification numbers, names and initials) must be removed from images, tables, graphs, charts and text before the manuscript is submitted.

If a reference is made in the text to personal communication (oral or written) as a source of information, a signed statement of permission is required from each source. The year of receipt of these statements should be provided in the text. Use of personal communication as a reference will only be accepted in special instances.

Informed consent

A statement must be included indicating that informed consent was obtained from all participants if data were obtained from or were related to human participants.

Authors Process form

Each author must complete this form and forward the original signed copy to the editorial office. A faxed or scanned image may be submitted electronically to

Instructions to Authors

maintain the editorial process however the original completed form must be received by the editorial office before publication.

Copyright assignment

Copyright for each submission is to be assigned to the Journal of Military and Veterans' Health or provision for a licensing arrangement must be completed (*Authors Process* form).

Conflict of interest and funding

Authors are responsible for recognising and disclosing financial and other conflicts of interest that may bias or could be perceived to bias their work. They should acknowledge in the manuscript all financial support for the work including any control over publication by funding bodies and other financial or personal connections to the work. Each author must complete the conflict of interest and funding section of the *Authors Process* form.

Authorship and acknowledgments

Each author must indicate their contribution to preparation of the manuscript (*Authors Process* form). The corresponding author is responsible for ensuring that all individuals who do not satisfy the criteria for authorship are noted in the acknowledgements section together with a brief description of their contribution.

Sole submission

Authors must indicate that the work is original and has not been published or submitted for publication in another journal (*Authors Process* form) as the same or similar material. This includes submission by the authors and their colleagues in the interval before this work is published. Submission by authors of similar material to advertising, news media or other forms of publication must be indicated when the Journal of Military and Veterans' Health receives your manuscript and a copy of that material should be provided with your manuscript.

Peer review

Two or more referees are assigned to review each submission (except for Book Reviews and Reprinted Articles). Acceptance of original articles is based on significance, originality, scientific quality and interest to the Journal of Military and Veterans' Health readership. If the submission is accepted for publication, editorial revisions may be made to aid clarity and understanding without altering the meaning. Authors are given the opportunity to nominate reviewers whom they believe are expert and

impartial in their area of interest.

Offprints

A copy of the final paper will be provided to the corresponding author in pdf format. A copy will be available from the journal website (www.jmvh.org) for interested individuals to download. These copies are made available for single, personal use only and are not available for commercial or other use.

Rights and permissions

Written permission to reproduce any previously published tables or figures must be obtained from the copyright holder (and authors as applicable) and a copy of this permission provided with your submission. Any reproduced material must be clearly identified and its source and permission noted in the manuscript.

Clinical trial registration

We define a clinical trial as "Any project that prospectively assigns human subjects to intervention and comparison groups to study the cause-and-effect relationship between a medical intervention and a health outcome (ICMJE definition). These should be registered, including early phase uncontrolled trials (phase I) in patients or healthy volunteers (WHO Recommendation)".

The Journal of Military and Veterans' Health requires all clinical trials to be registered with a registry that is accessible to the public (at no charge); is searchable using standard, electronic (internet) means; is open to all prospective registrants at minimal or no cost; validates registered information; identifies trials with a unique number; and includes basic information related to the researchers and the trial.

If you are submitting a randomised controlled trial, add the registration number of the trial and the name of the trial registry in the acknowledgements section of your manuscript. Other trial registers that currently meet all of the International Committee of Medical Journal Editors (ICMJE) and World Health Organization (WHO) requirements can be found at <http://www.icmje.org/faq.pdf>.

Registries that meet these criteria include:

- Australian Clinical Trials Registry (www.actr.org.au/)
- US National Library of Medicine (sponsor) (www.clinicaltrials.gov)
- The International Standard Randomised Controlled Trial Number registry (www.controlled-trials.com)

Instructions to Authors

- The National (UK) Research Register (www.update-software.com/national/)
- European Clinical Trials Database (<http://eudract.emea.europa.eu/>)

Language

All manuscripts must be written in English. Spelling and phraseology should be to either standard English or standard American usage and should be consistent throughout the manuscript. Contributors with a non-English native language are encouraged to seek the help of a competent linguist who is familiar with medical terminology prior to submission. It is the author's responsibility to have the language revised before submitting the work for publication. Only minor language revisions are provided after submission.

