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Australian Military Medicine Association

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Statement of Objectives

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

○ promoting the study of military medicine

○ bringing together those with an interest in military medicine

○ disseminating knowledge of military medicine

○ publishing and distributing a journal in military medicine

○ promoting research in military medicine

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

The Association is totally independent of the Australian Defence Force.
Editorial

December...

December is always an interesting time to consider what progress has been made in the year past. We have seen, once again, the Australian Defence Force heavily committed in our regional area, in East Timor and Bougainville; at home, with over 5,000 troops involved in ensuring Australia had a safe and unforgettable Olympic Games; and in planning for the future, with the release of the Defence White Paper. In all these areas, Defence health personnel have played important roles. 2001 is shaping up to be another year of challenge and change, with the ADF likely to have continued involvement in regional areas of concern, including East Timor. As we strive to cope with the increasing demands, above all we need to continue to retain our professionalism (and probably a sense of humour!).

As many of you may already know, I have recently taken over the job of Director of the Joint Health Support Agency. While still very early days, I can already appreciate the hard work that everybody is involved in throughout Australia. That includes not only the permanent and reserve health members, who have crucial roles both operationally and in support, but also the contract health practitioners who fill the gap while our personnel are away on operational service and, without whom, many of our bases would not run. As part of my role as Director of JHSA, I’m looking forward to catching up with everybody in the New Year.

The year 2000 has also been an interesting year for military medicines and for the journal. As promised, we have increased the size and, I believe, range of articles in the journal and I hope to build on this progress in 2001. To achieve this aim, and as I would like the journal to be 80 pages per issue, Australian Military Medicine has a continuing need for a range of interesting articles and scientific papers from our readers and others interested in military medicine.

I would like to actively bring to your attention two of the AMMA prizes and awards provided by the Association. The first, the Journal Editor’s Prize, is awarded by the Editor of Australian Military Medicine for the best paper published in the journal and is worth $750. The 2000 prize went to Neil Westphalen for his two-part article on Australia’s involvement in the Boxer Rebellion. The second is the essay prize, which for 2000 was unawarded. The topic for next year’s Essay Prize is “The future role of IT in military health”. I look forward to your contributions.

Whilst on contributions, I have a small challenge for the historians and literati out there. As one who has a keen interest in the historical use of biological weapons, I have been intrigued recently by their historical use in literature, particularly as a criminal act. Two stories come to mind, the first, an Arthur Conan Doyle story, in which the villain attempts to kill Sherlock Holmes using melioidosis. A later story, written by Sapper, details the attempted use of yellow fever infected mosquitoes to kill a Russian count. I would be very interested in identifying the earliest stories in this genre and appreciate any help.

This particular issue of the Journal addresses some key psychological concerns that face us all as members of Defence Health Service Branch. The issue includes excellent papers on suicide in the ADF and post traumatic stress disorder. We also have to some thought provoking papers on operational fitness; one on the training required to get Australian Defence Force Academy cadets fit for their future military duties, the other on the impact of asthma on military service. From a military medical historical viewpoint, Major General Pearn looks at the first Australian military anaesthetist. In our viewpoint section, we have some diverse papers on ageing and terrorism, lessons learnt and on the ethos of Saint Luke in military medical practice.

As we go into 2001, we farewell our Patron of the last three years, Major General John Pearn, who has been a stalwart in his support of AMMA, its Journal and its aims, and we welcome Air Vice-Marshall Bruce Short as our new Patron. We look forward to working with him over the next few years. Best Wishes for 2001.

Andy Robertson

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1 Doyle AC. The adventure of the dying detective. 1913.
2 Sapper. Thirteen lead soldiers. 1937.
President’s Message

Russ Schedlich

As we move into the new century and new millennium, and celebrate the Centenary of Federation, it is timely also to recall that AMMA is entering its 10th anniversary year.

From humble beginnings, AMMA has developed into a robust organisation of over 350 members, with a triennially published journal that continues to develop in quality, and an annual conference that is widely considered to be the best Australian forum for the robust and intellectually stimulating consideration of military medicine issues (as well as a good all-round bash). For this progress we have to thank two key players - James Ross, whose idea the Association was and who put in the hard yards to establish it; and Nader Abou-Seif who was Vice President alongside James and who replaced him when James got the call overseas. With the steady support of their Councillors, the secretariat, and of course the membership, James and Nader have set the Association on a strong footing for further development.

At the 2000 Annual General Meeting, in Hobart last October, Nader stood down and I have been given the privilege of leading the Association. I have a hard act to follow. Nader was President of the Association for a total of five years, and for the last six conferences. He dedicated his spare time to advancing AMMA in any way possible. I know that, thanks to Mr Costello, he has had less spare time available, and I also know that he felt the time was right to pass the baton to someone else. His efforts in leadership were well demonstrated by the success of the conference - the best attendance since 1994, and the largest number of papers submitted ever - and also by the significant increase in membership over the years - notably up by nearly 60 in the last 12 months. The Association’s financial health has also been placed on a sound footing, and this with no requirement to lift fees at this time. I am grateful that Nader has agreed to stay on Council as Vice President, and I will, I am sure, be relying on his wisdom and counsel.

As to the future, in conjunction with Council, I will be aiming to set goals for membership, financial position, the journal, links with similar professional bodies, conferences and other research and education support activities - some might recognise the dreaded “Business Plan” model in there. We will ensure membership is provided regular feedback on our plans and also seek your ideas.

As a first step in improving regular communication, we have established an eGroup for members of the Association. You can find this at www.egroups.com/group/AustMilMedAssn (sorry, AMMA was taken) and I would encourage you to join. Using this method (posting messages to AustMilMedAssn@egroups.com), anyone in the Association can pass ideas and information on to all the members, and Council will be using this as a means to get information out to the membership quickly. Given the Association has members from across the spectrum of health professions, this eGroup will supplement ADFDocs and others that have already been established.

The Hobart conference was, without a doubt, the Association’s best. We attracted a large number of quality papers, having, for the first time, to go to concurrent sessions. About 120 delegates attended, and we made a modest surplus on the event. With the support of our sponsors, we were able to put on this weekend, at a top location, for a very modest price compared to many other professional conferences. The professional networking was, as always, the most valuable component of the weekend. Further information on the Conference is included in the Journal.

Our 10th anniversary conference will be held on the Gold Coast at the Gold Coast International Hotel from 19 to 21 October. I urge you to clear this weekend in your diary, and start thinking about a paper to present.

The Defence Health Services continue to have very large demands placed on them. They continue to be committed to East Timor and Bougainville, and have more recently had to respond with higher levels of care to other trouble spots. On a personal note, it has been pleasing to see the Navy’s Primary Casualty Reception Facility in HMAS Manoora activated in support of a recent operational commitment. While doing all this, Defence Health has had to continue to manage health care for those back home, and this in itself is a challenging task in the present environment. In all these activities, the
support of the Reserves in an integrated role with the Permanent Forces has been pivotal to success, as it will be into the future. It is this Association's task to stimulate intellectual thought and discussion in ways that advance the provision of operational health support to make it easier and more effective, so that our deployed colleagues are better able to support our combat troops.

Finally, your President has gone bush, accepting a position as Area Director Medical Services Far West Area Health Service, based in Broken Hill. For those of you who know my aversion to remoteness from the sea, this will no doubt come as a surprise, until you consider that the issues and challenges in this Area are almost exactly the same as for Navy (and the other Services as well) - remoteness, scarcity of health resources, significant health threats, etc. So I will be pulling the levers by remote control, but in this age of telecommunications that will not be difficult. Can I invite anyone who might be passing through the Hill to please let me know - there are many pubs and a really great golf course - and it would be good to see you.

In closing, I hope you have all had a great festive season, a well-earned break, and return safely to the challenges of 2001.

Russ Schedlich

Coming Next Issue

- Smallpox: To Live or Die
- Melioidosis: A Review
- The Medical Management Of Chronic PTSD in the Military
- The ADF Anti-Filariasis program
- Persian Gulf War Health Study
- Defence, Captive Studies and Consent
- Medicine in World War I - A Personal Perspective
For the first year, the Association’s new awards and grants system was implemented. The following awards and grants were announced at the 2000 Conference.

**Weary Dunlop Award**
The Weary Dunlop Award, named after our first life member, is awarded to the best original paper presented at the Annual Conference and is worth $500. The Conference Organising Committee this year decided that a panel of past winners should do the judging of this award, and Council has agreed that this should become the practice for the future. In Hobart, there were not enough past winners to do the judging unassisted, and the Panel consisted of Annette Owtrtrim, Peter Sullivan, John Turner and Amanda Dines.

The Panel judged Rob Lewin and Richard Mallett’s paper - *A comparison of 20 metre shuttle run test (20mSRT) scores and time loss due to injury for the first six months of training at ADFA from 1999-2000* - as the conference’s best, and worthy winners of the Weary Dunlop Award.

**Patron’s Prize**
The Patron’s Prize is awarded by the Association’s Patron to the best paper published in a peer-reviewed journal during the year and is worth $250. Our Patron, Major-General John Pearn awarded the prize to Dave Newman for his original research published in *Aviation, Space and Environmental Medicine* on “patterns of physical conditioning in Royal Australian Air Force F/A-18 pilots and the implications for +Gz tolerance”.

**Journal Editor's Prize**
The Journal Editor’s Prize is awarded by the Editor of Australian Military Medicine for the best paper published in the journal and is worth $750. Our Editor, Andy Robertson awarded the prize to Neil Westphalen for his two-part article on Australia’s involvement in the Boxer Rebellion.

**Essay Prize**
Last year’s topic for the Essay Prize was “Post Deployment Syndromes”. However, no entries were submitted.

The topic for next year’s Essay Prize is “The future role of IT in military health”. Contributions are required to be submitted to the Secretariat by 30 June 2001.

**Research Grants**
The AMMA Research Grant is provided to assist in research being undertaken by members of the association in aspects of military health, and is worth up to $1,000, which may be granted in full, in part, or divided between several applicants. There were two applications for the Grant, both of which Council considered were worthy of support. As the Essay Prize has not been awarded this year, Council has determined that this year’s Essay Prize be combined with the Research Grant and the whole divided equally between the two applicants.

