



# AUSTRALIAN MILITARY MEDICINE

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# **Australian Military Medicine Association**

## **Statement of Objectives**

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

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

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

The Association is totally independent of the Australian Defence Force.

## Editorial

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### Once more unto the breach ...

Russ Schedlich

Well, we are at it again. And the greatest test in recent years of our ability to respond and maintain a credible operationally deployed health presence is ahead of us.

No one would be unaware of the recent push into East Timor by a force led by the ADF. Although it has been given little publicity, there is a significant health element involved in ensuring that our personnel, ashore and afloat, are able to quickly access high quality health care in the event of illness or injury.

The Army is leading the push, with what will soon be an augmented Forward Surgical Troop (Heavy) – really a Field Hospital – which will include RAAF elements, providing health care to the Force. Embedded in this hospital, located in Dili, is an aeromedical evacuation capability. Amongst the deployed troops on the ground, of course, are several RAPs providing primary health care.

At sea, the Navy's major ships are fully staffed, with a medical officer on each, so as to allow the ships the greatest freedom to operate without interruption by medical problems.

Linking all this is a joint AME and medical regulating system to allow the smooth transfer of serious casualties, first to Dili then, if necessary, into Darwin. From there, HQ Northern Command takes over, regulating patients into the National Support Area, with strategic AME being coordinated by Air Command.

The entire health care system is the first real operational test of the gamut of capabilities that have been exercised a number of times over the last several years. Perhaps the only thing that has been missing has been the opportunity to deploy the Navy's Primary Casualty Reception Facility, which would have been an ideal means to provide surgical support prior to the full activation of the Field Hospital ashore.

There have been significant and beneficial developments in the area of Reserve conditions of service, brought on by the anticipated demands of both East Timor and the ongoing commitment to Bougainville.

A Civilian Practice Allowance has been introduced to provide a financial offset against those fixed practice costs medical specialists are often required to meet, even when absent from their practices. While there are some significant constraints to the allowance, it is at least a first step towards rectifying a problem that first came to light during the Gulf War, and which has been a festering sore on the ADF's ability to achieve the assurance of Reserve specialist support for operations.

The second major change has been the introduction of a scheme to accelerate entry into the Reserves for medical specialists willing to volunteer for duty in either East Timor or Bougainville. This scheme bypasses the normal selection process, requiring simply that the specialist meets the ADF's needs and is professionally suitable, and is medically and physically fit for deployment. Entry is for the limited and specific purpose of operational deployment, but specialists who join under this scheme will have the opportunity to undertake the full selection process after deployment if they wish to continue to serve in the Reserves.

So everything looks rosy. But if we need to maintain two operational health deployments over an extended period of time, will we have the resources to maintain them?

Rotation will be a requirement for both Reserve and Permanent Forces, the rota for the Reserves obviously much more frequent than for the Permanents.

Will we see Reserve specialists doing a number of rotations because of lack of depth in numbers? – if so, what will be the effect on morale?

Will the three arms of the Defence Health Service have the range and depth of personnel to meet their rotational requirements? Clearly, there will be the ability for Navy as well as RAAF and Army health personnel to rotate into the Field Hospital, but with diminishing uniformed numbers of Permanent health personnel, the pool to draw from is not as big as it has been.

Will Defence be able to bear the cost of the necessary outsourcing caused by lack of uniformed personnel in the National Support Areas? In these times of, continuing, financial constraint, how financially healthy will the Defence Health Service remain?

We do indeed live in interesting times.

*Russ Schedlich*

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## President's Message

Nader Abou-Seif

Over the last few years, as one reads the morning paper, watches the news or listens to the radio, one cannot help but notice the presence of a situation or crisis which requires humanitarian assistance of direct military health support. This century has seen a growth in both the opportunities to practise military medicine and a greater ability to respond by its practitioners.

In my musings prior to writing this, two thoughts have come to me. The first of these is that the choice of a title for this year's conference in Adelaide – 'The 1900's – Yesterday, Today and Tomorrow' is more than just an opportunity to reflect on military medicine in the last century. It is a reminder that the demands on our predecessors and ourselves by a century of conflict and disaster have encouraged us to develop skills and use resources that earlier generations of those practising military medicine could not imagine. I wish to take this opportunity to invite you all to join me in Adelaide on October 8<sup>th</sup>-10<sup>th</sup> for our Eighth National Conference and what promises to continue a tradition of excellent meetings.

My second reflection is that there is great deal of untapped resource in our association. We have a wealth of knowledge and experience among our members – some have

achieved an eminence that they justly deserve. Others however do a wonderful job, but receive no recognition in the wider health community. Perhaps they do their job so well that they are not noticed – how often do we notice someone more easily if the job is not being done properly?

It is my hope that AMMA provides an environment in which the skills, experience and knowledge of all of our members are recognized. We have a choice of avenues to learn from the experience of others, to contribute our thoughts and ideas, and by doing this to enhance our own knowledge and skills.

The fellowship of our Association has always been something that has been evident at our meetings. I hope that our efforts continue to bear fruit, and encourage a level of involvement that will reinforce the strength of our Association and maintain and enhance the quality of our meetings.

As ever, any organization is only as strong as the involvement of its membership and our continued attendance at national and regional meetings, presentations and contributions to *Australian Military Medicine* can only make our Association both richer and stronger.

Here's to a successful future.

### AMMA Awards for 2000

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# Articles

## The complete military surgeon<sup>1</sup>

J.V. Rosenfeld<sup>2</sup>

The prime task for the military surgeon at the 'sharp end' of a military operation is to provide 'initial wound surgery' which is that emergency surgery required to maintain an airway, and quell major haemorrhage, and therefore save lives which otherwise would be lost. This is classified as Level 3 medical support and should ideally be performed within 'the golden' first hour of injury but preferably within three hours, which is a more realistic goal for the military scenario. It also includes initial debridement of wounds and stabilisation of fractures.

The military surgeon must therefore have knowledge and experience in the management of trauma, including the metabolic response to injury, and have knowledge of the effects of burns, missile and blast injuries, and their treatment. They must also be able to operate within any cavity of the body, and deal with the acute problem within it, to explore and debride an injured limb, and if necessary amputate the limb or apply external fixateurs to a compound fracture or to an unstable pelvic fracture. There should be a familiarity with the principles and techniques of vascular surgery.

More advanced, specialised surgery (Level 4 or 5) theoretically has no place in this environment and patients needing this level of care would be transferred by strategic aeromedical evacuation (AME) to a tertiary centre in Australia or its equivalent in another country.

However, ADF operations will increasingly involve Peacekeeping and Low Level Operations and are likely to include humanitarian support. Based on recent experiences of Level 3 medical support provided on Peacekeeping and Monitoring Operations by the ADF in Rwanda<sup>1</sup> and Bougainville respectively, a much wider repertoire of operations and clinical decision making is required of the surgeon. This may necessitate some

Level 4 and even Level 5 surgery to enable the completion of the treatment process and return of the individual to their family and society.

This surgery may include such subspecialties as plastic and reconstructive surgery, facio-maxillary surgery, neurosurgery, vascular surgery, burns surgery, paediatric surgery, obstetrics and gynaecology, urology and a wider range of orthopaedic surgery. How can the surgeon being trained today be expected to cope with this myriad of procedures?

### Military Surgical Training

General practice does not provide the necessary qualification or range of skills to perform military surgery. We believe that a postgraduate surgical qualification (FRACS or its equivalent) is a prerequisite for a military surgeon. However, surgery today is becoming increasingly sub-specialised. A trainee in general surgery may have minimal training and experience in trauma management and trauma surgery, and may eventually practise with a limited repertoire of highly specialised regional procedures, for example breast surgery or upper GIT surgery.

The same strictures apply to many of the other surgical specialties and many recently qualified specialist surgeons have had minimal experience with general surgery and often no experience with the other surgical specialties. In Australia, the trauma surgery experience is diminishing, firstly because of effective preventive strategies, and secondly because of the concentration of serious trauma cases in trauma centres. This lack of general and trauma skills and experience would place these surgeons at a distinct disadvantage when faced with the broad challenges facing the military surgeon.

<sup>1</sup> Rosenfeld JV. The complete military surgeon. *Aust Mil Med* 1999; 8(2):3-5

<sup>2</sup> Jeffrey V. Rosenfeld MBBS, MS, FRACS, FRCS(Ed), FACS, FACTM. Lieutenant Colonel. Jeff Rosenfeld RAAMC is the Associate Professor, Department of Surgery and Paediatrics, the University of Melbourne, Director, Department of Neurosurgery, Royal Children's Hospital, Melbourne and the Deputy Director, Department of Neurosurgery, The Royal Melbourne Hospital. He trained in general and neurosurgery and joined the Army Reserve in 1984 and is currently SO1 in the Regional Health Personnel Agency Victoria. He has served with the ADF in Rwanda and Bougainville.



The rural surgical training program of the Royal Australasian College of Surgeons provides a very broad training and background for an aspiring military surgeon who would be expected to treat civilians during Peacekeeping Operations as well as battle casualties in military personnel. A period or Fellowship doing general trauma surgery, which may be obtained in trauma centres either in Australia or overseas, is also a highly desirable training option for the Australian Military Surgeon.

The ADF should offer some encouragement through scholarships or return of service agreements to facilitate these goals. Once the surgeon is qualified, a model of military service could be developed which included some part-time civilian surgery in private practice or as a trauma surgeon within a civilian trauma centre.

### **Future Approaches to Surgical Support**

The electronic age has enhanced communication over long distances with aids such as satellite telephone, teleradiology, videoconferencing, E-mail, digital photography and electronic transfer of the images via the Internet. The surgeon when faced with an unfamiliar clinical situation may rapidly seek advice through a bank of specialists at 'home' enabling the surgeon to use his or her general surgical skills to adequately treat the condition.