Review process

Receipt of all submitted papers is acknowledged by email. Manuscripts are initially assessed by the editors and then sent for external review to experts in the field. The corresponding author will be notified by email when a decision is reached. To aid in the peer review process we invite authors to suggest potential reviewers, with their contact details, in the cover letter.

Reproduction of articles, figures and tables

If you would like permission to reproduce an item from material published by the Journal of Military and Veterans' Health, contact the editorial office by email editorial@jmvh.org.

Software and format

The manuscript must be supplied in Microsoft Word in .doc format (Word 2007 file format not accepted at this point in time) or in rich text format. Files prepared in other packages will only be accepted and considered provided they are compatible with Microsoft Word and that *any reformatting is minor*. Files prepared in various desktop publishing proprietary formats will not be accepted.

4. Organisation of manuscripts

Papers will differ in structure depending on category. These instructions refer to sections of manuscripts independent of category where these sections are included. For original research articles the structure should follow the order below with each section beginning on a new page. Reviews should commence with an abstract and then be organised such that the information is presented in a logical sequence with

informative headings and sub-headings related to the content.

Title page

The manuscript should be preceded by a title page which includes the following information:

- Concise title of manuscript
- Name, address, title, highest qualification, affiliation and contact details (email, postal address, telephone and fax) for each author
- Identify corresponding author
- Identify (email) address for correspondence (corresponding author)
- Short running title (maximum 50 characters including spaces)
- Word count (text of paper only – excludes abstract, references, figures and tables)

Abstract

The abstract for original articles should be structured under the following headings: Background, Purpose, Material and Methods, Results, Conclusion. The Background must be a maximum of two sentences. Maximum length of the summary should be 250 words with three to five key words or phrases included below the abstract or summary.

Conflict of Interest

All conflicts of interest must be disclosed in full in this section of the manuscript. These may include, but not be limited to, specific or "in kind" interests, incentives and relationships in respect of the manuscript (e.g. grants, funding, honoraria, stock ownerships, royalties, payment of expenses). This section applies to all authors.

Introduction

It should be assumed that the reader does not have a comprehensive knowledge in the field and you should therefore provide a concise account of the background (including relevant literature references) and reasons for this study.

Materials and methods

Descriptions of any techniques and methods must provide sufficient detail such that a reader can replicate the procedures. Methods that have been published elsewhere should not be described in detail and should be referenced to the original work

Statistics. A full description of the statistical methods used should be provided.

Results

Description of results, while concise, should permit repetition of the procedures and direct comparison with similar data by others. Data should not be repeated unnecessarily in the text, figures and tables and appropriate selection of significant figures for numerical data presentation should be applied. Significance should be expressed as values of probability. Where appropriate, results should be presented as figures rather than tables of data.

Discussion

The discussion should not simply reiterate the results presented; the authors should present their analysis and conclusions with reference to the current knowledge base related to this work. Any assumptions on which conclusions may be based should be stated and there should be some discussion of strengths and weaknesses of the research.

Acknowledgements

These should be brief and should include references to sources of support including financial, logistical and access to material not commercially available. Any individuals named must be given the opportunity to read the paper and approve their inclusion in the acknowledgements before the paper is submitted.

References

A list of references should be provided starting on a new page. Only published references or those genuinely in press should be included.

Tables (including legends to tables)

Tables are to be placed at the end of the manuscript in order of appearance in the text with one table per page. Captions to tables should be short and concise, not exceed one sentence and be on the same page as the table.

Illustrations

These are to be submitted as a separate electronic file for each image.

5. Preparation of manuscripts

Style

References. A standard English dictionary should be used (e.g. Oxford English Dictionary 2007) for spelling or hyphenation of non-medical terms and Dorland's Illustrated Medical Dictionary (WB Saunders, Philadelphia) is recommended for medical

terms. A source for general style including grammar, punctuation and capitalisation is the *Style manual for authors, editors and printers*, Sixth edition 2002 (John Wiley and Sons, Australia).