I am therefore pleased to announce that Mike O’Connor will receive $750 towards his research into pregnancy outcomes in ADF personnel and John Newlands will receive $750 to continue his research into the effect of the menstrual cycle on vision.
Weary Dunlop Award 2000

A comparison of 20mSRT scores and time loss due to injury for the first six months of training at Australian Defence Force Academy from 1999 to 2000

R Lewin, R Mallet

This study investigated the relationship between initial 20 metre shuttle run test (20mSRT) and time loss due to injury. We found an association between low 20mSRT scores, as conducted on arrival at ADFA, and subsequent risk of time loss due to injury, though the sample size studied was small. Fitness, as measured by 20mSRT, may be an important and modifiable risk factor for time loss due to injury. Persons below a certain fitness standard, as measured by 20mSRT, may be at excessive risk of injury during basic military training.

Introduction
The Australian Defence Force Academy (ADFA) is a military training institution for Australian Navy midshipmen, Army and Air Force officer cadets. It provides university education to future military officers, combined with basic military training. This education and training period usually lasts for three years, and is followed by further service specific training. Entry to ADFA is based on suitability for a future career as an officer, as well as the ability to achieve academic goals. There are currently no physical fitness criteria for exclusion from entry to ADFA, though all potential cadets are medically screened for illness prior to selection. For the last few years, on arrival at ADFA, data on basic tests of fitness of cadets has been collected. These tests have included the 20mSRT.

A significant number of cadets fail to complete their training at ADFA. This may be due to academic failure, injury, or failure of an assessment as to their suitability as an officer. In particular, until recently, cadets were required to be able to pass an Academy Fitness Test, based on current service fitness requirements, prior to graduation from ADFA. Some cadets fail to pass this fitness test at any time during the three years of their training at ADFA. Such cadets are often unable to go on to service specific training and may not return useful service after their education. Injury was found to be a significant cause of lost training time, and was an important factor contributing to failure to pass fitness standards required for graduation.

Pope et al. conducted an investigation into the association between 20mSRT score and risk of injury and failure to recover from injury at Australian Army Recruit Training Centre (ARTC) at Kapooka. 1317 male Australian Army recruits undergoing 12 weeks of intensive training were assessed using a 20mSRT. A strong negative association between 20mSRT score and risk of attrition, and a positive association between sustaining a lower limb injury and risk of attrition was found. Recruits who scored 6 or less (low fitness) on the 20mSRT were five times more likely to sustain injury than recruits who scored 11 or more (high fitness). Fit subjects with an injury were 25 times more likely to recover from their injury and complete training successfully than less fit subjects with an injury. The results of this study led to modification of training, and adoption of minimum fitness standards for enlistment based on 20mSRT score. Estimated cost savings of 38.5 million were achieved over a four year period.

From January to June this year, 44 female first year cadets at ADFA were noted to have required extensive time of restricted duties due to injury. In five months of training, these 44 individuals accumulated

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2 Dr Rob Lewin has a Masters of Sports Medicine and is currently working at CAMU in a sports and rehabilitation role.
1234 days of restricted duties due to injury or illness. ADFA requested an investigation to assess this group and to explain why this group had sustained such a high incidence of time loss. ADFA also asked for recommendations as to what could be done to assist these individuals to recover, and to prevent injuries in training at ADFA in the future.

Methods
The ADFA occupational health and safety officer reviewed the ADFA medical advice cards (similar to a PM 101, which is a letter military doctors use to describe medical restrictions) of the 36 individuals in question. The rehabilitation Physical Training Instructor (PTI) also kept data on cadets requiring restrictions from part or all of their physical training, and recorded the cause of restrictions. Where required, the medical notes were obtained for clarification of time lost due to injury vs time lost due to illness, or a combination of both.

ADFA employs PTIs specifically to train and monitor the fitness of cadets. In recent years, data was collected on fitness test results, including 20mSRT. The PTIs also monitor cadets who have restriction of duty due to injury or illness. Cadets with injury or illness who are unable to complete required training must be medically assessed, and obtain a "chit", or restriction of duties, written on an ADFA medical advice card. Cadets who have restriction of duty due to injury or illness are then not required to complete normal physical training. These cadets on restrictions are given closely supervised physical training programs designed to assist their recovery and maintain fitness. Injured cadets are allocated to a rehabilitation group for supervised training during periods of time allocated for sport or physical training.

This year, the physical fitness of cadets was evaluated using a progressive 20mSRT, as described by the Australian Sports Commission. Cadets were required to run back and forth between two lines spaced 20 metres apart. The initial speed is 8.5 km/hr increasing by 0.5 km/hr at approximately 1 minute intervals, which are labelled stage 1, stage 2 etc. Speed of running is controlled by loud “beeps” from a standardised tape. The 20mSRT score is the time when the subject is unable to keep up with the required speed of running by falling to reach within two strides of the lines on the ground at the time determined by the beeps. This year, cadets were graded as a pass standard if they achieved a 20mSRT score of 7.5, and the cadets were not required to perform beyond this level for their initial assessment. In 1999, the 20mSRT was performed as a maximal test, cadets were encouraged to continue beyond the level of 7.5 to their best effort.

Results
Results 1. ADFA female cadets 20mSRT scores on initial assessment for years 1999 and 2000, showing percentage of cadets in each year who achieved a 20mSRT score of 7.5 or higher.

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of female students</td>
<td>76</td>
<td>44</td>
</tr>
<tr>
<td>Medical limitations /not tested</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>20mSRT score less than 7.5</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>20mSRT score of 7.5 or higher</td>
<td>63</td>
<td>11</td>
</tr>
<tr>
<td>Percentage of cadets achieving 7.5</td>
<td>83%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Results 2. ADFA male cadets 20mSRT scores on initial assessment for years 1999 and 2000, showing percentage of cadets in each year who achieved a 20mSRT score of 7.5 or higher.

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of male students</td>
<td>215</td>
<td>129</td>
</tr>
<tr>
<td>Medical limitations /not tested</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>20mSRT score less than 7.5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>20mSRT score of 7.5 or higher</td>
<td>203</td>
<td>119</td>
</tr>
<tr>
<td>Percentage of cadets achieving 7.5</td>
<td>95%</td>
<td>91%</td>
</tr>
</tbody>
</table>

Results 3. ADFA female cadets training days lost to injury or illness during the first 156 days of training, as documented on ADFA medical advice cards for years 1999 and 2000, showing the number of cadets requiring limitations, the total number of days of limitations and the average limitations per cadet.
Results 4. ADFA male cadets training days lost to injury or illness during the first 156 days of training, as documented on ADFA medical advice cards for years 1999 and 2000, showing the number of cadets requiring limitations, the total number of days of limitations and the average limitations per cadet.

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of male students</td>
<td>154</td>
<td>129</td>
</tr>
<tr>
<td>Medical limitations</td>
<td>64</td>
<td>56</td>
</tr>
<tr>
<td>Number of medical advice cards issued</td>
<td>88</td>
<td>113</td>
</tr>
<tr>
<td>Total number of days of restricted duty</td>
<td>635</td>
<td>1204</td>
</tr>
<tr>
<td>Average days lost to injury or illness per cadet</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

Discussion

This study showed an important difference in the fitness levels of cadets as measured by the 20mSRT. In particular, the year 2000 female cadets were less fit than the year 1999 female cadets, and as a group, the female cadets were less fit than the male cadets.

This study confirmed that a small group of cadets at ADFA had a disproportionately high number of training days lost due to injury or illness when compared to their peers. In particular, this study showed that a small group of female cadets had a much higher number of training days lost to injury or illness than male cadets who were in the same training program during training in both 1999 and 2000. This study showed a relationship between low fitness as measured by the 20mSRT and time loss due to injury.

This study showed an increase in the average days lost to injury or illness per cadet between 1999 and 2000. The number of days lost to injury or illness doubled from the year 1999 to 2000.

Comparison of fitness data and time lost due to injury or illness for ADFA for the first year cadets of 1999 and 2000 showed important differences for both males and females. This was a retrospective study. It was difficult to determine the effect of differences in training requirements and differences in physical training instructors on the time lost due to injury or illness. In the year 1999, the 20mSRT was conducted as a maximal test but in the year 2000, cadets were told they could stop once they achieved a score of 7.5. This may have affected the value of results when comparing one year to another. The role of the medical staff, doctors, nurses, physiotherapists and medical assistants in providing medical restrictions was not controlled. Different medical staff may have used different factors in deciding to provide medical restrictions to cadets. There are no documented protocols to assist medical staff in determining the appropriate provision of medical limitations to cadets. These results may indicate a trend, but further formal studies will be required to accurately determine the association between fitness as measured by a 20mSRT and time loss due to injury or illness at ADFA.

The role of gender and risk of injury

This study showed a disproportionately high incidence of time loss injuries in female cadets. During military training, where men and women are exposed to the same training load, women have been shown to experience approximately twice the number of injuries as men. This is of significant concern at ADFA, which is a mixed gender training facility. Should the training and fitness standards for female cadets be reduced or modified in some way to reduce the injury risk to females?

A study of 509 men and 352 women U.S. army trainees during an 8 week basic combat training course confirmed the increased risk of injury for women, but also showed that when the injury rates were adjusted for fitness as measured on a 2 mile run, there was no significant gender difference in injury rates. The authors concluded that run time, as a marker for weight bearing fitness, is particularly relevant to predicting lower limb injuries, which are the most common injuries seen. They also found that women entered training less physically fit relative to their own fitness potential as well as relative to men entering training.

Relative importance of risk factors

To show the importance of selected risk factors, Jones et al. conducted a study on 391 army trainees, results published in 1993. They showed a higher relative risk of musculoskeletal injuries for women (Table 1), increased risk of time loss injury in men
with low and high range body mass index (BMI) measurement (Table 2) and increased risk of time loss injury and stress fracture in slow versus fast runners (Table 3). Interestingly, out of 124 men in this study, no time loss injuries occurred in the men who were in the fastest half of the group on the initial one mile test, while men in the slower half of this study group had a 29% risk of a time loss injury. Similarly, no stress fractures occurred in the faster men, while the slower men had a 4.8% risk of stress fracture. While the relative risk cannot be determined from the sample size of this study, the trend of less injuries in men who were faster is important.