The more experienced colleague may offer a solution or plan of investigation and treatment for a particular clinical problem which may not be readily apparent to the surgeon 'on the ground', and the surgeon may be guided through the steps of the operation if unfamiliar with it. This can be a tremendous confidence boost and allow the surgeon to obtain excellent results in unfamiliar clinical situations.

The ultimate in battlefield assistance is the telerobotics systems where robotic arms perform battlefield surgery controlled by the surgeon performing the 'virtual' surgery at a distance.<sup>2</sup> These systems are still in the development phase and will need accurate tactile feedback and excellent imaging systems to be practicable.

### **Definitive Surgical Trauma Course**

The Definitive Surgical Trauma Course (DSTC) was held for the first time in Australia in 1999 (apart from the pilot course). The DSTC course is not a substitute for the Early Management of Severe Trauma Course (EMST) of the Royal Australasian College of Surgeons which remains an essential prereq-

uisite for any medical practitioner managing trauma.

It is designed to train the general surgeon in the rapid decision making and operative treatment required to manage severe trauma to any area of the body. It includes didactic presentations, case discussions, human cadaver dissections, and surgery in the animal laboratory. The operative approaches include thoracotomy, craniotomy, and exposures of the large blood vessels in the neck, chest and abdomen which are not common targets for the general surgeon, but which may all be required in managing trauma. 'Damage control' surgery is emphasised in the course and this has particular applicability to the military scenario.

Australian and New Zealand military surgeons should be encouraged to do the course and in time it may be feasible to add a military module to the course as has been done in the United States. It would also be appropriate to develop military surgery modules for paediatric surgery and obstetrics and gynaecology that are also encountered frequently on peacekeeping operations.

The proposed establishment of a Chair of Military Medicine should facilitate the academic development of Australian military surgery and assist and even coordinate the training of the military surgeon.

### **Surgery in the Field**

The Forward Surgical Troop is the smallest surgical unit in the Australian Army (apart from the unique Parachute Surgical Troop) and has equivalents in the Navy and Air Force. The manning includes a general and orthopaedic surgeon and each can assist the other.

As there are likely to be many limb injuries on military operations, the presence of an orthopaedic surgeon is appropriate. Acute knee injuries could be aggressively treated in the area of operation using arthroscopy, thus preserving manpower. Brigadier R. Atkinson has demonstrated that this can be done in a remote surgical facility in northern Australia. It may not always be possible to have the two surgeons together so that the generalist will still need to have familiarity with acute orthopaedics.

### **Conclusion**

The difficulties of producing the complete military surgeon in today's environment of super-specialisation have been highlighted and some solutions offered, but in the final

analysis, nothing can substitute for an extensive clinical and operative experience.

# References:

1. Farrow GGB, Rosenfeld JV, Crozier JA, Wheatley P, Warfe PG. Military surgery in Rwanda. *Aust NZ J Surg* 1997; 67:696-702
2. Satava RM. Robotics, telepresence and virtual reality: A critical analysis of the future of surgery. *Minimally Invasive Therapy* 1992; 1:357-63

## Basic life support. Military background and influence in contemporary teaching of cardiopulmonary resuscitation<sup>1</sup>

J.H. Pearn<sup>2</sup>

### Abstract

Cardiopulmonary resuscitation (CPR) is the core component of both Basic Life Support and Advanced Life Support skills. Modern first aid, as a discipline of drills and skills to preserve life and limb, had its genesis in military surgery albeit with a history of barely two centuries. The extension of teaching of first aid skills to members of the lay public was the result of advocacy of military surgeons initially in London in 1878 and subsequently in Australia from 1881. The Australian Defence Force was a foundation member of The Australian Resuscitation Council which was established under the auspices of The Royal Australasian College of Surgeons in 1976; and since that time uniformed members have maintained a significant influence in the sequential development of the policies and practice of CPR teaching in both the military and civilian domains in Australia. This paper reviews the range of high-risk scenarios that may confront any individual, uniformed or civilian, where on-site CPR may be required at any time. The historic and contemporary close links which exist between uniformed health personnel and those of The Australian Red Cross, St John Ambulance Australia and The Royal Life Saving Society are reviewed in this paper. Continued advocacy of "first aid - a skill for all" remains core doctrine for all members of the Defence Health Service Branch within The Australian Defence Force.

**Key Words:** Cardiopulmonary resuscitation (CPR); Australian Defence Force; Defence Health Service Branch; first aid; military medicine; teaching CPR.

The series of drills and skills that we understand today as cardiopulmonary resuscitation (CPR) has a history of barely two centuries.<sup>1-3</sup> The development of the doctrine and the teaching of life support skills owes much to military surgeons. Baron Larrey in the Peninsula Wars, von Eschmarch in Prussia in 1851, and Holger-Nielsen in Paris in 1943 each developed principles of self-help and buddy-help, primarily for sick and injured soldiers, on which the concepts of later twentieth century life support techniques have been built (Table 1, over page).

The best discoveries and inventions will not save lives unless bystanders and first-responders are trained in the delivery of the system. The military was the fundamental catalyst that enabled the new discoveries of life support to be disseminated to the general civilian public.

When the Imperial troops were removed from Australia in 1870, six of the States developed their own militia volunteer forces, each responsible independently to the Crown in London. Four of these militia forces developed their own Ambulance Corps.

<sup>1</sup> Pearn JH. Basic life support. Military background and influence in contemporary teaching of cardiopulmonary resuscitation. *Aust Mil Med* 1999; 8(2):5-12

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In Melbourne, Surgeon-Major Robert Robertson delivered four public lectures on military first aid between March 1880 and February 1881.<sup>3</sup> His unit, the St Kilda Artillery – established to defend the city of St Kilda in Melbourne – opened its teaching classes (segregated by sex) to the public in a pioneering move that was soon to have reper-

cussions throughout Australia. The first civilian ambulance service in Australasia, The City Ambulance Transport Brigade, was established in Brisbane in 1892,<sup>4</sup> modelled along the lines of and containing many cross-posted positions of the militia Ambulance Corps of the Queensland Defence Force.

1851	Friedrich von Esmarch invented the self-help bandage - an unbleached calico triangle with a base of 40 centimetres; to be carried by all Prussian soldiers in battle. This was the first introduction of the concept of every individual being responsible for his and a colleague's treatment following an injury.
1861	Henry Silvester's development of a "physiological method of resuscitation". <sup>62</sup>
1897	Professor Edward Sharpey-Schaefer's further development of a resuscitation method – patient face-down with head turned to the side. <sup>63</sup>
1943	Holger Nielson's method – victim placed face-down with elbows bent, with the rescuer applying alternating pressure to the thorax with the raising of the victim's elbows. Holger Nielson was a Danish soldier who served with the German occupying Army in Paris during World War II.
1948	Human heart restarted electrically for the first time. <sup>63</sup>
1958	Dr Peter Safar's demonstration, using curarized volunteer medical students, that expired air resuscitation will maintain adequate cerebral perfusion of oxygenated blood. <sup>1</sup>
1984	Development of semi-automatic (computerised) defibrillator.
1988	Tore Laerdal developed the concept of "Chain of Survival" – a four-link chain comprising Calling for Help, Basic Life Support, Advanced Life Support, In-hospital Life Support. <sup>4,5</sup>

Table 1: A chronology of some milestones in the evolution of best-practice Basic and Advanced Life Support.

Subsequently, the evolution of lay teaching,<sup>2,3</sup> and the development of pre-hospital systems of trauma care,<sup>6-8</sup> developed into a history of the lay teaching of CPR which has proved to

be as important as that of the technical discoveries and the development of new equipments themselves (Table 2).

1870	Imperial Troops withdrawn from the Australian Colonies. Six Australian Colonies established their own State Defence Forces. Four of these included a Military Ambulance Corps whose members taught volunteer militia stretcher-bearers the skills of bandaging technique and the elements of resuscitation.
1880	The medical section of the St Kilda Artillery (Melbourne) opened its classes of military first aid drills to the general public. <sup>1</sup>
1883	The first public St John Ambulance First Aid Courses taught - at the Everleigh Railway Workshops in Sydney; and in Melbourne, this latter under the auspices of Dr James Neild (1824-1906). <sup>1</sup>
1892	The first civilian ambulance service established - the City Ambulance Transport Brigade -in Brisbane. <sup>64</sup>
1892	Several Australian States establish State Railway Ambulance Corps to protect the life of both staff and passengers on State Railways.
1894	Royal Life Saving Society established in Australia - this within three years of its establishment by William Henry in London in 1891.
1907	The Surf Life Saving Association founded, originally termed The Surf Bathing Association of New South Wales. <sup>1</sup>
1914	Australian Red Cross founded within days of the outbreak of the First World War. Terms of Reference included advocacy for international humanitarian law, the protection of prisoners and refugees, the provision of food and shelter to civilians at times of civil and military emergency and the teaching of first aid. <sup>1,65</sup>
1976	The Australian Resuscitation Council formed and sponsored by the Royal Australasian College of Surgeons, in Melbourne. <sup>61</sup> The Defence Health Service of the Australian Defence Force was a Foundation Member, and has served as an influential full member since that time.

Table 2: Military Role in the Teaching of First Aid. Some datum milestones in the chronology of teaching Basic Life Support skills to the general Australian public.