Numbers. Use numerals for all units of measure and time and for all sets of numbers (e.g. 1 m, 2 hours, 5 years, 4%, 2 of 6 observations). Spell out the numbers one through nine only for general usage (e.g. "we had two opportunities"). Spell out numbers beginning a sentence.

Abbreviations. Abbreviations should be kept to a minimum to avoid confusion with readers who may not be familiar with the subject material. Only standard abbreviations, as listed in a style manual or accepted internationally for use within a subject area, may be used without definition. Terms used frequently within a manuscript may be abbreviated however these should be spelled out at first citation with the abbreviation in parenthesis. Abbreviations in speciality areas must conform to accepted use in that area.

Layout. Headings and sub-headings should be consistent throughout the article and conform to the style used in articles previously published in the journal. No text should be underlined. Prepare the manuscript with double-spacing and allow margins of 2.5 cm.

Tables

Tables should be on separate pages at the end of the paper (following the References section) and be capable of interpretation without reference to the text. They should be numbered consecutively with Arabic numerals (e.g. Table 1). A concise, descriptive caption must be provided for each table. Units in which results are expressed should be given in brackets at the top of each column and not repeated on each line of the table. Ditto signs are not acceptable. An indication should be provided in the manuscript as a guide to indicate where the table should be inserted.

Image files

All images must be submitted as separate files. Images embedded in word processing files are not acceptable. Each image must be referred to in the text and an indication should be provided in the text as to the preferred position of the image. Lettering and lines should be of uniform density and the lines unbroken. Image size and layout should be constructed so that each can be placed within a single column or page width.

At submission all files must satisfy the following criteria for resolution, file format and file size and be

submitted in the actual size to be used. Image width should be constructed to be either one or two column width.

- Halftone images
600 dpi
- Colour images
400 dpi (saved as CMYK)
- Images containing text
600 dpi
- Black and white line art
1200 dpi
- File types
TIF, EPS (JPG and GIF are not suitable)
- Figure width (single column)
-- mm
- Figure width (double column)
-- mm
- Font size
8 point (must be readable after reduction)
- Font type
Times, Times New Roman, Helvetica, Arial
- Line width
Between 0.5 and 1.0 point

Illustrations. These should be referred to in the text as figures (e.g. Figure 1) and numbered consecutively with Arabic numerals. Photographs and illustrations will only be accepted as digital images and should be either composed or cropped before submission to ensure there is no unwanted material in the frame. Digital files judged to be unacceptable in the review process must be resubmitted by the authors.

Graphs, charts and figures. All graphs, charts and figures must be submitted in electronic format (.EPS or .TIF files) and should be prepared by a suitable software package. These should be referred to in the text as figures (e.g. Figure 1). Images of hand drawn material will generally not be accepted. Symbols which are to appear in the figure (and not in the caption) should be chosen from the following available types:

• ◦ ◻ ◼ ▼ ▲ ◆ ◇ + △

Footnotes

The following symbols should be used in the order given to reference footnotes:

* , † , ‡ , § , || , ¶ , ** , †† , ‡‡

References

The list of references should appear at the end of the manuscript. References should be numbered consecutively in the order in which they are first mentioned in the text. References in text, tables and legends should be identified by Arabic numbers and appear in the text in superscript, for example text¹ or text²⁻⁴ or text^{5,6-7}. Where punctuation (e.g. comma, period) follows a reference number then the punctuation should appear after the reference.

The format of references should follow the “Vancouver” style as described in the *Uniform requirements for manuscripts submitted to biomedical journals* (www.icmje.org/). The Journal of Military and Veterans’ Health varies in two respects from these guidelines: Surnames and initials of no more than the first three authors [et al.] are cited and the first and last page numbers of a reference are cited in full. Journal names should be abbreviated as accepted in Index Medicus (<http://www.nlm.nih.gov/tsd/serials/lji.html>) and a period is not used after journal name abbreviations (e.g. J Mil Vet Health). A list providing detailed examples of references for many types of publication is available at http://www.nlm.nih.gov/bsd/uniform_requirements.html. Where appropriate, cite the type of reference (e.g. letter, editorial, abstract or supplement).