<table>
<thead>
<tr>
<th>Type of injury</th>
<th>Women (n=186)</th>
<th>Men (n=124)</th>
<th>Relative Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>50.5%</td>
<td>27.4%</td>
<td>1.8</td>
</tr>
<tr>
<td>Lower limb</td>
<td>44.6%</td>
<td>20.9%</td>
<td>2.1</td>
</tr>
<tr>
<td>Time loss</td>
<td>30.1%</td>
<td>20.2%</td>
<td>1.5</td>
</tr>
<tr>
<td>Stress fracture</td>
<td>12.3%</td>
<td>2.4%</td>
<td>5.1</td>
</tr>
</tbody>
</table>

Table 1. Relative risks of musculoskeletal injury for women compared with men during 8 weeks of combat training.

<table>
<thead>
<tr>
<th>BMI quartile</th>
<th>Number</th>
<th>Injury Incidence (%)</th>
<th>Relative Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 low</td>
<td>31</td>
<td>25.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Q2</td>
<td>32</td>
<td>9.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Q3</td>
<td>29</td>
<td>13.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Q4</td>
<td>31</td>
<td>32.3</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Table 2. Men: incidence of time loss injuries and relative risks by quartile of measures of BMI. 123 subjects, with mean BMI of 24.3.

<table>
<thead>
<tr>
<th>Injury</th>
<th>Any</th>
<th>Lower Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Slow group incidence (%)</td>
<td>34.2</td>
<td>58.9</td>
</tr>
<tr>
<td>Fast group incidence (%)</td>
<td>12.2</td>
<td>34.7</td>
</tr>
<tr>
<td>Relative risk</td>
<td>2.80</td>
<td>1.69</td>
</tr>
</tbody>
</table>

Table 3. Men and women: incidence of time loss injury for slow versus fast runners with relative risks.

<table>
<thead>
<tr>
<th>Injury</th>
<th>Time Loss</th>
<th>Stress Fracture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Slow group incidence (%)</td>
<td>29.0</td>
<td>38.2</td>
</tr>
<tr>
<td>Fast group incidence (%)</td>
<td>0.0</td>
<td>19.5</td>
</tr>
<tr>
<td>Relative risk</td>
<td>2.12</td>
<td>2.54</td>
</tr>
</tbody>
</table>

Table 3. Men and women: Incidence of time loss injury for slow versus fast runners with relative risks.

Modification of risk factors for injury

Injury risk in military training and service may be reduced by investigating for, and identifying, risk factors. Risk factors can be intrinsic or extrinsic. Intrinsic risk factors such as age, gender, race and anatomical variants that lead to an unacceptable risk of injury could be controlled by screening, and exclusion of affected individuals from certain occupations or tasks. Intrinsic factors such as cardiorespiratory fitness, strength and flexibility could be considered as modifiable. Exclusion of selected individuals from high risk activities would reduce the injury rate, however, it may be reasonable to use screening tests to identify at risk individuals and then provide specific training to change their physical fitness. Improving the physical fitness, in particular the fitness as determined by a run or shuttle test should then allow that person to perform their military duties with no significant increased risk of injury.

Modification of extrinsic risk factors, such as unsafe work practices, faulty equipment and training errors is equally important in reducing the injury risk for military personnel. Modification of the workplace can lead to important reductions of injury rates.

Past injury not only increases the chance of an individual being at increased risk of any injury due to the factors already discussed, but also functions as an independent variable to increase the risk of re-injury. To rehabilitate injured workers and successfully return them to the workplace, a consideration of the future risk of injury should be made, and modifiable risk factors corrected.
Measuring physical fitness

Cardiovascular fitness tests.

- **Definition of VO2 max** Maximal oxygen uptake (VO2 max) is gross oxygen consumption in ml./kg/min. VO2 max is accepted as the criterion measure of cardiovascular fitness. It is the product of the maximal cardiac output (L/min) and the arterial-venous oxygen difference (mls oxygen/L) (10). It gives an indication of oxygen extraction from air by the respiratory system, delivery of oxygen to the tissues by the cardiovascular system, and of tissue oxygen extraction and utilisation at the cellular level.

- **Direct measurement of VO2 max**. Direct measurement of VO2 max is performed in physiology laboratories, and in this procedure, the subject breathes through a low-resistance valve with a nose occluded while pulmonary ventilation and expired fractions of oxygen and carbon dioxide are measured.10

- **Indirect tests for estimating VO2 max, sub-maximal and maximal tests**. When direct measurement of VO2 max is not feasible, a variety of sub-maximal and maximal indirect tests can be used to estimate VO2 max without complex laboratory support. Sub-maximal testing, while reasonably accurate, is not as precise as maximal testing. The basic aim of sub-maximal testing is to determine the heart rate response to a defined sub-maximal work rate to predict VO2 max. Maximal tests determine the workload at the point of volitional fatigue or maximum effort over a defined workload defined by time taken, distance travelled or level of output achieved. These indirect tests have been validated on large numbers of subjects by comparing the test results to directly measured values of VO2 max. Examples of indirect tests for VO2 max include treadmill tests, cycle ergometer tests, 20mSRT, step tests and field tests. Field tests consist of walking or running a certain distance in a given time. The advantages of field tests are that large numbers of individuals can be tested at one time and little equipment is needed.10

- **Sub-maximal field testing for estimation of VO2 max**. The Rockport one-Mile Fitness Walking Test and other walking tests are popular sub-maximal field tests for estimating VO2 max. The heart rate is measured in the final minute of the Rockport one-Mile Fitness Walking Test after the subject walks one mile as fast as possible. Taking the heart rate after the completion of the walk tends to overestimate the VO2 max as the heart rate decreases with rest. VO2 max is calculated from an equation including factors for age, gender, body mass and time to walk one mile. When an individual is given repeated submaximal exercise tests over a period of weeks or months and the heart rate response to a fixed work rate decreases over time, it is likely that the individual's cardiorespiratory fitness has improved.10

- **Maximal field testing for estimation of VO2 max**. Two of the most widely used running tests for assessing cardiorespiratory fitness are the Cooper 12-minute test and the 1.5-mile Run Test for time. The objective in the 12-minute test is to cover the greatest distance in the allotted time period, and for the 1.5-mile test it is to run the distance in the shortest period of time. These are both considered maximal tests for estimation of VO2 max. An equation for estimation of the VO2 max for the 1.5 mile Run Test is VO2 max = 3.5 + 483 / (time in minutes).10

<table>
<thead>
<tr>
<th>Time (min) for 2.4 km</th>
<th>20mSRT score</th>
<th>VO2max mls/kg/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>19:00</td>
<td>4.2</td>
<td>27.0</td>
</tr>
<tr>
<td>18:30</td>
<td>5.2</td>
<td>29.0</td>
</tr>
<tr>
<td>16:30</td>
<td>5.6</td>
<td>31.5</td>
</tr>
<tr>
<td>15:00</td>
<td>6.6</td>
<td>35.0</td>
</tr>
<tr>
<td>13:30</td>
<td>7.2</td>
<td>37.0</td>
</tr>
<tr>
<td>13:00</td>
<td>7.8</td>
<td>39.0</td>
</tr>
<tr>
<td>12:30</td>
<td>8.4</td>
<td>41.0</td>
</tr>
<tr>
<td>12:00</td>
<td>8.8</td>
<td>42.5</td>
</tr>
<tr>
<td>11:00</td>
<td>9.6</td>
<td>45.0</td>
</tr>
<tr>
<td>10:45</td>
<td>9.11</td>
<td>46.5</td>
</tr>
<tr>
<td>10:30</td>
<td>10.4</td>
<td>48.0</td>
</tr>
<tr>
<td>10:00</td>
<td>10.8</td>
<td>49.5</td>
</tr>
<tr>
<td>9:45</td>
<td>11.4</td>
<td>51.5</td>
</tr>
<tr>
<td>9:30</td>
<td>11.10</td>
<td>53.0</td>
</tr>
<tr>
<td>9:15</td>
<td>12.4</td>
<td>55.0</td>
</tr>
<tr>
<td>9:00</td>
<td>12.10</td>
<td>56.5</td>
</tr>
<tr>
<td>8:30</td>
<td>13.4</td>
<td>58.0</td>
</tr>
<tr>
<td>8:15</td>
<td>13.10</td>
<td>60.0</td>
</tr>
<tr>
<td>7:45</td>
<td>14.10</td>
<td>63.5</td>
</tr>
<tr>
<td>7:15</td>
<td>15.8</td>
<td>66.0</td>
</tr>
<tr>
<td>6:45</td>
<td>16.2</td>
<td>68.0</td>
</tr>
<tr>
<td>6:30</td>
<td>17.12</td>
<td>71.5</td>
</tr>
<tr>
<td>6:10</td>
<td>18.12</td>
<td>77.5</td>
</tr>
</tbody>
</table>

Table 4. Time taken to complete the 2.4 km run test, VO2 max level and the corresponding 20mSRT score.3,11
Muscular strength tests.

Muscular strength refers to the maximal force that can be generated by a specific muscle or muscle group. It can be measured as a static or a dynamic measurement. The standard of dynamic strength testing is the 1-repetition maximum, the heaviest weight that can be lifted only once using good form.¹⁰

Muscular endurance tests.