All who work in the area of both training and delivery of pre-hospital CPR feel an identity,

indeed a justifiable pride, in being a part of this vigorous development for the better pres-

ervation of life. An auditor of life support would, however, point out some chastening contemporary facts. Such are the sobering realities of the new millennium:

- Less than 20% of cardiac arrest victims, in developed countries, receive bystander CPR.<sup>9</sup>
- Survival following cardiac arrest due to ventricular fibrillation is only 9%.<sup>10</sup>
- Survival rates following cardiac arrest in neonatal septicaemic shock remain zero.<sup>11</sup>
- Best-practice survival (40%) for cardiac arrest are associated with call-to-shock times of 5.6 minutes; with non-survivors having a mean call-to-shock response time of 6.9 minutes. Yet best-practice, median response times in metropolitan Australia (some of the best professional ambulance responses anywhere) are 9.5 minutes.<sup>13,14</sup>
- Only 1.5% of Australians are trained in first aid each year.
- First responders, including doctors in hospital,<sup>15</sup> and CPR instructors,<sup>16</sup> do not like performing mouth-to-mouth resuscitation.
- The majority of doctors (UK figures) have received no CPR training in the last five years.<sup>17</sup>
- Only 38% (NZ figures) of junior paediatric doctors know that cardiopulmonary arrest in children is almost always due to hypoxia or apnoeic events.<sup>18</sup>

What are the portals by which CPR survival can be improved? The military has a major potential role in this field. This paper discusses some approaches to this issue.

### Children – An Audit of Preventible Deaths

Children have comprised a significant component of the clinical contacts involving health personnel in Australia's recent overseas deployments. Can child mortality be reduced by a higher rate of better quality, parent and bystander CPR in the community? The overall causes of child mortality in Australia are shown in Table 3.<sup>19-23</sup>

• Road trauma <sup>19,20,21,24,25</sup>
• Inter-vehicle crashes
• Bicycle trauma <sup>26</sup>
• Pedestrian run-downs
• Drowning <sup>19,20,21,28-31,57</sup>
• Burns <sup>21,27</sup>
• Non-accidental Injury, homicide <sup>21,57,66</sup>
• Suffocation <sup>19,20</sup>
• Accidental poisoning <sup>22</sup>

Table 3: The ranked causes of child trauma mortality in Australia.

Any reductions in childhood deaths, using CPR as one engine for improvement, must therefore focus particularly on road trauma, drowning, burns and mechanical suffocation.<sup>21</sup> Although accidental poisoning is common in the 1-3 year age group in Australia and New Zealand, it is very rarely fatal;<sup>22</sup> and in the case of the Sudden Infant Death Syndrome (SIDS), which kills 1 in every 700 children in the first year of life, the dead infants are almost always found hours rather than minutes after death,<sup>23</sup> and extensive anecdotal experience suggests that CPR, unlike the preferred face-up sleeping position for infants, will do little to reduce deaths from this enigmatic disease.

Road trauma kills children as occupants of cars,<sup>24,25</sup> as the result of bicycle trauma,<sup>26</sup> and as victims of pedestrian run-downs. An extensive autopsy analysis of Australian child road trauma victims, undertaken in my own research unit, has shown that better accident-site maintenance of the airway will save perhaps an extra 8% of such victims.<sup>24</sup> In this study, 48% of 1,369 children killed on the road had significant facial trauma and 33% of these had aspirated blood or foreign material prior to cardiac asystole. Similarly, a recent study of fatally burnt children, as part of the Brisbane Child Trauma Study, has shown that 5% could probably be salvaged by airway clearing and maintenance in the pre-hospital phase.<sup>27</sup>

It is in the area of accidental drowning that the greatest window-of-opportunity exists for further CPR-driven mortality reduction. Drowning in Australia continues to cause a third of all deaths in the 0-4 year old group;<sup>20</sup> and the rate, always high in the past two decades, continues as one of the highest by international comparison.<sup>28</sup>

My own research in the Brisbane Drowning Study has shown that 30% of toddler drowning fatalities can be turned into survivors, simply by the first responder having been trained in CPR.<sup>29,30</sup> I believe the rea-



son for this is not simply the better technical CPR delivered by a trained first responder (almost always a parent, grandparent, sib, neighbour or child carer), although such is very important. I believe such improved survival is due also to the fact that trained first aiders are more likely to initiate CPR earlier than those who have never attended a basic life support course. A number of those resuscitators, accidentally "on-the-spot", were ADF or ex-ADF personnel who had been trained in first aid. The difference between potential fatality on the one hand and salvage on the other is a brain hypoxic time of less than 5 minutes in this age group.<sup>30,31</sup>

Timely and skilled CPR not only saves lives, but it saves brains in survivors. Although 97% of near-drowning survivors do not have hard neurological signs,<sup>30,32</sup> one third have some impairment of the islets of higher intellectual functioning. Such chronic hypoxic damage is measured by wide subscale disparities on formal psychometric testing of survivors.<sup>33</sup> The "urgency of immersions", as a major preventable cause of toddler mortality and morbidity, remains topical in all tropical and subtropical countries of the

developed world, as the new millennium commences.<sup>34</sup>

### Children - Cardiopulmonary Arrest

Almost all paediatric cardiopulmonary arrests are due to hypoxia,<sup>11,18</sup> irrespective of whether such arrests involve neonates, infants or older children.<sup>11</sup> Cardiac dysrhythmias are rare and account for less than 5% of cardiac arrests that affect neonates who require CPR;<sup>11,18</sup> and less than 8% of children up to the age of 15 years who suffer cardiac arrest.<sup>35</sup>

The principal causes of cardiac arrest in children are SIDS, drowning and asthma. Studies of 12,490 persons with cardiac arrest treated by the Ambulance Service of New South Wales have shown that in the case of children under 5 years of age, defibrillation for ventricular fibrillation (VF) comprises less than 0.02% (9 of 5,047) of all cases of VF. In current practice, even with high rates of pre-hospital paramedic-administered defibrillation, young children with VF have zero survival.<sup>35</sup>

A summary of realistic salvage, by improved first-responder CPR, which involves child victims, is shown in Table 4.

Potential Extra Salvage (Percent)		
Road trauma	Airway clearance	8% <sup>24</sup>
Drowning	Skilled CPR	30% <sup>29-32,36,38</sup>
Burns	Airway clearance	5% <sup>19,27</sup>
Non-accidental Injury		0% <sup>66</sup>
Sudden Infant Death Syndrome (SIDS)		0% <sup>23</sup>
Electrocution, suffocation		3% <sup>19</sup>
Accidental poisoning		0% <sup>22</sup>

Table 4: An estimate of the percentage of extra children salvaged, by improved accident-site Basic and Advanced Life Support, if lay first responders are trained in first aid.

How can these potential improvements be translated into practice? How can motivation or legislative requirements for CPR be improved? Two obvious suggestions are (a) current first aid certificates should be a requirement for the issue of all new driving licences; and (b) a current first aid certificate should be held by all owners of swimming pools. Such requirements have long been suggested,<sup>36-39</sup> but one maintains an unapologetic advocacy concerning their desirability. The young heart is a great substrate for CPR. In the case of neonates who have suffered a cardiac arrest precipitated by an acute and reversible event, 64% will survive CPR to leave hospital.<sup>11</sup> Our analyses as part of the Brisbane Trauma Study suggest that the corresponding figure for infants and older chil-

dren exceeds 35%, and that more than 95% of these will have intact brains.

Seven of the last ten of Australia's international operational deployments have involved humanitarian health care of indigenous children in Africa, Asia and Papua New Guinea. All servicemen and women - not just military doctors, dentists, nurses and medics - need to be skilled in paediatric CPR, just as they are in adult life support skills.

### Pre-Emptive Action - Early Recognition of Symptoms

Cardiopulmonary resuscitation will be inevitable for many potential adult victims of cardiac arrest. One way of improving the success of CPR is to delay those factors that precipitate its necessity from out-of-hospital sites

to a place where skilled techniques with on-site defibrillation are available. This apparently cold-blooded, but realistic approach means better education of the public about premonitory signs and symptoms of diseases that will progress to cardiac arrest. Dr Ian Banks, chair of the [U.K.] Men's Health Forum, notes that:-

"Survival figures from heart attack could be trebled if people knew how to recognise the symptoms and act appropriately ... heart attacks are not always dramatic events and the early symptoms often go unrecognised or are explained away as indigestion or tiredness".<sup>40</sup>

The [UK] Doctor Patient Partnership has joined forces with the Men's Health Forum and the British Heart Foundation to launch the campaign entitled "Chest Pain: What men should know". Clinical details in lay-friendly language have been placed in the *Angling Times* and in the programmes of four premiership football games. Currently, on-site defibrillation teams of St John Ambulance Australia personnel who support the public at the Australian Football League (AFL) in Melbourne have highlighted the particular risks of football-crowd excitement to the cardiac arrest-prone group. Successful resuscitation rates for VF, exceeding 45%, have been achieved and long-term survival follow-up rates are awaited with great interest.

A similar approach - first aid training to promote the earlier recognition of symptoms before out-of-hospital cardiac arrest occurs - offers a hope of reducing the need for CPR, and of increasing post-CPR survival rates for children with cardiac complication of bacteraemic shock. First aid classes offer an important portal of teaching about the natural history of serious illness in all age groups. Currently, in-hospital CPR success rates for children who sustain cardiac arrest in bacteraemic shock remain close to zero.<sup>11</sup>

### High Risk Adult Patients

One obvious stratagem to ensure that first-responders are trained in CPR is to target the families of high-risk patients. Although such seems obvious,<sup>41</sup> in practice the students in first aid classes tend to be younger adults or those in the occupational work force. Training needs to be targeted to those who are most likely to be bystanders at a cardiopulmonary arrest.<sup>42</sup>

A good place to start is with doctors themselves, whose relatively poor performance of CPR skills has been described in sev-

eral studies.<sup>43</sup> General medical practitioners and hospital doctors are frequently called upon to perform CPR, usually on patients in the GP's surgery, during therapy sessions or sometimes in X-ray departments.<sup>44</sup> The initial survival rates from such are high,<sup>43</sup> a testament to the value of early bystander CPR, a factor independent of quality reperfusion of the hypoxic brain and heart.