Authors should verify references against the original documents and are responsible for checking that none of the references cite retracted articles except in the context of referring to the retraction. For articles published in journals indexed in MEDLINE, the International Committee of Medical Journal Editors considers PubMed (<http://www.ncbi.nlm.nih.gov/sites/entrez/>) the authoritative source for information about retractions. Authors can identify retracted articles in MEDLINE by using the following search term, where pt in square brackets stands for publication type: Retracted publication [pt] in pubmed.

An example of the reference system is as follows:

1. Quail G. Asthma in the military. *Aust Mil Med* 2000; 9(3):129-137.

Units of measurement

The International System of Units (SI) must be used. For values less than zero enter a zero before the decimal point e.g. 0.123. The style should include a solidus e.g. mg/L.

Abbreviations

Use of abbreviations should be minimised. Spell out non-standard abbreviations at their first mention in the text followed by the abbreviation in parentheses. Avoid uncommon abbreviations and jargon.

6. Checklist

Check the following items before submitting your manuscript.

- Covering letter
- Authors Process Form completed by all authors
- Copy of permission to publish material from other sources (copyright holders)
- All individuals named in Acknowledgements have read the paper and approved their inclusion.
- Copy of all permissions to reproduce material from other sources
- All graphs, charts and figures as separate files, referred to in text of paper and position in paper identified
- All illustrations as separate files, referred to in text of paper and position in paper identified
- All tables included, referred to in text of paper and position in paper identified
- Permission obtained for use of *Personal communication* as a reference
- Copies of any part of the manuscript that may have been published previously
- Copies of any advertising or other material that includes any of the submitted material or data
- Statement on ethics approval/s included

7. Submission of manuscripts

Covering letter

Your covering letter should be submitted electronically with the manuscript as a separate file. It can contain author identifying information as it will not be shown to peer reviewers. It should include:

- Why the paper should be published in the Journal of Military and Veterans' Health
- Details of suggested reviewers

Proofs

Proofs will be sent in electronic form as a PDF to the corresponding author who should read them carefully. Major alterations to the text cannot be accepted at this stage. The proofs should be corrected and returned to the Editorial Office by fax or email (image) within 48 hours of receipt.

Software file requirements

The software files must be named so that each is uniquely identified and attributable to your submission. All files submitted should be named to include the following information in the order below:

- Corresponding author surname
- Corresponding author initials
- Title of paper (may be abbreviated)
- Supplementary identifier to indicate contents of file (e.g. for a figure, include *figure* and unique identifier which can be related to that figure).

Examples:

Quail G Asthma in the military Text of paper.doc
Quail G Asthma in the military Figure 1.eps

Electronic submission of paper

The files can be compressed using a .zip compression format. File size must not exceed 10 Mb for a given email. If there are file size concerns contact the Editorial Office.

Copyright Policy

Journal of Military and Veterans' Health (JMVH)
Author Process Form

Each author must read the authorship, licence to publish, conflict of interest and acknowledgements sections of this form and then acknowledge agreement with each section by ticking the check boxes. The corresponding author must also read and sign the statement on the acknowledgements section. Original signed copies of the form must be sent to the JMVH 113 Harrington Street, Hobart.

Your Name (Print): _____

Manuscript Title: _____

Email: _____

Telephone: _____

Fax: _____

Corresponding Author: _____

1. Authorship. Each author must acknowledge their contributions by checking the appropriate statement. An individual must be able to check all boxes in this section to qualify as an author.

I certify that:

- The manuscript presents original, accurate and valid results. I accept responsibility for all subject material and data on which the manuscript is based and for the integrity and veracity of this paper and its conclusions. I may be called upon to defend the veracity of this paper, should it ever be questioned or criticized in part or in full.
- The manuscript has not previously been published (except in abstract form), in part or in total and has not been submitted elsewhere for publications (attach a letter of explanation if part or wholly submitted elsewhere).
- The manuscript shall not be published elsewhere in any language without written consent of the journal and will not be stored electronically or otherwise in any form without consent of the journal.
- If the manuscript has more than one author, the corresponding author nominated above will communicate with the JMVH editorial office to review edited proofs and make decisions regarding the manuscript.