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Men, push-ups</th>
<th>Women, push-ups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>&gt;85</td>
<td>&gt;36</td>
</tr>
<tr>
<td>Above</td>
<td>65-85</td>
<td>29-35</td>
</tr>
<tr>
<td>Average</td>
<td>45-65</td>
<td>17-21</td>
</tr>
<tr>
<td>Below</td>
<td>&lt;25</td>
<td>&lt;9</td>
</tr>
<tr>
<td>Poor</td>
<td>&lt;25</td>
<td>&lt;16</td>
</tr>
</tbody>
</table>

Table 6. Population figures for push-ups for men and women aged 20-29, based on Canada Fitness Survey, 1981.¹²

Muscular endurance is the ability of a muscle group to execute repeated contractions over a period of time sufficient to cause muscular fatigue, or to maintain a specific percentage of the maximal voluntary contraction for a prolonged period of time. Simple field tests such as the sit-up test or the maximum number of push-ups that can be performed without rest may be used to evaluate the endurance of the abdominal muscle groups and upper body muscles, respectively.¹⁰

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Men, sit-ups</th>
<th>Women, sit-ups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>&gt;85</td>
<td>&gt;36</td>
</tr>
<tr>
<td>Above</td>
<td>65-85</td>
<td>37-42</td>
</tr>
<tr>
<td>Average</td>
<td>45-65</td>
<td>33-36</td>
</tr>
<tr>
<td>Below</td>
<td>25-45</td>
<td>29-32</td>
</tr>
<tr>
<td>Poor</td>
<td>&lt;25</td>
<td>&lt;28</td>
</tr>
</tbody>
</table>

Table 7. Population figures for sit-ups for men and women aged 20-29, based on Canada Fitness Survey, 1981.¹²

Improving physical fitness

The study results in Table 8 show that while there was an overall improvement in fitness of both male and female trainees, the improvement was more pronounced for the women. In this study, the men exhibited significantly higher entry-level measure of physical fitness, and though the women did not outperform the men by the end of 8 weeks training, the difference was considerably less. Mean end of study 2 mile run times were 14.0 mins for men, and 17.4 mins for women.⁵

<table>
<thead>
<tr>
<th>Factor</th>
<th>Gender</th>
<th>Improvement (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit-ups</td>
<td>Female</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>44</td>
</tr>
<tr>
<td>Pushups</td>
<td>Female</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>54</td>
</tr>
<tr>
<td>Aerobic fitness, from VO2 max</td>
<td>Female</td>
<td>23</td>
</tr>
<tr>
<td>Calculated from run time</td>
<td>Male</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 8. Improvement in fitness parameters after an 8 week training period for female and male army basic trainees.⁵

The injury risk of training for fitness

- Duration (min/day) | No. of participants | Injury incidence % | Change in VO2 max %
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (0)</td>
<td>18</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>22</td>
<td>+8.7</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>24</td>
<td>+16.1</td>
</tr>
<tr>
<td>45</td>
<td>24</td>
<td>54</td>
<td>+16.7</td>
</tr>
</tbody>
</table>

- Frequency of training 3 days per week
- Intensity of training 85 to 90% of maximum heart rate

| Frequency (days/wk) | No. of participants | Injury incidence % | Change in VO2 max %
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (0)</td>
<td>13</td>
<td>0</td>
<td>-3.0</td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>0</td>
<td>+8.0</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>12</td>
<td>+12.9</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>39</td>
<td>+17.4</td>
</tr>
</tbody>
</table>

Table 9. Effects of duration of running training in a group of prison inmates on cumulative incidence of injury and aerobic fitness (VO2 max) with training frequency and intensity held constant for 20 weeks.¹³

- Duration of training 30 minutes per day
- Intensity of training 85 to 90% of maximum heart rate

Table 9 and 10 show that exercise duration and frequency are both important...
factors in a program designed to maximise improvements to VO2 max while minimising injury. The subjects studied in tables 5 and 6 were male prisoners aged 20 to 35 years. Initial VO2 max levels were between 41.5 to 45.8 ml/kg/min. Both groups showed a disproportionate increase in injury risk compared to gains in fitness with over training.

Will the modification change the risk

Current research has identified injury as an important problem for the military. There is some similarity in the injury rates and types of injuries sustained by Australian and United States military personnel. Interestingly, the U.S. Army Physical Fitness Test consisting of tests of cardiorespiratory endurance (2 mile [3.2 km] run times), muscle endurance (push-ups and sit-ups) and surrogate measurements for body composition (height and weight) is similar to components of fitness testing performed on Australian personnel.

Current research has also identified risk factors for injury, some of these risk factors appear to be modifiable. Further study is required to show if changing a risk factor would lead to a corresponding reduction in risk of injury.

Generally, research on injury prevention is difficult in the Australian military. Airforce, Army and Navy function independently in relation to fitness testing and medical fitness standards. Statistics are either not kept or not analysed promptly to provide current information. It seems reasonable to use data from US researchers who are better funded and have large populations to analyse. If we accept a role of fitness testing as part of injury prevention, it would be reasonable to standardise our testing, and to use a test that would generate data that has already been shown to correlate with injury risk in another military population.

Conclusion

ADFA is currently re-evaluating the fitness standards to be applied on entry and during the three years of training. At ARTC Kapoorka, persons with a 23mSRT score of less than 7.5 are excluded from entry for training. A 23mSRT score of 7.5 is equivalent to a VO2 max of 38 ml/kg/min or a 2.4km run time of approximately 13:15 (9.11). This has resulted in significant reductions in injury rates, attrition and cost. There is little doubt that similar standards, if applied at ADFA, would have similar benefits. The training requirements at these two Australian training institutions are quite different. Kapoorka has a limited time to achieve a high standard of training towards a career as a soldier in infantry. ADFA has a much longer time to train cadets in the role of officers in many different specialised areas. If the standards of Kapoorka were applied at ADFA, many of the current cadets would be excluded on the basis of the 20mSRT score on entry. This standard would not take into account the differing time restraints and intentions of training at ADFA and Kapoorka.

All ADFA graduates are required to meet fitness test standards specific to their service on employment as officers. The minimum expectation on graduation should therefore be the ability to pass the fitness standards that will be required on employment.

<table>
<thead>
<tr>
<th>Service</th>
<th>Gender</th>
<th>Push ups</th>
<th>Flexed arm hang</th>
<th>Sit ups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army (1)</td>
<td>Male</td>
<td>50</td>
<td>(5)</td>
<td>75 (6)</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td></td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>Air Force (2)</td>
<td>Male</td>
<td>(4)</td>
<td>30</td>
<td>30 (7)</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Navy (3)</td>
<td>Male</td>
<td>25</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>25</td>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service</th>
<th>Gender</th>
<th>2.4 km run time</th>
<th>5km walk time</th>
<th>500m swim time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army (1)</td>
<td>Male</td>
<td>10.48</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>Female</td>
<td>12.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Force (2)</td>
<td>Male</td>
<td>12.00</td>
<td>40.00</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>13.00</td>
<td>41.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Navy (3)</td>
<td>Male</td>
<td>13.00</td>
<td>42.00</td>
<td>12.30</td>
</tr>
<tr>
<td>Female</td>
<td>15.00</td>
<td>43.00</td>
<td>13.30</td>
<td></td>
</tr>
</tbody>
</table>

Table 11. A comparison of service fitness test requirements for the Australian Defence Force.

Notes:
1. Standards for Army personnel under 21 years old.
2. Standards for Air Force personnel under 35 years old.
3. Standards for Navy personnel under 35 years old. Navy personnel can choose one of push ups or flexed arm hang, and one of run, walk or swim.
4. No push up test for Air Force.
5. No flexed arm hangs for Army.
6. Sit ups with feet held for Army.
7. Sit ups with feet not held for Air Force and Navy.
8. No 5 km walk for Army personnel under 41 years old.
9. No 500 m swim test for Army or Air Force.
Table 8 "Improvement in fitness parameters after an 8 week training period for female and male army basic trainees" shows the improvement that could be expected with training. It may be reasonable to accept cadets at a lower standard on entry so long as the percentage improvement required within each parameter is achievable within a reasonable time. ADFA has both the time and resources to train cadets to meet these standards.

<table>
<thead>
<tr>
<th>Service</th>
<th>Gender</th>
<th>Push ups</th>
<th>Flexed arm hang</th>
<th>Sit ups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army (1)</td>
<td>Male</td>
<td>33 (5)</td>
<td>52 (6)</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Air Force (2)</td>
<td>Male</td>
<td>4</td>
<td>21 (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Navy (3)</td>
<td>Male</td>
<td>16</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>4</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

Table 12. Recommended minimum entry standards for ADFA based on current service fitness test requirements and adjusted for expected improvement with eight weeks training. Adjustment of 2.4 km run time, correlating predicted improvement in VO2 max to predicted improvement in run time. 5,11,14

Number on entry = number required x 100 /
(100 + percentage improvement)
Percentage improvement after an 8 week training period. from Table 8.

Number on entry = number required x 100 /
(100 + percentage improvement)
Percentage improvement after an 8 week training period. from Table 8.

Notes:
10. No data available to adjust flexed arm hang, 5 km walk or 500 m swim for improvement with training.

These are the minimum fitness standards on entry that could be expected to improve to the required standards with training.

Persons below these minimum levels should be considered at unacceptable risk of injury during training and unlikely to achieve acceptable standards. Accepting persons at or near these minimum standards would also result in a high rate of injury and attrition during training.

**Recommendations:**

1. ADFA conduct screening tests of physical fitness prior to commencement of training.
2. Exclusion of persons unable to attain the reduced fitness standards prior to entry, as outlined in Table 8, as unsuitable for training, on the basis of risk of injury, risk of attrition and risk of not being physically capable of attaining the standards of service specific fitness tests.
3. Identification of persons of low standards of physical fitness and provision of special training for these individuals to improve their physical fitness in the shortest possible time with the least risk of injury.
4. Identification of high risk activities through review of past medical data, with modification of such activities, or delay in exposure of cadets to such activities until a reasonable and safe fitness standard is demonstrated.
5. Retesting at 8 weeks and 20 weeks after commencement of training, and then at six monthly intervals to validate the effectiveness of interventions and expected reduction of injuries, while continuing to identify individuals in need of training assistance.
6. Comprehensive rehabilitation for injured cadets to be conducted in normal work hours with the aim of efficient return to full fitness or early identification of persons unsuitable for continuation of training.

**Acknowledgments**

Capt. Richard Mallet, OC CAMU-D; Louise Steinman, Rehabilitation Physiotherapist & Case Manager, CAMU-D; Dr Shaun Bond, Medical Officer, CAMU-D; and the PTI staff at ADFA.