One area where high-risk patients occur in a closed environment is that of international air travel. In-flight and in-terminal incidents requiring first aid are not uncommon.<sup>45</sup> In 1995, 1.5 billion passengers flew on the world's commercial airlines; and of these four million suffered sudden illness or were injured and required first aid.<sup>46</sup> The number of air passengers is expected to double by 2005.<sup>46</sup> Currently, 1,000 lives are lost annually, in-flight, from cardiac arrest on the world's commercial aircraft.<sup>47</sup> Until Qantas' pioneering use of in-flight semiautomatic defibrillation,<sup>48</sup> most US and Australian carriers diverted to the nearest airport after in-flight cardiac arrest. In spite of this (expensive, disruptive but altruistic) policy, no passenger survived asystole or idioventricular rhythm (IVR). Within five years of the introduction of in-flight semiautomatic defibrillators (with flight attendants trained in their use) by Qantas in August 1992, the monitoring defibrillator had been used in 46 cases of cardiac arrest which had occurred in-flight or at an airline terminal. Twenty-three of these had VF, and of these 6 (26%) have been long term survivors.<sup>48</sup> My personal experience with St John Ambulance Australia courses for defibrillation is that a major benefit is the window-of-opportunity which is opened to reskill the drills of airway clearance, expired air resuscitation (EAR) and external cardiac compression (ECC). Military personnel in uniform, travelling in the air, have an inescapable duty to help with in-flight emergencies.

Matching potential patients together with potential resuscitators, the latter equipped with automatic defibrillators, is a challenge to all charged with the community training of CPR. The St John Ambulance Australia programme, "Every Parent a First Aider", exemplifies this point.<sup>49-51</sup> The most obvious group for targeting for improved CPR training comprise the partners of older subjects who are at high-risk for cardiac arrest. Research has shown, however, that motivation to learn CPR skills is not naturally or spontaneously high in this group of "at risk relatives".<sup>41</sup> This is probably because of ego-defence mechanisms of denial of the potential risk of death in a loved one, or for aesthetic



reasons, or perhaps because of a fear of potential failure should one's skills be insufficient to save the life of a loved one. Whatever are the reasons, the potential matching of high-probability resuscitators with their CPR instructors remains an unmet challenge in the contemporary Australian community.

### Elitism and CPR

There is an attitude abroad that the drills and skills of CPR are somehow the province of the medical domain, rather than being a skill of equal validity and status for every citizen; and for every serviceman and woman. Such an attitude also exists in some groups within the Defence forces. Studies have demonstrated consistently that it does not matter who administers CPR.<sup>12,47,52,53</sup> Paramedics achieve the same or better survival results when compared with doctors, and trained fireman and police have the same success rates as ambulance officers. In doctor-lifesaver teams on the Australian beach, trained surf lifesavers act with equal validity as the principal with the doctor as assistant.<sup>53</sup>

In the Brisbane Drowning Study one third of rescuers were older children;<sup>29-31,33</sup> and in two instances in which I was professionally involved, it was pre-adolescent sibs who had been coincidentally trained in Royal Life Saving Association classes at school, who unquestionably successfully resuscitated apnoeic and pulseless victims whom they had pulled from the water. The need for CPR training in secondary schools, long advocated,<sup>30,54</sup> remains the exception rather than the rule. An exception are the splendid rescue and resuscitation training programmes conducted by the Royal Life Saving Society of Australia. Video and multi-media self-training CPR programmes have the potential to reach some individuals unlikely to participate in traditional classes.<sup>55</sup> Peter Safar, the founder of expired air CPR in 1958, has noted 40 years later that it is the motivation and skill acquisition of all members of the public which has the current highest priority - higher even than some of the minutiae of the hands-on CPR techniques themselves.<sup>56</sup>

### Prevention

In one sense, the need for CPR is a failure - a failure of preventative approaches. In that CPR offers a second chance for life itself, it offers afresh a second chance of effective prevention. This applies as equally to the potential victims of myocardial infarction as it does to the apparently drowned child pulled from a back garden swimming pool. In the context of

severe trauma there are three portals for primary prevention:

- education and public media campaigns;<sup>37</sup>
- better ergonomic design to reduce potentially fatal hazards in the environment;<sup>36</sup> and
- safety legislation.<sup>57</sup>

First aid and improved systems of pre-hospital care are a fourth portal of prevention. Such is secondary prevention; and from the purist point of view of public health, in one sense such attempt to shut the stable door on death after the spark of life has all but bolted.

If one takes childhood drowning as an example, we have been able to identify 16 potential links in the drowning chain of any individual child.<sup>38</sup> Such start with a toddler wandering into the vicinity of an unprotected water hazard and end with a non-responding hypoxic heart in asystole in the emergency room of the local hospital. This "hypoxic march" can be reversed at any step between the moment of voluntary breath-holding to the final point of irreversible hypoxic brain damage.<sup>30</sup> Effective and timely bystander-operated CPR does not prevent the drowning episode in the first place; but, from the victim's point of view, recovery with an intact brain is all that matters. If this is achieved through secondary prevention - good CPR - then that is all that matters.

### Preventive First Aid

CPR as secondary prevention of death or hypoxic brain damage is a concept distinct from that of preventive first aid. This latter term,<sup>59</sup> first coined in 1989,<sup>60</sup> has as its fundamental ethos the philosophy that a component of all CPR and first aid courses should contain an explicit, preventative module. There are as yet no reported studies to show the preventive effectiveness of CPR courses that would withstand the audit of the contemporary demands of evidence-based medicine. However, experience of injury reduction following saturation first aid courses in the mining industry in Tasmania and in the timber industry in Canada are very encouraging indeed in this regard. Many volunteers who attend courses of first aid are by their nature caring and concerned individuals who have already recognised the risks; and are by nature just the sort of person who will take steps to reduce hazards which might lead to the necessity for CPR. In other words, there may not be a direct cause-and-effect relationship between CPR training and subsequent reduced rates

of illness and injury. Much research needs to be undertaken in this area. Currently, Rotary International in Australia is promoting a triennium of research that will offer an opportunity to study further the preventive power of CPR. That body, together with the 16 organisations which comprise the Australian Resuscitation Council,<sup>61</sup> do much to reduce the need for CPR in the first place. The Aus-

tralian Defence Force is one of these component organisations which acknowledges that life-support skills, when needed, respect no rank, corps, posting or status. For those who are confronted with an apnoeic or pulseless casualty, skilled resuscitation offers the wondrous opportunity of reigniting the spark on which we all depend.

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# History

## Kitchener's Hundred<sup>1</sup>

John C. Trinca<sup>2</sup>

In the first week of March 1915, the Board of Management of Melbourne's Alfred Hospital was stunned by the sudden resignation of the Medical Superintendent and three of the four Resident Medical Officers. To comprehend why these otherwise responsible young men should have forsaken the last couple of months of their contract, it is necessary to go back to the early days of the First World War.

On 6 August 1914, two days after Great Britain declared war on Germany, Field Marshall Lord Kitchener took over the seals of the War Office from Prime Minister Asquith. Both sides expected a short conflict lasting from three to six months because by that time, it was assumed, most of the warring nations would be bankrupt. Of all the British politicians and military strategists, Kitchener alone foresaw a long struggle ahead. He predicted that the war would last at least three years and planned accordingly for a huge army. Events on the battlefields soon indicated that Kitchener's vision was no illusion.

Between 19 October and 22 November 1914, the British Expeditionary Force (BEF) sustained appalling casualties in the First Battle of Ypres, losing four-fifths of its original troops. By the end of that year the BEF had suffered further heavy losses during many futile attempts to regain lost ground in Belgium and France against fierce artillery barrages and withering machine gun fire. Early in 1915, it became apparent that Britain could not maintain adequate medical services for both its expanding army and its civilians without help from the Dominions. Already, some Australian doctors, who had been studying in England when war broke out, had enlisted in the Royal Army Medical Corps (RAMC) during the latter months of 1914, but many more would be required if Kitchener's planned army of seventy divisions were to receive adequate medical support.

On 8 February 1915, the British War Office, through the Australian High Commissioner, dispatched a cable to the Australian Defence Department requesting one hundred medical practitioners as soon as possible for service with the RAMC in Europe. The Minister of Defence, Senator Pearce, sought the assistance of the universities in obtaining the necessary medical officers. The university authorities cooperated by bringing forward the final year examinations, and advised the Minister that there were many members of the profession not in regular touch with the universities who would be prepared to make sacrifices for their country. On 26 February, Senator Pearce issued a lengthy statement, published the next day in all the leading newspapers. The Melbourne *Argus* ran these headings:

"DOCTORS FOR THE FRONT.  
100 WANTED AT ONCE.  
WAR OFFICE CALL."

The recruits were required to be single men, under forty years of age and medically fit. The terms offered were:

"First-class passage to and from England; outfit allowance of 37.10s; rank of lieutenant (temporary) in Royal Army Medical Corps; pay 24s per diem and rations, and bonus of 60 at conclusion of term of service if carried out satisfactorily; service to be for twelve months or the term of the war. ... They will be sent by mail steamer or transport as most suitable. It is hoped that a considerable number will be able to leave next week."