I certify that I have made substantial contributions to the intellectual content of the manuscript for all of the following:

- Conception and design of the study or analysis and interpretation of data.
- Drafting or critically reviewing the manuscript for intellectual content.
- Giving approval of the submitted manuscript.

2. Licence to Publish. Check the appropriate box:

I certify that JMVH has been assigned an exclusive *Licence to Publish* the manuscript in part or in total in printed and electronic form. This licence shall include all parts of the manuscript including text, tables, figures, video, audio and any other related material as:

- The copyright belongs to me.
- The copyright belongs to my employer from whom I have obtained written permission for a *Licence to Publish*.
- The copyright belongs to the funding body/bodies for this work from whom I have obtained written permission for a *Licence to Publish*.
- The copyright for the manuscript and its content belongs wholly in the public domain and no *Licence to Publish* is required.

3. Financial Disclosure and Conflict of Interest. Check one of the boxes below as applicable. The statements refer to the previous five years and the foreseeable future.

I certify that:

- I have no conflict of interest including but not limited to specific financial incentives, relationships or affiliations and have received no "in kind" considerations in relation to this manuscript OR
- I have disclosed all conflicts of interest including but not limited to specific or "in kind" interests, incentives and relationships in respect of the manuscript (e.g. grants, any control of publication by funding body, honoraria, stock ownerships, royalties, payment of expenses) and these are disclosed in full in the Conflict of Interest section of the manuscript.

Your Signature

Date

4. Acknowledgements Section. I certify that (both boxes must be checked):

- Written permission has been provided by all individuals noted in the Acknowledgements section of the manuscript.
- All individuals who have made a significant contribution to the content reported in this manuscript but who do not satisfy the criteria for authorship are noted with their specific contributions described.

Corresponding Author Signature

Date



AUSTRALIAN MILITARY MEDICINE ASSOCIATION

An independent, professional
scientific organisation

**NEW MEMBERS - JOIN NOW
USING OUR ONLINE FACILITY at
<http://www.amma.asn.au/membership>.**

The benefits of being an Australian Military Medicine Association member are:

- Journal of Veterans & Military Health - published four times per year. Contributions welcome.
- Invitation to attend the Annual Conference – held in the third full weekend of October each year.
- Special Interest Groups - Groups are formed for people with specialised interests within the realm of Military Medicine, as interest dictates.
- Regional Groups - Groups will be formed in major population centres as membership develops. Melbourne is active to date.
- Access to literature in the AMMA Library - A well stocked library exists to provide a source of books on the field not readily found elsewhere.
- Opportunity to submit submissions for Grants and Prizes
- All Members receive a membership certificate, and a lapel badge
- Opportunity to purchase AMMA Merchandise

Association Secretariat
Leishman Associates
113 Harrington Street,
Hobart, Tasmania, Australia, 7000
T: +61 3 6234 7844
F: +61 3 6234 5958
E: secretariat@amma.asn.au



AUSTRALIAN MILITARY
MEDICINE ASSOCIATION

www.amma.asn.au

Australian Military Medicine Association Membership Fees

Type of Membership	Price	Once off Joining Fee
NOTE: Period of Membership 1/7/2009-30/6/2010		
Full membership	\$140.00 (GST inclusive)	\$40.00 (GST inclusive)



Do you have an article of interest to our readers?

Authors are invited to submit articles of relevance to the Editor for consideration for publication in the Journal of Military and Veterans' Health (JMVH)

Categories include:

Informative and commentary
Original Research/Original Articles
Short Communication
Review Articles
Reprinted Articles
Case Studies
Abstracts from the Literature

Letters to the editor
Biographies
History
Obituaries
Book Reviews
Commentary
View from the Front

See the JMVH website for authors' instructions and
Submit your article online at www.jmvh.org

JMVH



DISCLAIMER

The views expressed in this journal are those of the authors, and do not reflect in any way official Defence Force policy, or the views of the Surgeon General, Australian Defence Force, or any Military authority