**References**

Asthma in the military. An evaluation of asthma morbidity and the standard of care at an Australian Defence Force establishment

G Quail

The 6 RAAF Hospital Morbidity Study (1993-94) was designed to document the morbidity of a population of service personnel by analysing the presenting problems of 1,807 consecutive consultations.

The study generated some interest in morbidity in the Australian Defence Force (ADF), and it was decided to ascertain the impact of a common medical problem on service personnel and to evaluate the standard of medical care provided in relation to that condition.

Asthma was selected for the following reasons:

- It is a significant health problem, occurring in 8% of the Australian adult population and results in much time lost from work, hospital admissions and a number of deaths in the Australian community each year.
- Despite careful recruitment screening, it was a common cause for presentation at the Out patients Department at 6 RAAF Hospital.
- A ‘gold standard’ - the Asthma Management Plan (AMP) has been established so it is possible to ascertain the standard of care provided at a Defence Force establishment in comparison to that recommended by the AMP.

Asthma in the Military

An exacerbation of asthma may occur at a time of physical or psychological stress-conditions common in a military environment, and as such, has long been a reason for rejection for military service.

The U.S. Navy directs that any candidate with asthma after their 12th birthday should be rejected. The British Army will not accept any applicant who required treatment for asthma or wheezy bronchitis in the previous four years. Candidates with a history of wheezing at an earlier age are assessed by a respiratory physician and if a bronchial challenge test is positive, they are rejected.

The Australian Defence Force, in their Recruit Medical Procedures document, requires that any applicant with a history of asthma in the last three years be rejected. Those wishing to train as aircrew, divers or submariners must be symptom free and off medication for three years. In addition, an assessment from a respiratory physician is mandatory. For spray painters and aircraft life support fitters, a history of asthma disqualifies, irrespective of the symptom free period. Pain stated that in doubtful cases, in the interest of all concerned, the bias should be for rejection.

Aims of Study

The aims of the study were to:

1. Determine the degree of morbidity experienced by ADF members with asthma, what factors precipitate an attack, the degree of incapacity experienced and the effect of asthma on their deployability.

---

2 Professor Geoff Quail is Clinical Associate Professor in the Department of Surgery at Monash University.
2. Evaluate the quality of patient education, by inquiring about the patients’ understanding of asthma, its pathophysiology and medications they have been prescribed.

3. Ascertain the degree of asthma control achieved as revealed by current respiratory function tests, patients’ assessment of their condition, emergency visits, sick leave granted and hospital admissions relating to asthma.

4. Review documentation in the medical history relating to asthma.

**Method**

Approval was first obtained from the Australian Defence Medical Ethics Committee.

A letter was then written to all general practitioners working at 6 RAAF Hospital asking them to invite their asthma patients to join the study. It was stressed that this exercise was to be undertaken to ascertain the severity of asthma in the ADF and evaluate management with a view to optimising quality of care. The letter was accompanied by a Plain Language Statement for distribution to patients. In addition, doctors were urged to emphasise that all matters discussed with the assessor would remain confidential and that no entry would be made on the medical documents. In all but one case patients accepted the invitation.

Participating patients presented to the author and all agreed to sign a consent form. They were then asked to complete a 25 part questionnaire, the questions being based on the Asthma Management Handbook. The assessor was on hand to clarify any question.

At the interview, respiratory function tests, both before and after broncho dilatation with salbutamol, were performed in accordance with recommendations of Pierce and Johns.

The medical documents were examined. As there was no time restraints on ADF doctors, it is to be expected that notes should be full and comprehensive.

The following information was extracted for the preceding 12 month period:

- number of visits concerning asthma;
- record of peak flow or respiratory function tests;
- documentation of a personalized asthma management plan;
- work absences or hospitalization for asthma; and
- specialist assessment for asthma at some previous time and whether a provocative challenge had been performed.

It is conceded that members may have felt that if they were truthful regarding their asthma their careers could be jeopardised. The Plain Language Statement explained that all information provided is confidential and that no entry would be made on the medical documents. These points were reinforced at interview.

The results were collated and analysed. Confidence Intervals for proportions were calculated using the Exact Method. Where indicated, percentage response and p values were also derived.

In order to quantify the results, acceptable answers to the six questions in which scoring was possible were constructed using the AMP handbook and standard respiratory medicine texts. Marks were awarded according to the degree of accuracy of the answers provided.

Questions so quantified were:

- what do you understand by the term asthma?
- what do you think happens in an asthma attack?
- what is the value of the peak flow meter?
- how do you manage an attack?
- what are the actions of drugs used in asthma?
- when do you take your drugs?

**Results of Survey Questionnaire**

There were ten females and thirty six males in the study, which is consistent with the patient population of 75% males on the Base. The ages ranged from 18-55 years. The results were collated and analysed.

Unlike community practice, co-morbidity was low. Only 15 patients required non asthma medications and of these, eight took treatment for the related condition of hay fever.

**Demographic Aspects**

**Family History**

Thirty nine percent reported a family history of first degree relatives with asthma. In three cases, the members were adopted and were unaware of their parents’ health.

There is no support to the premise that a positive family history leads to early diagnosis (p=1.00).

It was thought that a positive family history may result in a better understanding of the disease; however, the results were similar in both groups (p=1.00).
Age of Onset

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Percentage of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>13 (5-26)</td>
</tr>
<tr>
<td>11-20</td>
<td>17 (7-31)</td>
</tr>
<tr>
<td>21-30</td>
<td>37 (23-52)</td>
</tr>
<tr>
<td>31-40</td>
<td>24 (13-39)</td>
</tr>
<tr>
<td>41 -</td>
<td>7 (1-18)</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1: Age of onset of asthma symptoms.1

Interval (years) | Percentage of Patients |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1</td>
<td>63 (48-73)</td>
</tr>
<tr>
<td>1-2</td>
<td>4 (1-15)</td>
</tr>
<tr>
<td>2-5</td>
<td>9 (2-21)</td>
</tr>
<tr>
<td>6-10</td>
<td>13 (5-26)</td>
</tr>
<tr>
<td>11-14</td>
<td>2 (0-12)</td>
</tr>
<tr>
<td>15-20</td>
<td>2 (0-12)</td>
</tr>
<tr>
<td>Greater than 20</td>
<td>7 (1-18)</td>
</tr>
</tbody>
</table>

Table 2: Time to diagnosis from onset of symptoms
The mean age of onset of asthma in this group was 24.8 years (median = 27). 61% were first noted to have asthma between the ages of 21 and 40 years (Table 1). 63% were diagnosed within one year of onset of symptoms (Table 2).

Atopy

Twenty seven patients reported a history of hay fever, various allergies or eczema, with hay fever (allergic rhinitis) being the most common problem (Table 3). Some patients had more than one complaint.

<table>
<thead>
<tr>
<th>Complaint</th>
<th>No.</th>
<th>Percentage of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay fever</td>
<td>26</td>
<td>57 (81-100)</td>
</tr>
<tr>
<td>Allergy</td>
<td>9</td>
<td>20 (17-54)</td>
</tr>
<tr>
<td>Eczema</td>
<td>4</td>
<td>9 (4-34)</td>
</tr>
</tbody>
</table>

Table 3: Associated atopic complaints

Associated Morbidity

- Non asthma medications - apart from seven patients frequently prescribed anti histamines, only eight others were taking regular medication, three of whom were using lipid lowering drugs.
- Nasal symptoms - forty six percent complained of persisting nasal symptoms of which the majority identified hay fever as their major concern.

Precipitating Factors

The major trigger factors precipitating an asthma attack were exercise and weather change (Table 4).

<table>
<thead>
<tr>
<th>Precipitating Factor</th>
<th>Percentage of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise</td>
<td>61 (45-75)</td>
</tr>
<tr>
<td>Weather change</td>
<td>57 (41-71)</td>
</tr>
<tr>
<td>Exposure to irritants</td>
<td>35 (21-50)</td>
</tr>
<tr>
<td>Pollens</td>
<td>28 (16-43)</td>
</tr>
<tr>
<td>Respiratory infections</td>
<td>26 (14-41)</td>
</tr>
<tr>
<td>Dust mites</td>
<td>17 (8-31)</td>
</tr>
<tr>
<td>Exposure to chemicals</td>
<td>15 (6-29)</td>
</tr>
<tr>
<td>Emotion</td>
<td>13 (5-26)</td>
</tr>
<tr>
<td>Food additives</td>
<td>11 (3-24)</td>
</tr>
<tr>
<td>Gastric reflux</td>
<td>9 (2-21)</td>
</tr>
<tr>
<td>Animals</td>
<td>7 (1-18)</td>
</tr>
<tr>
<td>Foods</td>
<td>7 (1-18)</td>
</tr>
<tr>
<td>Drugs</td>
<td>2 (0-12)</td>
</tr>
</tbody>
</table>

Table 4: Precipitating factors

Significance Of Smoking

Only seven patients (15%, CI 6-29) were currently smoking. All but one smoker described two or more symptoms. Five stated that symptoms occurred only occasionally, one experienced symptoms each day and one on most days.

Presenting Symptoms

Eleven patients (24%, CI 13-39), experienced only one symptom of asthma, 26 (56%), complained of two, and only nine (20%), reported more than two symptoms. The two principal symptoms were shortness of breath and wheeze (Table 5).

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short of breath</td>
<td>63 (48-77)</td>
</tr>
<tr>
<td>Wheeze</td>
<td>63 (48-77)</td>
</tr>
<tr>
<td>Chest tightness</td>
<td>41 (27-57)</td>
</tr>
<tr>
<td>Cough</td>
<td>28 (16-43)</td>
</tr>
</tbody>
</table>

Table 5: Presenting symptoms

Severity of Asthma

Thirty seven patients (80%) thought their asthma was mild, and only two considered it severe (Table 6).

Severity Change

Twenty six patients (56%), considered their asthma unchanged in the past two years. 22% thought it had worsened and the same number that it had improved.