All medical students who passed their finals were asked to offer their services to the Defence Department or to arrange to relieve RMOs so that they could go to the front. The Minister recognised that, as a result of the

<sup>1</sup> Trinca JC. Kitchener's Hundred. *Aust Mil Med* 1998; 8(2):13-21

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War Office call, many hospitals would encounter difficulty in obtaining a sufficient number of RMOs, but he believed that 'all medical men will feel that the call of their country comes first'.

In the same press statement reference was made to instructions issued by the Acting Director-General of Medical Services that fourth and fifth year medical students were not to be enlisted in the ranks of any Australian units. However, despite this injunction, three fourth year students (J.N. Brown, W.E.J. Harrison and R.F. Le Souef) did manage, subsequently to join the AIF. They were among the 46 Melbourne University medical students who enlisted in 1915 (see *Chiron*, Vol. 2, 1989, p51). All three were recalled to finish the course.

The *Argus* kept the public informed of the progress of the War Office appeal by publishing articles under the heading 'DOCTORS FOR THE FRONT'. On 6 March 1915, it reported that already three doctors (Ashley, Lorimer and McShane) had left for England, and printed the names of another nineteen (including the four RMOs who had just resigned from the Alfred Hospital) who had been accepted for active service on behalf of the RAMC. This article went on to say that the defence authorities knew that a number of medical students about to sit for their final examinations were most anxious to go on active service. On 13 March the Honorary Secretary of the Medical Students Society called a meeting of final year students at the Melbourne Hospital to discuss the call for doctors and to take the names of intending volunteers.

On 17 March, the *Argus* highlighted Sydney University's response with these headlines:

"MEDICAL STUDENTS VOLUNTEER.  
SYDNEY'S FINE EXAMPLE."

It was reported that Sir Thomas Anderson Stuart, Dean of the Medical Faculty:

"... had taken a very keen interest in securing the medical students for active service, and his delight may be well imagined when in response to the call 43 out of the 60 'passes' stood out and volunteered for immediate service. The result of the call in Sydney has given the greatest satisfaction to the military authorities, and it is recognised that if the response at the other universities is proportionate to that made in Sydney the necessary 100 doctors will be raised in a fortnight".

Among those who graduated in Sydney and volunteered for service with the RAMC were two women, but the British War Office was quick to inform the Australian Government that it could not 'utilise' the services of women doctors. In 1916 the shortage of medical officers in the armed forces became so acute that the War Office was obliged to reconsider its position regarding women medical officers and invited medical women to join the RAMC (see *Chiron*, Vol 2, 1990, p51).

Twenty-eight of the 73 who graduated MBChM\* at the University of Sydney in March 1915 became members of an elite group which came to be known among themselves as 'Kitchener's Hundred'; some enlisted on the very day their degree was conferred. A further fifteen, ten of whom graduated in 1914 and five in 1913, made up the 43 representatives from the University of Sydney. Five members of Kitchener's Hundred (J.B. Dawson, C.F. Drew, R.B. Lucas, H.J. Penny, and B.W. Wibberley) had graduated from Adelaide University and three (T.E. Ashley, R.O. Bridgman and W.C. Marsden) had British qualifications.

In Melbourne on Thursday, 1 April 1915, at a special ceremony performed by the Vice-Chancellor, Dr J.H. MacFarland, fifteen successful medical students were presented by the Dean, Professor Sir Harry Allen. After the conferring Sir Harry said that all of the young men had been accepted for service in France with the RAMC and would be leaving Australia by the next two mail steamers. Ten of the fifteen were actually at sea when the annual conferring of degrees took place on 17 April 1915. The remaining five, together with two who graduated *in absentia* at the main ceremony, were on their way to England before the end of the month. One other medical graduate of that year was included in the Hundred, making a total of 18 out of 51 men and five women who qualified MBBS (Melbourne) in April 1915.

Although the rank and pay were inferior to those pertaining in the Australian Army, the War Office call was no less appealing to some of the 1914 graduates who were shortly to complete their hospital residency. As noted previously, the Alfred Hospital management was particularly inconvenienced when four of the five members of the resident staff resigned in the first week of March 1915. At the outbreak of war the Alfred Hospital's resident medical officer (RMO) staff comprised a medical superintendent (MS), one senior medical officer (SMO) and four junior medical officers (JMO). When the Medical Superintendent (R.S. Whitford) en-

listed in the first month of the war, R.M. Clarke, the SMO, assumed the office of MS, but on 1 March 1915, he resigned in order to respond to the urgent appeal of the Imperial War Office and informed the Alfred Hospital Board of Management that he would be leaving in two days. During the same week, three of the remaining four RMOs (N.H.M. Puckle, C.T. Stephen and H.C. Colville) likewise resigned and left the hospital at short notice to join the RAMC. The Board of Management, while recognising the serious inconvenience that such short notice on the part of four members of the Resident Medical Staff involved, resolved to let them go as they desired. At the Melbourne Hospital, where the resident medical staff comprised an MS and ten RMOs, two of the latter (C. Chechi and H.R. Dew) sought, and were granted, leave of absence from their duties for the remainder of their term of office on account of war service with the RAMC.

The sudden resignations at the Alfred Hospital left A.H. O'Hara Wood as the sole RMO. He acted as MS until July 1915, when he left for England to join the Royal Flying Corps (RFC) in a non-medical capacity. Arthur Holroyd O'Hara Wood had been a brilliant student at Melbourne Grammar School where he passed eight matriculation subjects at the age of 14, won the Government Prize for Science, gained First Class Honours at Matriculation and was equal Dux of the School with H.C. Colville (qv) in 1908. At the University, his brilliance as a scholar was equalled by his prowess on the sports field. He was a triple University Blue in tennis, cricket and rifles, and despite his intensive involvement in College and University sports, obtained Honours and the Forensic Medicine Prize in final year. At tennis he was outstanding being, in turn, University, Victorian and Australasian champion. O'Hara Wood saw the possibilities of aviation and believed that he would be of greater service to the Allied cause as a flying man than as a medical officer. He served with great distinction in the RFC, became a flying instructor and was mentioned in Despatches. While leading a patrol above St Quentin one month before the Armistice his aircraft was accidentally hit by another RFC machine and he was killed.

Cedrick Alwyn Stewart, the next MS at the Alfred Hospital became another tragic war casualty. He was a JMO at the Melbourne Hospital before spending two years as MS at the Alfred Hospital. In final year he performed brilliantly, obtaining First Class Honours in all three major subjects of Medicine, Surgery and Gynaecology, sharing the Exhibition in

Surgery. He gained his MD by research in cerebrospinal meningitis undertaken with Neil Hamilton Fairley. He enlisted in the AAMC in February 1917, and was killed by a high explosive shell in France in April 1918. Stewart's successor was H.C. Colville, one of Kitchener's Hundred, who returned after completing one year's service with the RAMC.

Kitchener's quota of one hundred medical men was quickly filled and all left Australia before the end of April 1915. The great majority sailed in groups on the passenger liners *Mala*, *Medina*, *Mongolia*, *Orontes* and *Orsova*. A few travelled on the *Ballararat* and *Morea*. Three were appointed medical officers, for the voyage only, to the *Runic*, *Argyllshire* and *Star of England*. R.O. Bridgman, appointed the Medical Officer to the *Star of England*, was injured in an explosion and had to be replaced by M.J. Gallagher. Bridgman rejoined the RAMC later and sailed in the *Malwa*.

Although the Director General of Medical Services (DGMS) announced on 8 April 1915, that the selection of one hundred medical men for the RAMC had been completed, his office continued to receive many requests to join the RAMC. When informed of these requests, the British War Office expressed pleasure at the prospect of a second hundred RAMC Australian doctors, but there was no further official appeal for volunteers.

Exactly half (50) of the members of the Hundred had attended the University of Melbourne, including W.C. Marsden who completed his course in England. A further 47 Melbourne graduates joined the RAMC - some were undertaking postgraduate studies in London or Edinburgh when war erupted, while others travelled independently to England, preferring service abroad to uncertain enlistment at home. Herbert Moran, for example, dreaded being in camp in Australia for a long heart-breaking period, so decided to go to London by the then quickest route, via USA. Two of Kitchener's Hundred, J.W. Farrar and A.J. Trinca, had already seen service in the Royal Australian Navy on the Hospital Ship *Grantala* which took part in the action at Rabaul in September 1914.

Several members, after completing their contract with the RAMC, joined the AAMC. One, H.A.C. Wall, after being invalided to Australia from Lemnos, regained his health and again responded to the call to arms. He re-enlisted in the RAN and saw further service in the Mediterranean. Some were still fit and active at the outbreak of the Second World War and offered their services again. Outstanding among those was Charles Hux-



table, MC & Bar, who at the age of 48, joined the AIF (13 AGH), was captured in Malaya and survived the agonies of being a Japanese POW, despite contracting tuberculosis.

Cyril Checchi, today the sole surviving member of Kitchener's Hundred, left the Melbourne Hospital three weeks before his residency was due to end. He was one of a group of twenty Melbourne doctors who sailed on the *SS Orontes* to join the RAMC. They left Melbourne on 14 April 1915, travelling first class as civilians and were required to dress for dinner each night. The ship was unescorted and there were no wartime restrictions. It was like a peacetime voyage with the passengers enjoying all the luxuries. They were in the Mediterranean when the landing at Gallipoli took place. After disembarking at Plymouth, they travelled by train to London where they were not expected and nobody seemed to know what to do with them. Eventually the Australian Agent-General found them accommodation. They were given a week's leave, during which time they were outfitted with uniforms. They then went to the RAMC training unit at Crookham, near Aldershot, and some were fortunate enough to be billeted in private homes near the camp. The training was strict - drill starting at 6 am, route marches, horse riding classes, but no clinical work.