1 Unless otherwise stated, N=46. Figures in parenthesis are 95% confidence intervals
<table>
<thead>
<tr>
<th>Severity</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>80 (66-91)</td>
</tr>
<tr>
<td>Mild-moderate</td>
<td>7 (1-18)</td>
</tr>
<tr>
<td>Moderate</td>
<td>9 (2-21)</td>
</tr>
<tr>
<td>Severe</td>
<td>4 (1-15)</td>
</tr>
</tbody>
</table>

Table 6: Patient’s assessment of the overall severity of their asthma

Limiting Activity
It is interesting that only 27 patients (59%), stated that asthma reduced their exercise tolerance.

Work Absence in the Last 12 Months
Only four members lost any time from work due to asthma. This comprised 4, 7, 8, 15 days. The overall average sick leave taken by the group was 0.81 days per year. The cohort compared favourably with the Base average of 1.67 days lost through sickness.

Frequency of Symptoms

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Occasionally</td>
<td>83 (69-92)</td>
</tr>
<tr>
<td>Most days</td>
<td>13 (5-26)</td>
</tr>
<tr>
<td>Every day</td>
<td>4 (1-15)</td>
</tr>
</tbody>
</table>

Table 7: Frequency of symptoms

Emergency Room Visits
Only five patients (11%), had attended an emergency facility for treatment of their asthma in the last 12 months. All but one had mild asthma with infrequent symptoms

Duration of Attack Post Beta Agonist.
Self-administration of beta agonist in an attack provided symptomatic improvement within 30 minutes in 24 patients (52%). A further 13% did not receive relief until one hour of the first symptoms; whilst in the remaining 34% symptoms lasted for one hour. However, in only eight patients did symptoms persist more than two hours (Table 8).

<table>
<thead>
<tr>
<th>Duration</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-15 m</td>
<td>39 (25-55)</td>
</tr>
<tr>
<td>15-30 m</td>
<td>13 (25-26)</td>
</tr>
<tr>
<td>30-60 m</td>
<td>13 (25-26)</td>
</tr>
<tr>
<td>1-2 hr</td>
<td>11 (4-24)</td>
</tr>
<tr>
<td>2-24 hr</td>
<td>9 (2-21)</td>
</tr>
<tr>
<td>&gt;24 hr</td>
<td>9 (2-21)</td>
</tr>
<tr>
<td>Till nebulised salbutamol</td>
<td>2 (0-12)</td>
</tr>
<tr>
<td>No attack 4 yrs.</td>
<td>2 (0-12)</td>
</tr>
<tr>
<td>No B-agonist, attack 30m.</td>
<td>2 (0-12)</td>
</tr>
</tbody>
</table>

Table 8: Duration of attack post B-agonist

Management of Asthma
Prevention

Influenza Vaccine
Nine patients (19%), received influenza vaccine in the 12 months prior to the survey. This included all patients in the moderate and severe categories.

Drugs used routinely in the prevention of asthma
Consistent with the mild nature of asthma in the ADF, it was found that 10 patients (22%) did not consider it necessary to use prophylactic medication. Inhaled cortico steroids (ICS), were used on a regular basis by 25 patients (54%), whilst nine used salbutamol either alone or in combination with ICS.

Drugs used prior to a known provocative stimulus (such as exercise)
Fifteen patients used salbutamol for this purpose and one an antihistamine.

Relief
Drugs used to relieve an attack
All patients reported their medications were effective in arresting an acute attack. In four cases, drugs were unnecessary in 1997.

All patients used inhaled short acting beta agonists and in two cases this was supplemented by ICS. Fifty two percent said their symptoms were relieved in 30 minutes of using a beta agonist. One member inhaled cromoglycate whilst one severe asthmatic required daily prednisolone.

In patients where management was sub optimal; that is, did not conform with the AMP Guidelines, 29% responded to treatment within 30 minutes of the outset of an attack.
Other measures used in an acute attack and their effectiveness.

As is the case in many chronic diseases, alternative therapies are popular with asthmatics but their effectiveness is difficult to evaluate due to the placebo effect. Twelve patients employed non prescribed measures. Anxiety plays a major role in an asthmatic attack and four patients found rest beneficial, whilst another four attempted to control their breathing. Three reported that steam was helpful. This is to be expected as dry air irritates the bronchial mucosa and in some cases precipitates an attack. It is interesting that one member found relief by applying oil prescribed by a naturopath to his chest. Another member said his asthma improved after learning to play the trumpet. In the 12 patients who employed self initiated measures all declared that they were effective.

Appropriateness of Medication

In accordance with current recommendations, no patient was prescribed theophylline preparations. In only one case had prednisolone been given. All other cases were managed with ICS and beta agonists either alone or in combination apart from one patient who used cromoglicate and another, a combination of beta agonist and an antihistamine.

With respect to comorbidity, no patients were prescribed drugs that enhanced bronchial constriction or hyperreactivity such as beta blockers, aspirin or NSAIDS.

Monitoring Lung Function

The AMP states that in patients with a forced expiratory volume in one second (FEV1), of less than 80% of the predicted value and in those where the initial measurement increases by 15% after bronchodilatation, intensive medication is indicated to reduce airways inflammation and reverse obstruction.

Using these criteria at the time of assessment, it was noted that five patients had sub optimal FEV1s and in three cases FEV1 increased by more than 15% after salbutamol. In the remaining 83%, spirometry was acceptable.

Audit of Medical Documents

Attendance

This revealed that all patients were seen in 1997 but two did not attend regarding their asthma. Respiratory function tests (RFTs) or peak flow meter (PFM) readings were recorded for 35 patients. The number of visits related to asthma ranged from 0 (2), to greater than 3 (7) with a mean of 2.0 Attendance was mainly for resupply of drugs.

Record of an asthma management plan

In this respect, the audit showed some short comings in management. Only 74% had been given a personalized plan and no patient had a written plan. The doctor who treated the greatest number of asthmatic patients stated that the majority had mild disease and therefore a written plan was not necessary.

Referral to a consultant physician or allergist

A specialist opinion was obtained in 32 cases (79%), 26 of which were from a respiratory physician. Methacholine challenge was used in 18 of these patients to ascertain if bronchial hyper-reactivity was present.

Respiratory function tests

During the previous 12 months. RFTs or PFM readings were recorded for only 35 of 44 patients (80% of those who attended for management of their asthma).

Asthma Management Plan

In no case was an asthma management plan recorded in the history.

Assessment of Patient’s Management of their Attack

Using the AMP Guidelines, management was assessed as appropriate in 28 patients (61% CI 45-75), barely adequate in 17 (37%), and inadequate in one. Of the 18 not using drugs correctly, more than half (10), had a good understanding of their drugs’ actions. There was no significant difference in duration of an attack between those who managed their asthma appropriately and the group where it was barely adequate (p=0.748).

Effectiveness of Patient Education

Patient review

Attendances ranged from 0-10 in the 12 month period. The mean was 2.0 and the median 2.4 visits for asthma management. The two patients that did not attend for their asthma stated that they were untroubled during the period under study. The two who considered their asthma to be severe attended five and seven times in the 12 month period. All cases seen seven or more times (four cases), had been assessed by a respiratory physician.
Knowledge of asthma

Eighty-two percent of patients displayed an acceptable understanding of asthma and its pathophysiology.

Understanding value of peak flow measurements

It was disturbing to find that only 55% (CI 31-78), who possessed a Peak Flow meter (PFM), fully understood the value of a PF measurement and four had no idea at all. There was however, no statistical difference between the group with a meter (n=18), and the total cohort (p=0.139).

Has inhaler technique been explained?

All members stated that the use of the inhaler had been explained by their pharmacist and in some cases checked by the doctor.

Understanding use of medications

- Preventives - of the 35 who used preventive medications, only 34% (CI 15-42) fully understood how their drugs worked and 45% had no understanding at all.
- Relievers - 59% had a good understanding but 11% had no idea of the action of beta agonists.

Do the same patients score badly on all assessments?

Information was extracted on the 10 patients who when questioned about their understanding of asthma clearly failed. Their scores in knowledge of the actions of preventive and reliever drugs, the value of the PFM, and their management of an attack were examined. Six of the ten failed two or more questions and two of these six failed three questions.

Discussion

Family History

The role of family history in the etiology of an individual’s asthma remains unclear. It has long been known that asthma and atopy run in families. Most studies have found a family history in between 40-60% of cases. The findings in this study are comparable.

There was no relationship between knowledge of asthma and a positive family history, similarly a family history of asthma did not lead to an early diagnosis.

Age of Onset

It was observed that the majority of patients (61%), were not diagnosed with asthma until over 21 years. This in contrast to most other studies which report that half the cases develop before the age of 10 years. The late onset recorded here may be due to several factors. It may indeed be late onset asthma, be due to late diagnosis, or the applicant presenting to recruiting in the ‘window period’ (10-16 years) when asthma is often dormant. In addition, it is probable that many with early onset asthma either do not apply to join the defence forces or are rejected at recruiting. As it is common knowledge that a history of asthma may lead to rejection, it is probable that a number of applicants fail to disclose this aspect of their history. All this leads to a sampling bias and therefore no conclusion can be reached in this respect.

Atopy

Atopy is considered by some authorities to be the only established risk factor for asthma, and is certainly one of the most important. Most asthma is associated with atopy but in susceptible individuals, exposure levels that induce atopy and asthma are different. The findings in this study are consistent with those of Juniper, who also comments that hay fever has a greater impact on quality of life than mild to moderate asthma.

Avoiding allergens has long been recognised as an important preventive measure. Stimuli identified by subjects in this study include cats, tobacco smoke and house dust. One patient described moderately severe asthma when based at Butterworth, Malaysia, where humidity is high and the house contained mouldy carpet. His asthma was dramatically reduced when he returned to Melbourne to a home with polished floors and opening windows. It is however possible that other factors were responsible for the improvement in his asthma such as psychological considerations, work environment and diet.

A recent Australian children’s survey found 80% of asthmatics had symptoms due to atopic disease. The low prevalence in our study (59%), may reflect the selection process, whereby many of the more severe cases were rejected.