Another group underwent similar training, except for the riding classes, at the Field Ambulance group at Eastbourne. Dr Cecil Gordon McAdam, one of the fifteen to graduate at the special ceremony in Melbourne on 1 April 1915, recorded his experiences in a diary from the time of his embarkation on the *Morea* on 20 April until his departure from Eastbourne for the front on 31 August 1915. To McAdam it was a 'great adventure' with 'duty the key'. He was accompanied by five other RAMC recruits (R.W. Hogg, J.D.H. Hughston, C.H. Lloyd, R.B. Minnett and A.E. Stenning). The voyage took exactly six weeks and was uneventful. His medical activities consisted of smallpox vaccination and typhoid inoculation of members of the crew and the treatment of occasional minor illnesses. Prickly heat was a common complaint and McAdam himself was severely affected by it. While travelling through the Suez Canal they heard that the *Medina*, which was ahead of them and carrying fifteen of the Hundred, had narrowly missed a Turkish mine.

After landing at Tilbury, McAdam spent a week in London sightseeing, ordering his uniform and arranging pay, before travelling, with his five companions from the *Morea*, to

Eastbourne, where they were attached to E Division 54<sup>th</sup> Field Ambulance. Here they came across several other members of the Hundred. They were quartered in two-man tents and each had a batman, who prepared a daily bath at 6am. There was an hour's drill before breakfast, then lectures interspersed with field work. The lectures were on sanitation, hygiene, 'diseases affecting troops', correspondence in the field, military law, law of evidence, courts martial, organisation of the British Army, duties in hospitals, gas defence, field work, accoutrements, field ambulance work, ambulance equipment and map reading. The field work included exercises, drilling and marching, stretcher drill for collection of the wounded, semaphore drill, learning bugle calls, wagon drill, tent pitching and striking, digging latrines, urinals, grease traps and incinerators.

There was a stir at the camp when it was reported erroneously in the Australian press that Roy Minnett, the former Test cricketer, had been killed in action at Gallipoli. Minnett was very much alive at Eastbourne and cables were hastily sent to rectify this shocking mistake. Minnett was the last Australian to leave Eastbourne for the front and survived the war.

A special Act of Parliament was passed in the House of Commons to legalise the medical registration of McAdam and those other members of the Hundred who had left too hurriedly for Australian registration to be effected. With respect to his commissioning in the RAMC, McAdam proudly noted in his diary dated 21 June 1915: 'I was gazetted in *The Times* today'. Towards the end of July, McAdam was seconded at short notice to the Transport Section of the War Office to relieve the medical officer in charge of the transportation of wounded men arriving at Victoria Station.

Major Dunhill, an Australian who was later to become Sir Thomas Dunhill and Surgeon to the King, was McAdam's superior officer at the Victoria Street office. Among the 33 wounded Australians from the Dardanelles was Colonel G.A. Syme, who was suffering from cellulitis of the arm. One of McAdam's less arduous assignments was the delivery of a letter to Buckingham Palace, believed to contain an invitation for the King to visit Harefield Park, a convalescent hospital for wounded Australians.

On his return to Eastbourne, McAdam was bitterly disappointed to find that all his fellow Australians, with the exception of Minnett, had already left with their ambulances for the front. Some time previously, Cliff

Scantlebury was mistakenly included in a group of Canadians ordered to the Mediterranean at short notice. The authorities discovered the mistake, but Scantlebury insisted on going and ended up at Cape Helles. Three others, C. Checchi, N.L. Prichard and H.A.C. Wall, also served with British units at Cape Helles during the disastrous Gallipoli campaign. Cyril Checchi remained on the Gallipoli peninsula until the successful evacuation of all forces in December 1915. He subsequently enlisted in the AAMC, but his service with the RAMC was not recognised and he found himself junior in rank to many who joined up after him or had been on the Reserve awaiting training, let alone having seen active service.

Many times in his diary McAdam expressed frustration at the delay in posting him to the front. He was often very homesick and sometimes philosophical: 'If I fall I shall have done all that I can do for my Country and I shall have given all I can give. The sacrifice can never be too great.' McAdam served with the RAMC on the Western Front, Salonika and Palestine and had attained the rank of major at the time of his demobilisation in August 1919. He was in France in September 1915 during the memorable Battle of Loos, where he estimated that the British casualties were 60,000. He was wounded at Salonika and invalided back to Australia, but later returned to the Middle East and was Medical Officer at a prisoner of war camp for Turks when the war ended.

After completing the training at Crookham or Eastbourne, the newly-fledged Australian members of the RAMC were posted to various British Army units. Most of them went to front-line field ambulances operating in the battlefields of France or the Balkans. Some served in casualty clearing stations, hospitals or on hospital ships, while others acted as regimental medical officers. Several served in more than one of the main theatres of war - Flanders, Salonika and Mesopotamia. At least three (G.A. Birnie, W.A. Bowman and F.E. Keane) underwent the ghastly experience of Passchendaele in 1917. Birnie, who had two lengthy stints in the front line and was severely wounded on each occasion, has left a vivid account of the appalling conditions under which the infantry fought in France. Early in 1916, after his regimental aid post received a direct shell hit, Birnie notes:

"It was a ghastly business. I think there were about eight of us, mostly wounded men we had been dealing with, and my sergeant and myself, but there were only two survivors - one

soldier who lost an arm, and myself with a G.S.W. wound left shoulder."

After recovering from this wound Birnie returned to France, spent some time at an uncongenial Stationary Hospital, and was then posted to a front-line regiment which was subsequently decimated in the futile Allied offensive at Passchendaele. Birnie recorded that on the day 830 men of his regiment went 'over the top', only 94 were not killed or wounded. He received a bullet wound in the neck and was awarded the Military Cross for his courageous efforts in alleviating the wounded under heavy fire on the day 'our battalion was sacrificed'.

The awards for bravery and the decorations won by this select group of one hundred make an impressive list. No fewer than twenty were awarded the Military Cross (including two bars), seven were mentioned in Despatches; there were, also, one Distinguished Service Order, one Croix de Guerre with Palm, one Medaille d'Honneur and one Italian Silver Medal for Military Valour. Of the fifty Melbourne members, 11 were wounded on the field of battle and two were gassed; five of these were invalided out of the Army as a result. One such was Reginald Morley Clarke who, as previously mentioned, resigned abruptly as Medical Superintendent at the Alfred Hospital to join the RAMC. During devoted service in France with the British Expeditionary Forces, Clarke's health was seriously undermined by prolonged exposure to poison gas and he was declared unfit for active military service. He died suddenly in January 1921, leaving a young family of three. His two sons, Maurice Vivian Clarke, CBE, and Denis Morley Clarke, became distinguished members of the medical profession in Melbourne.

Another invalided out of the RAMC was Oswald Barton, a graduate of the University of Sydney and a son of Sir Edmund Barton, the first Prime Minister of the Commonwealth of Australia and, subsequently, a Justice of the High Court. In a letter to the Acting Prime Minister, Senator Pearce, dated 9 May 1916, Mr. Justice Barton expressed concern that his son Oswald, who, having regained his health after spending many arduous months in the British trenches and desiring to join the AAMC, would not have his service with the RAMC recognised in terms of seniority. Barton's request to have such British service equated with AIF service was turned down. At an earlier date, 1 April 1916, the Australian Defence Department received a cable stating that a number of Australian Medical Officers who had completed one year's service with



the RAMC, wanted to enlist in the AIF in England. The matter was referred to the DGMS who stated in a minute to the Secretary of the Defence Department dated 20 April 1916:

"... If we begin accepting Australian Medical Officers in England for the AIF, similar procedure might be pressed in the case of other Australians in the branches of the Imperial Army for the object of obtaining higher rates of pay and pensions. It would also block promotion of men now serving with the AIF."

Since the AIF then had sufficient medical officers for its needs, the Australian doctors serving abroad with the BEF were informed that if they wished to transfer to the AAMC they would have to return to Australia and be placed on the AAMC Reserve with seniority from that date. It is no wonder that Justice Sir Edmund Barton was constrained to write in his letter of 9<sup>th</sup> May:

"It would be beyond measure strange if he could not now take service with the Australian Section of his countrymen. For the British Isles are the origin of all of us, and the Empire is our common country."

Several outstanding sportsmen were among Kitchener's Hundred, including Test and Sheffield Shield cricketers, league footballers and State tennis players. Roy Baldwin Minnett played for Australia in nine Test Matches in 1911-12. He made 90 in his first Test, sharing a sixth-wicket partnership of 109 with Victor Trumper. He was top scorer in two other innings in the 1911/12 series. Charles Francis Drew played League Football with North Adelaide and represented South Australia in both cricket and football. Norman McAlister Gregg represented New South Wales in both cricket and tennis and was in the team captained by his hero, Victor Trumper, which toured Tasmania early in 1915. Ernest Robertson represented Victoria in tennis. Several others received University

Blues or featured prominently in College teams. In rifle shooting, Henry Cecil Colville was champion of the University of Melbourne.

Two Melbourne members of Kitchener's Hundred were killed in action, namely, Johnston D.H. Hughson (at Salonika in September 1918, after being wounded in France) and William Rogerson (by shrapnel in France in August 1918, previously mentioned in Despatches). Two Sydney members (N.W. Broughton and A.C.A. Jekyll) died on active service. R.B. Lucas, an Adelaide graduate, died of wounds in a German hospital shortly after being taken prisoner in 1916. Of the ninety-five who survived the war, some remained in England after the termination of their service with the RAMC. One of these was Raymond William Ryan who joined the Royal Air Force Medical Service when it was formed in 1919. Subsequently, he became Air Commodore and President of RAF Medical Boards. In the Second World War, Ryan was successively the first Director of the Royal Canadian Medical Services, Air Officer Commanding the Central Medical Establishment, and later Medical Adviser to the Guild of Air Pilots. Another was Norman Edward Packer, who was killed in a riding accident whilst serving with the British occupation forces on the Rhine in 1922.