Associated Morbidity

Fifteen subjects received regular medication of whom eight were taking antihistamines. Periodic medical examinations (PME) are a requirement of the ADF and as these include a fasting blood examination for lipids, it might be expected that hyperlipidaemia is identified more commonly than in the general population. Three patients were receiving therapy for
this problem. In another five cases there was unrelated comorbidity requiring drugs.

Precipitating Factors
As seen in most studies, exercise and weather change were the principal factors leading to an asthma attack.

Significance of Smoking
In this study, smoking was associated with more symptoms than experienced by the non-smoker group, but otherwise smoking was not associated with greater morbidity.

It is reported that 25% of 15 year old Australians smoke every day. The low number of smokers observed in this study (15%), may reflect a smaller number of smokers in the ADF compared with the community. One factor that could serve as a deterrent to smoking is the ADF policy that members who fail to pass their annual fitness test face discharge from the services.

Presenting Symptoms
Symptomatically asthma is often described as a triad of wheeze, dyspnea and cough, the first being the sine qua non. In typical asthma all three are present. In this study 83% of subjects complained of two or more symptoms with shortness of breath and wheeze occurring most commonly, whilst recurring cough was reported in only 28%. Similar results are noted in some other studies.

A persistent cough was reported by 13% patients. In the past this was often attributed to respiratory infection. It is probable that cold air is responsible for coughing in most asthmatics but gastro-esophageal reflux appeared to be a factor in two of the cases studied.

Severity of Asthma
An impression of the severity of asthma in the ADF can be gained by considering a number of factors. These include:

- Severity change. Patients were asked whether they had noticed any change in the severity of their asthma in the previous two years. As this is a relatively short time in the natural history of the disease, no change was expected. One factor that does influence severity and severity is the uniqueness of the military environment whereby troops are often transferred between regions each year. We have found that many asthmatics have few or no symptoms at (say) Darwin but are troubled at Wagga or Laverton. Undoubtedly, such a change in symptomatology is multi-factorial and may involve climate, vegetation, housing, work stresses or other factors.

- Limitation of activity. Exercise stimulates bronchial secretions and bronchospasm in many asthmatics. It is interesting that only 5% stated that symptoms limited their exercise tolerance. This contrasts with Ander's findings, that exercise induced asthma occurs in 70-80% of asthmatics. The low figure in the ADF study group may be due to the relatively high use of corticosteroids coupled with the low severity of the disease.

- Patient's assessment of overall severity. In this study, 80% of patients regarded their asthma as mild and only 4% as severe. This is in contrast with Abdulwirdi's community study, in which he reported that 32% considered their asthma was severe.

- Attendance related to asthma. Overall, patients attended for management of their asthma 2.0 times in the previous 12 months. This was mainly for resupply of their medications and supports the premise of mild disease in this cohort.

- Work absence. The finding that only four members lost time in the previous 12 months is lower than that reported in many other studies. It may be due to members of the ADF requiring a medical certificate before taking sick leave, the vigilance of the medical officers in caring for their patients, the relatively mild disease seen in ADF personnel or a combination of these factors.

- Frequency of symptoms. The observation that 38 patients reported that symptoms occurred infrequently reflects the mild nature of the disease in the ADF. This contrasts with other community studies where it is reported that many patients complained of symptoms on most days.

- Waking short of breath or requiring Emergency Room (ER) visits. The small number of patient who wake short of breath more than once a week (4%), and the few patients requiring ER visits (11%), illustrate the mild nature of the disease and the good control obtained.

- Referral to Consultant Physician or Allergist. This is thought to be higher in the community studies and is a result of the exacting employment standards in the ADF which preclude patients with asthma from certain occupations or limit their deployability.

- Respiratory function. As previously
noted, respiratory function was acceptable in 85% of cases when tested by the assessor. Whilst this result is not optimal, it is consistent with the patients own assessment in which 80% consider their asthma to be mild.

In summary, asthma was found to be a mild disease in the ADF. A statement supported by the above findings that include quantifying lung function through the use of supervised respiratory function tests.

**The Effectiveness of Patient Education**

**Knowledge of Asthma**

Eight two percent of patients were found to have a satisfactory understanding. Some of the remainder had mild disease and may not have received comprehensive instructions. Others might not have regarded their condition to be sufficiently serious to merit learning about asthma.

**Understanding Peak Flow Measurements**

One may ask why only 39% were prescribed a PFM? Discussion with doctors taking part in the survey revealed that they did not consider a PFM necessary in mild disease. In one Australian study, 19 19% had a PFM; whilst in another, only 5% had a meter. Perhaps the higher number in the ADF reflects the availability of meters free of charge.

**Inhaler technique**

The results (100% affirmative response), reflect credit on the pharmacist. At best, the inhaler is an inefficient device for delivering a metered dose. If inadequate instruction is given resulting in poor technique, the inhaler can be a grossly inadequate delivery device.

**Understanding medications**

It was observed that only 34% fully understood how their preventive medication worked and 45% had no idea at all.

With respect to reliever drugs, the results are again disappointing. 41% had an inadequate understanding. This included 11% who had no understanding at all.

Whilst it should be borne in mind that the concept of action of an anti-inflammatory drug is not as easy to understand as that of a bronchodilator, these figures give rise to some concern. They suggest that in this respect doctor and pharmacist education techniques could be improved.

**Management of an attack**

Although it must be conceded that the investigator’s assessment of each patient’s management is somewhat subjective, the low figure of 65% of patients reporting relief in 60 minutes suggests that more care could be given to explaining an appropriate management strategy.

Of patients whose management was deemed sub-optimal, 57% responded in 30 minutes. This suggests that as generally accepted, beta agonists are very effective in terminating an attack even if the drug is not delivered as directed.

In summary, patient education presents a mixed picture. Whilst the disease and its process were well explained and the correct use of the inhaler understood by all members, the mode of action of drugs, particularly preventives, was inadequate. This aspect of education needs to be addressed. In addition, more care needs to be given to explaining how to respond to the onset of asthma symptoms.

**Audit of Medical Documents**

The amount of detail recorded in the medical documents was extremely variable.

The few visits regarding asthma reflect the mild nature of the disease in the ADF together with the degree of control achieved. There was a paucity of detail concerning management including drugs prescribed. No patient had a plan recorded and in the 12 months under review respiratory function was noted in only 80% of histories.

**Referral to a respiratory physician**

This is thought to be higher than in most community studies and is the result of the exacting employment standards in the ADF which preclude patients with asthma from certain occupations or limits their deployability.

**Conclusion**

In conclusion, the study found that asthma in the ADF is a mild disease. This may be due to careful screening at recruitment and effective management of the disease by service doctors.

Treatment methods at 6 RAAF Hospital were in accordance with the recommendations of the Thoracic Society of Australia and New Zealand’s Asthma Management Plan 1996.

**Acknowledgments**

The author wishes to thank the Australian Defence Medical Ethics Committee for approving this study, Dr MCF Pain for his
advice and Dr A Neath for reading the script.

References

Suicide In The ADF (1985-2000)\(^1\)

K Gisler, N Sadler\(^2\)

Introduction
The 2000 ADF Health Status Report identified that over the five years from 1994 to 1998 suicides were the third leading cause of death (behind natural causes and motor vehicle accidents) and accounted for 17% of deaths for permanent ADF members.\(^1\) Mental illness, a major risk factor of suicide, is a leading cause of working days lost from hospitalisation of ADF personnel and constitute a significant component of ADF medical invalidity retirement, reports to DEFCARE and claims accepted by Department of Veterans’ Affairs. Suicide, suicide related behaviours and mental illness appear to be significant problems affecting the efficiency of the ADF.

Aim
This paper examines ADF data on suicide, suicide related behaviours and mental illness for the period 1985 to 2000. Recommendations towards the development of prevention strategies and interventions are also briefly discussed.

Background
Risk factors for suicide include a vast array of mental health, family, relationship, societal and situational factors. However, as the majority of suicides and suicide related behaviours occur within the context of mental illness, these issues cannot be discussed in isolation. The relationship between suicide, attempts and gestures, self harming behaviour and mental illness should be considered as separate conditions that overlap, not an all inclusive continuum (Figure 1).

Mental Illness
Australia
A survey of the Australian community in 1997 estimated that 18% of Australian adults in the community suffer from a mental disorder.\(^2\) More than 50% of people with mental disorders are affected long term; however, only 40% seek help or have their problem diagnosed. Silburn et al reported that the prevalence of mental disorders was around 27% for persons aged 18-24 years, 22% for 25-34 year olds, 20% for 35-44 year olds and 18% for 45-54 year olds.\(^3\)

Mental problems and disorders are responsible for a large number of hospitalisations within the community, account for much disability, incur high health costs and impose a heavy burden of suffering including stigmatisation.

In 1996, in the Australian community, mental disorders were responsible for 13.3% of the total disease burden and for about 30% of the non fatal burden.\(^4\) Depression was the leading cause of non fatal disease burden and mental disorders accounted for 10.2% of the total number of patient days in public hospitals.\(^4\) The Australian rate for admission to hospital for mental illness was 10.6 per 1000 persons per year.\(^4\)

Australian Defence Force
In the absence of complete mental health information, the ADF has to be considered

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\(^2\) Silburn, Karen Gisler is the SO2 Prevention in the Defence Health Service Branch. MAJ Nicole Sadler is an Army psychologist working for the Director General Defence Health Service as the Specialist Adviser - Psychology.
as a subset of the wider Australian community. Determining the relative differences between the ADF and the wider community is difficult and the relative proportions of mental health and mental illness remain unknown due to confounding factors.

In 1996, the admission rates of Service personnel for mental illness were 18.0 per 1000 personnel per year for RAN, 6.6 per 1000 personnel per year for ARA and 7.2 per 1000 personnel per year for RAAF. Overall, the ADF admission rate for mental illness was 10.3 per 1000 personnel per year. The ADF is more likely to admit personnel to hospital for minor mental illness and 'transient situational disturbances'. This is in keeping with its young isolated population, the inherent lack of personal support available within this population, and the lower threshold requirements for hospital admissions.