Of the fifty Melbourne doctors selected for Kitchener's Hundred, 14 served for one year in the RAMC, 9 served two years, 14 served three years and 12 served four years; the service record of one (M.E. Robinson) has not been located. M.H. Sorokiewich, one of the fifteen to graduate at Melbourne on 1 April 1915, changed his surname to Southwick on his return to Australia at the end of 1918.

After completing one year's satisfactory service in the RAMC, the doctors were duly promoted to Captain, but remained inferior in rank to their AAMC colleagues who were commissioned Captains and became Majors on first promotion.

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The great majority of Kitchener's Hundred returned to Australia where many of them became leaders of their profession:

A. (Archie) S. Anderson, CBE, MBBS, DOMS, FRCPs: Ophthalmic Surgeon, Vice President, Victorian Eye & Ear Hospital; Foundation Chairman, Ophthalmic Research Institute of Australia; Ormond College Council; Board of

Management, Victorian Eye & Ear and St Andrews Hospitals.

G.A. (Alec) Birnie, MC, MDBS, DPH (Eng), FRACP: Physician, Alfred Hospital; Council Vic. Branch, BMA.

E.P. Blashki, MC, MBChM, FRACS: ENT Surgeon, Royal North Shore Hospital.

B.M. Carruthers, OBE, MBChM, FRSanI: Director, Tasmanian Hospital & Medical Services.

C.K. Cohen, MBChM, FRACS: Ophthalmic Surgeon, Sydney Hospital.

K.G. Colquhoun, MDBS, FRACP: Dermatologist, St Vincent's Hospital, Melbourne, and Repatriation Department.

H. Cecil Colville, KB, MBMS, FRACS: Paediatric Surgeon, Alfred Hospital; First President, AMA; Gold Medallist BMA and AMA.

Harold R. Dew, KB, Medaille d'Honneur, MBBS, FRCS, FRACS: Professor of Surgery, Uni. Sydney; Surgeon, Royal Prince Alfred Hospital; Hunterian Professor, Jacksonian Prize, Royal College of Surgeons; Syme Prize, Uni. Melb.; Sims Travelling Scholar; wrote authoritative books on hydatid disease and malignant tumours of the testicle.

Charles F. Drew, MC, MBBS: BMA Council, South Australia, Vice-President.

Norman McA. Gregg, KB, MC, MBChM, DOMS, FRACS, FRCOG, FRACP: Ophthalmologist, Royal Prince Alfred and Royal Alexandra Hospitals, Sydney; President Ophthalmological Society of NSW; Shorney Prize; James Cook and Addingham medals; Britannica Australia Award in Medicine; discovered the link between maternal rubella and foetal abnormalities - the Gregg syndrome.

C.R.R. Huxtable, MC & Bar, MBChM, FRACS (Edin): Royal Flying Doctor Service; Officer of Rhodesian Legion of Merit.

C. Gordon McAdam, MBBS co-founder of Lord Somers Camp and Power House; Honorary MO YMCA.

W.S.(Bill) Newton, KB, MDBS, FRACP: Physician, Board of Management, Alfred Hospital; Faculty of Medicine; council member RACP; Anti-Cancer Council; Consultative Council on Tuberculosis.

L.J.J. Nye, MBChM, FRACP: Physician, Brisbane General Hospital; Council Queensland Branch of BMA & AMA; Member University of Queensland Senate; Prisoners Parole Board.

Alan Pryde, MBBS: Surgeon, Launceston General Hospital; President Tasmanian Branch of BMA.

H.N.M. Puckle, MBBS, FRCS (Edin), FRACS, Italian Silver Medal for Military Valour: Surgeon, Victorian Eye & Ear Hospital.

S.W.G. Ratcliff, OBE, MBChM: Chief Executive Officer, Royal Alexandra Hospital, Sydney; Consultant NSW Hospitals Commission; Chairman, NSW Consultative Council for Physically Handicapped.

G.C. (Cliff) Scantlebury, MBS, FRCS (Edin), FRACS: ENT Surgeon, Royal Melbourne Hospital.

J.G. Sleeman, MDBS, FRACP, FCCP: Physician, Royal Adelaide Hospital; CMO Tuberculosis Services.

Alfred J. Trinca, MDBS, FRCS, FRACS: Pathologist & Surgeon, Alfred Hospital; Anti-Cancer Council; Consultant, Baker Institute.

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The complete list of Kitchener's Hundred follows.

G.G. Adams, A.S. Anderson, J.T. Anderson, C.H. Armitage, T.E. Ashley, O. Barton, G.A. Birnie, W.A.H. Birrell, E.P. Blashki, W.A. Bowman, A.W. Bretherton, R.O. Bridgman, N.W. Broughton, G.C. Bury, B.M. Carruthers, R.B. Carter, C. Checchi, R.M. Clarke, B.W. Cohen, C.K. Cohen, K.G. Colquhoun, H.C. Colville, L.B. Daly, E.P. Dark, J.B. Dawson, H.R. Dew, J.L. Digby, C.O.G. Donovan, C.F. Drew, W.A. Edwards, J.F. Fahy, C. Farren-Ridge, J.W. Farrar, D.F. Finlay, A.D. Forbes, M.J. Gallagher, T.E. George, W.E. Giblin, W.H.

Godby, N.McA. Gregg, C.M. Harris, W.S. Hawthorne, W.A.L.H. Henderson, R.W. Hogg, J.D.H. Hughston, C.R.R. Huxtable, J.I.M. Jamieson, A.C.A. Jekyll, F.E. Keane, C.H. Lloyd, F.H. Looney, G.N. Lorimer, R.B. Lucas, C.G. McAdam, J.B. MacCulloch, C. McShane, W.C. Marsden, C.H. Martin, A.H. Melville, R.B. Minnett, F.H. Moran, J. Morlet, A.W.G. Murray, W.S. Newton, L.J.J. Nye, J.J. L'Neill, N.E. Packer, H.J. Penny, L.M. Pigott, E.T. Pinhey, F.W.A. Ponsford, N.L. Prichard, A. Pryde, H.N.M. Puckle, S.W.G. Ratcliff, A.W.



Raymond, G.A. Renwick, R.W. Richards, A.T. Roberts, E. Robertson, M.E. Robinson, E. Rogerson, W. Rogerson, R.W. Ryan, G.C. Scantlebury, J.G. Sleeman, M.H. Sorokiewich, A.E. Stenning, C.T. Stephen,

F.W. Stone, N.C. Talbot, A.J. Trinca, C.A. Verge, G.D.K. Waldron, H.A.C. Wall, H.W. Ward, A. Weigall, B.W. Wibberley, W.F.S. Yeates.

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#### Author's note:

I first came upon Kitchener's Hundred when searching for information about my father's war service (*Chiron*, Vol. 1, 1987, p.24). I never heard him use the term, so I was surprised to find it mentioned in an obituary to Jack Morlet who was among the twenty RAMC recruits, including my father, who left Melbourne in the *Orontes* on 14 April 1915. Subsequently, I found three other references to Kitchener's Hundred:

Dr C.R.R. Huxtable (*Med J Aust* 1956; 2:86) in an obituary to Dr Jack Morlet wrote: "... As an old friend, and as a fellow member of Kitchener's Hundred, as we used to call ourselves, ..."

Dr. Kevin Byrne (*Med J Aust* 1950; 1:200) in an obituary to Dr Charles Huxtable wrote: "He was recruited into the British Army as one of 'Kitchener's Hundred' young doctors sought from overseas."

I became fascinated by the story and in the months that followed I managed to trace the names and careers of this unrecognised group of Australian doctors. When I searched the Roll of Honour at the Shrine of Remembrance I was disturbed to discover that the names of thirty-seven of the fifty Melbourne members of the hundred were missing, presumably because they spent their entire war service with the British Army. Furthermore, the Australian Army Records Department has no record of their service with the RAMC and the War Office in England lost many of their records during air raids in the Second World War. Thus, there are only the documents held in private family collections to prove that these gallant men ever volunteered and served overseas in the Allied Forces.

Cyril Checchi and the fellow Australians who served with British units in the Dardanelles campaign were not considered eligible for the Gallipoli Medal awarded to the Anzacs who fought on the Gallipoli peninsula. The Australian authorities denied Checchi's requests for recognition and it was only through the efforts of RSL Victorian President, Bruce Ruxton, that sixty years later Cyril Checchi, CBE, became the proud owner of the Gallipoli Medal.

Although Alfred Trinca acted as Surgeon Lieutenant on the Hospital Ship *Gran-*

*tala* and wore the uniform of a RAN Officer, he was classified as a civilian surgeon and not given a service number. His active service with the Australian Navy is not recognised and his name consequently does not appear on the Honour Roll at the Shrine of Remembrance, although he devoted four years of his life in the service of the Allied cause. The British Ministry of Defence has no record of his three-year service with the RAMC, as is revealed in the letter, dated 27 July 1987, from the Departmental Record Officer (Archives):

"We regret however that despite extensive investigations we are unable to locate any service records relating to Alfred John Trinca."

The Australian Department of Defence has little more to offer as the following extract from a letter, dated 25 June 1987, to the author shows:

"Navy Office records indicate that your father was not a member of the Royal Australian Navy, he was appointed as a civilian surgeon for a specific period. Not many details are held on him. However, with little information we have, a Statement of Service is enclosed. ... In respect of his service he qualified for the following campaign awards: 1914-15 Star, War Medal, Victory Medal."

The failure of responsible Australian and British authorities to keep records of service of Kitchener's hundred doctors is deplorable. These men responded to the 'call' promptly and unselfishly. Many of them were willing to forgo the invaluable experience of hospital residency, others the prospect of a promising medical career. Some made the supreme sacrifice, while others had their lives shortened or their health impaired as a result of war service. This article is the first published account of Kitchener's Hundred, and is an attempt to give due recognition, though belated, of a noteworthy group of Australian doctors.

\*The Sydney MBChM became MBBS in 1927.



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## Book Review

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### The Limits of Safety: Organisations, Accidents and Nuclear Weapons

Reviewed by Fabian Purcell, MB BS FANZCA  
Staff Anaesthetist, Southern Health Care Network

**Scott D Sagan, Princeton Studies in International History and Politics.  
C 1993 Princeton University Press ISBN 0-691-03221-1**

Many may wonder why a book on US military nuclear weapon safety has relevance to a health journal. The book's first chapter sets the scene with a generic discussion of accidents and organisational learning. This discussion is viewed from two opposing theories, High Reliability Organisation theory and Normal Accident theory.

In this day of quality assurance programs, such information has relevance to health care professionals who work in large organisations. Hopefully one would not identify health care as a hazardous technology but aspirations to emulate their focus on reliability are probably worthwhile.

High Reliability Organisation theorists believe that serious accidents can be prevented through the design of organisations and their operation, citing US aircraft carrier operations as proof. Normal Accident theory claims accidents in high-risk industries, although rare, are an inevitable and normal

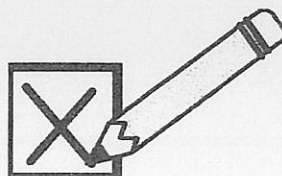
part of hazardous technology management. As one reads these two opposing views, the parallels with our health care system become obvious.

Rather than a simple 'bash' of all things nuclear or a cynical recounting of nuclear near mishaps, Sagan then 'competitively tests' these two theories against the US response to the Cuban missile crisis, the subsequent NORAD early warning organisation and the Thule B52 bomber accident. Later events such as the 1973 DEFCON 3 alert are used as benchmarks of learning (or the lack of it) from earlier nuclear weapon handling errors. By carefully choosing some of the more bizarre or notable events of American nuclear weapon history the book succeeds in making a fairly dry topic quite interesting. This was a worthwhile book to read.

So ... if you have to know how a grizzly bear nearly caused an American nuclear strike on Cuba please read on.



# **2000 Conference**



**Mark your diary NOW!**

**AUSTRALIAN MILITARY MEDICINE  
ASSOCIATION**

**9<sup>th</sup> Annual Scientific Conference**

**20-22 October 2000  
Hotel Grand Chancellor  
Hobart Tasmania**

Enquiries to the Conference Managers  
Joyce McGregor & Paula Leishman  
on (03) 6247 1850

# AMMA Update

News and information for members of the Australian Military Medicine Association

## Successes

The following AMMA members have achieved success through honours, awards, promotions, publications, etc.

Members will note that these items are not complete. The Editor needs sources of information from the three Services and from our civilian members as well, so that this section of your journal can truly reflect the cross-section of our membership. Updates can be faxed to CMDR Andy Robertson on (02) 6266-3933 or e-mailed to: [agrobart@excite.com](mailto:agrobart@excite.com)

## Queens Birthday Honours

The following members of AMMA were honoured on the occasion of the Queens Birthday:

- AVM Graeme Moller (Retd) - AM
- CMDR Andy Robertson - CSC
- MAJ Paul Taylor - CSC

## Other Awards and Achievements

The following members of AMMA have received awards as shown:

- LEUT Fabian Purcell RANR, Lonsdale Medal, Dux Staff Acquaint Course, 1999

## Defence Force Promotions

The following AMMA members have been selected for promotion in the Defence Forces:

- LTCOL Neil Burton to COL
- CMDR Mike Loxton to CAPT
- CMDR Tim Maddern to CAPT
- MAJ Darren Keating to LTCOL
- MAJ Carmel Van Der Rijt to LTCOL

- LCDR Mark Parrish to CMDR
- LCDR Robyn Walker to CMDR
- LEUT John Lodder to LCDR
- LEUT Phil Spehr to LCDR
- LEUT Jeanette McCrow to LCDR
- LEUT Tony Hayward to LCDR
- WO Mark Leddy to LEUT

## Defence Force Movements

- CMDR Mike Loxton will be posting to Fleet Medical Officer at the end of 1999.
- CMDR Mark Parrish will be taking over at Balmoral Naval Hospital in May 2000.
- LCDR Robyn Walker will be relieving as Deputy Fleet Medical Officer in May 2000.
- LTCOL Steve Rudski posts to the AMEDD position in San Antonio in December.
- WGCDR Amanda Dines will be moving from the Defence Health Service Branch to fill the billet of CO of CAMU.
- GPCAPT Graham Peel has posted to Bougainville with the Peace Keeping Force.
- WGCDR Tracy Smart will also be posting to the US to fill the exchange billet with the USAF.
- CAPT Russ Schedlich RAN has resigned from the Permanent Forces, effective at the end of 1999.

## AMMA Conferences

### 1999 Conference

The 8th AMMA Scientific Conference will be held in Adelaide from the 8th to the 10th of October 1999 at the Stamford Plaza Hotel.

### Conference Committee:

- Tracy Smart
- Janet Scott
- Suresh Babu

## AMMA Website

AMMA has a new website:

<http://amma.trump.net/>

Whilst still under construction, there is lots to see. Let us know how we can improve the page and please provide us with links you have found useful.

## AMMA Contacts

For all general AMMA enquiries contact the Secretariat:

Leishman & Associates on

Tel: (03) 6247-1850

(0412) 875-390

Fax: (03) 6247-1855

## Research Grants

Details of the AMMA Research Grant programme are included in this journal.

Members are reminded that applications for the 2000 Research Grant must be received by 30 June 2000. Further details on the Grant can be obtained from:

Janet Scott:

Tel: (08) 8272-7399

## Journal

Journals for 1999-2000 will be published as follows:

Issue	Copy Deadline
December 1999	10 December
March 2000	31 January
August 2000	31 June

All queries regarding the Journal should be directed to:

Andy Robertson

Tel: (02) 6265 5084



## Library

The Association's Library is located in the Fleet Medical Officer's office, Maritime Headquarters Sydney.

Any member who wishes to browse through the Library (and visit the Librarian for coffee) is welcome to call. Books from the library are available for loan of up to 12 weeks.

Contact:  
Russ Schedlich  
Tel: (02) 9563-4504  
(0412) 286-740  
Fax: (02) 9563-4554

## Conference and Meeting Calendar

Date	Conference	Venue	Contact No.
08-10 Oct 1999	8th AMMA Conference	Adelaide, SA	03-6247-1850
22 Nov - 03 Dec 1999	RAN Underwater Medicine Course	Sydney, NSW	02-9960-0333
20-22 Oct 2000	9th AMMA Conference	Hobart, TAS	03 6247 1850

## AMMA ON THE NET

AMMA Website <http://amma.trump.net.au/>

Some useful pages:

Medical Conferences:	<a href="http://www.pslgroup.com/medconf.htm">http://www.pslgroup.com/medconf.htm</a>
NBC Medicine:	<a href="http://www.nbc-med.org/">http://www.nbc-med.org/</a>
New Scientist:	<a href="http://www.newscientist.com/">http://www.newscientist.com/</a>
Travel Medicine:	<a href="http://www.cdc.gov/travel/travel.htm">http://www.cdc.gov/travel/travel.htm</a>
Medical Journal of Australia	<a href="http://www.mja.com.au/">http://www.mja.com.au/</a>
RACGP	<a href="http://www.racgp.org.au/">http://www.racgp.org.au/</a>
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For more information please contact the Secretariat on  
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# **AUSTRALIAN MILITARY MEDICINE ASSOCIATION MEMBERSHIP DRIVE**

AMMA are looking for new members.  
Before Christmas you will be receiving a brochure outlining the benefits of belonging to AMMA, including information on grants and prizes that are available.

To assist the association we are seeking members cooperation in identifying potential new members.

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Leishman & Associates,  
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(03) 62471850, or send us an email  
at: [paulaleishman@trump.net.au](mailto:paulaleishman@trump.net.au)



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***Deadline is 10 December 1999***

### **Instructions for Authors:**

Articles submitted for publication in *AMM* should conform to the following guidelines:

- an electronic copy, either on an IBM formatted 3.5 inch floppy disc or by email in a standard word processing programme or up to and including Word 7, should be submitted
- one hard copy should be submitted, typed double-spaced on A4 paper (single-side)
- the text in both hard and electronic copies should be unformatted
- references in the text should be numbered consecutively as they are cited and annotation of the references should accord with the style given in *Index Medicus*. Where there are seven or more authors, list only the first three then *et al*. For example:  
Szilagyi M, Dawson RM. Phosgene - A research review. *Aust Mil Med* 1995; 4(2):16-19
- figures and tables should be submitted separately with an indication in the text as to where they should be located
- the originals of all photographs, ECGs, EEGs etc should be submitted to allow high quality reproduction

Articles submitted may be subject to peer review. Articles which have been published elsewhere will only be considered if they are of importance to the field of military medicine, and publication will only proceed with the prior approval of the original publisher.



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