Antidepressant and anti-psychotic drug usage in the ADF in 1998 was 421 person years. Assuming an average usage of three to six months per person treated, the number of personnel treated in 1998 was 20.3 per 1000 personnel and for 1999 was 23.4 per 1000 personnel (485 person years). It cannot be determined the extent to which hospital admissions for mental illness overlap with drug usage, although it is expected that a substantial proportion of personnel with mental illness are treated as outpatients.

Substance abuse is a significant mental health risk factor for ADF members. In 2000, a tri-Service working party was established to target the incidence of alcohol abuse in the ADF. The ADF also has significant numbers of smokers, a reduction of which is likely to result in significant positive health effects.

General factors that contribute to poor mental health include the breakdown of relationships, separation from loved ones, stress, changes in well being, changes in health status, financial difficulties and the loss of someone close. ADF members are not immune to these issues, and military life also places additional stresses on its personnel that may contribute to the incidence of mental illness, including:

a. sudden and prolonged isolation from home and families;

b. restriction of choice and freedom;

c. imposed discipline;

d. numerous interstate moves;

e. performance anxiety relating to high expectations; and

f. succeed or fail ethos.

**Suicide Attempts / Gestures and Self Harm**

While it is not technically correct to include these behaviours in the same category, the delineation has not been made clear in many reports. Self harm (eg. intentionally cutting self) is distinctly different from suicide attempts and gestures, however, to provide meaningful comparison, these behaviours are discussed together in this paper.

**Australia**

Suicide and self harm accounted for 20,131 hospital admissions during 1997-1998, more than 53,000 patient days in total which is 0.4% of all patient days for public hospitals and 4% of the patient days for mental disorders and diseases in public hospitals. This equates to an overall rate of 10.6 per 10,000 personnel.

**Australian Defence Force**

In general, suicide attempts and gestures are poorly reported to Defence Health Service Branch. This issue is being addressed through changes to the 'Notification of Casualty' requirements for the ADF. In 1998, data on suicide attempts and gestures was collected and is provided here for consideration. For 1998, there were 16 incidents of suicide attempts and gestures and 30 incidents of self harm. This equates to a rate of 8.3 per 10,000 personnel per year, slightly less than the Australian rate.

**Suicide**

Mental disorders are one of the most important risk factors of suicide. Some studies indicate that of those who complete suicide 9 in every 10 have some form of mental disorder at the time of death. Alcohol abuse is present in 25 percent of cases. Major depression, substance abuse, schizophrenia, personality disorders, medical conditions and deliberate self harm all carry higher risks. Other risk factors include a history of previous suicide attempts, a history of sexual or physical abuse, and exposure to the suicidal behaviour of others. These risks do not establish causation, but point to the importance of interacting influences, both socially and medically. It must be remembered that the majority of individuals with a psychiatric disorder do not suicide.

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1 Person year equals the amount of medication needed to administer 1 person this medication for an entire year.
Australia
Approximately one-third of persons who die by suicide were receiving medical treatment immediately before the episode. Suicide and self harm accounted for 20,131 hospital admissions during 1997-1998, more than 53,000 patient days in total. The high risk groups for suicide in the Australian community include:

a. Aged between 25 and 44 (50% of all Australian suicides were in this age group in 1996).
b. Male (80% of successful suicides in 1998 were male).
c. Mental disorders (account for 60-90% of suicides. Individuals with depression, schizophrenia or personality disorders are at most risk).5

Australian Defence Force
The ADF expects lower rates of suicide due to:

a. Enlistment procedures designed to detect personnel with psychiatric disorders, medical problems and drug/alcohol misuse.
b. Higher intelligence levels.
c. Lack of attractiveness of the military to other high-risk groups.6

There have been a total of 142 suicides since 1985: 38 RAN members, 75 ARA members and 33 RAAF members. Figure 3 is the number of suicides in the ADF, split into the three Services by year. There has been a total of seven female suicides since 1985: 1 RAN member, 2 ARA members and 4 RAAF members.

The rate of suicide in the ADF from 1985 to 2000 was 14.3 per 100,000 per year. The average annual rate of suicide for the RAN and ARA was 16.3 per 100,000 and RAAF was 10.9 per 100,000.

Male Suicide Rates. In Figure 2, the suicide rate per 100,000 has been stratified into two age groups for the single Services, the ADF as a whole and the comparative rate for the Australian population. Chi squared testing was performed on this data, controlling for differences in the size of the populations, and the results indicated:

a. For the 15-24 year old group, the Australian population rate and all ADF rates are not significantly different at the 0.05 level.
b. For the 25-44 year old age group, only the overall ADF Male rate is significantly less than the Australian rate (also 0.05). For the single Services, the numbers are too small to result in statistical significance.

It can be seen when analysed in this manner, that suicide in the ADF is indeed a significant problem, particularly in the 15-24 year old age group, where the ADF's rate closely approximates the rate for the Australian community.
Given that the ADF screens its personnel prior to entry it could be interpreted as somewhat disappointing that the suicide rate for the younger age group in the ADF is not significantly less than the rate for the Australian population at large. However, there is a complex array of risk factors that have been associated with suicide, and this area requires further investigation.

Non commissioned ranks are more likely to commit suicide (12.9 per 100 000 per year) than officers (7.4 per 100 000 per year). This difference in rates is not statistically significant.

The methods used for ADF suicides are illustrated in Table 1. A comparison with the Australian population is provided. Hanging, firearms and carbon monoxide poisoning are the most common methods used by ADF personnel to suicide.

<table>
<thead>
<tr>
<th>Method</th>
<th>ADF*</th>
<th>Australian Popn* (15-24 Year Olds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanging</td>
<td>31%</td>
<td>38.5%</td>
</tr>
<tr>
<td>Gunshot</td>
<td>26%</td>
<td>16.8%</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>26%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Drug Overdose</td>
<td>8%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Fall</td>
<td>3%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Table 1. Method of Suicide in the ADF Compared with Australian Population.
(* Percentage of total suicides)

Prevention
There are three levels of prevention:

a. Primary Prevention - targets the Defence community as a whole by increasing awareness and education levels and promoting mental health.

b. Secondary Prevention - targets personnel who are identified as being at risk, to encourage them to seek treatment early to prevent worsening of their condition beyond reasonable recovery levels.

c. Tertiary prevention - targets personnel with known mental illness and/or suicidal tendencies, and encourages an appropriate multifaceted approach to management of their condition to maximise opportunity for recovery and retention within the Service.

All stages of prevention are appropriate within the ADF; however, primary prevention is most likely to have the greatest impact and thus provide for the greatest opportunity for manpower conservation. It has been argued that suicide prevention should target more broadly based risk and protective factors, rather than focusing specifically on suicide. The aim of prevention programs should be to reduce not only suicide, but also other social, behavioural and health problems. The costs of primary level prevention programs can then be applied to achieving multiple health and mental health outcomes.

The effectiveness of many promotion and prevention strategies is yet to be demonstrated, although interventions to improve people's mental health literacy, optimistic outlook, problem-solving skills, resilience to life stress and social support appear to be helpful. In recent years the United States Air Force has adopted a community approach to suicide prevention and preliminary findings have indicated a significant reduction in the suicide rate. Within the ADF, the Defence Force Psychology Organisation is trialling a suicide awareness and prevention training package within Army Training Command Units. The efficacy of the trial is currently being evaluated and the package is being considered for tri-Service application.

Intervention
Interventions measures for suicide are often debated as they can only hope to reduce the suicide rate, not eliminate it, and include:

a. Access to counselling from an appropriately qualified person.

b. Education of colleagues, commanders and professional personnel as to the warning signs of suicide.

c. Encouragement for people at risk or identified to be at risk to self refer for help.

d. Management guidelines for professionals to detect, assess and treat at risk members.

Therapy for depression appears to be associated with a reduction in suicide rate, as does restricting access to methods commonly used to commit suicide, restricting opportunities for imitation, and the introduction of education programs. At a secondary level, access to appropriate psychiatric care and crisis intervention is recommended.

Conclusion
Suicide prevention is an important part of preventive health. The ADF is currently experiencing rates of suicide comparable to the Australian population in the younger
age groups when theoretically this rate should be lower. The ADF is also experiencing significant rates of mental illness resulting in significant morbidity, the true magnitude of which, can only be estimated. It is unclear as to whether life in the military carries unique risks of mental illness and suicide. The situation warrants a tri-Service program to prevent, detect and treat mental illness across the ADF.

**Recommendations**

1. **Surveillance.** Improve the surveillance of mental health, self harming behaviour, suicidal gestures and suicide attempts in the ADF to incorporate:
   a. data on the incidence of these issues;
   b. working days lost as a result of these issues;
   c. data on the utilisation of multiple areas in the treatment and support of these individuals; and
   d. data on outcomes.

2. **Investigation.** Establish a tri-Service, multidisciplinary project team to further investigate mental health, self harming behaviour and suicide issues in the ADF, and develop an ADF Mental Health Strategy. Investigation should include prevention and intervention measures and development of ADF protocols on the assessment and management of suicide and related behaviours.

3. Adopt best practice as an interim measure. As an interim measure, until the results of such an investigation are known and a mental health strategic plan is developed, current knowledge can be utilised to assist in prevention and intervention programs. Current knowledge favourably reports the adoption of community based suicide prevention programs, such as the one already being trialed and evaluated by the Defence Force Psychology Organisation, with the view to adopting the program Defence wide in the future.

**References**

A View from the Front

Operational Lessons Learnt - Fact Or Fiction

B.C. Wright

Operational art is the skilful employment of military forces to attain strategic goals.

Introduction
Between the end of the Vietnam War and 1991, Defence Health personnel had little opportunity for overseas deployments. The only chances to practice their skills under operational conditions, at unit and sub-unit level, was on unit exercises and major Joint and Combined activities such as the Diamond Dollar series and the Kangaroo Exercises of the 1980s. Since the early 1990s, however, the number of operational deployments have escalated and as we enter the 21st century some critics would say that there has been an over abundance of operational exposure for some personnel. Such real time operations have provided the opportunities for Defence Health Services (DHS) personnel to put into practice all their training and to enhance health skill competencies.

Each exercise or operation has mandatory 'lessons learnt' produced. In fact, there is currently a proliferation of databases designed to capture such information. However, over time, when these captured pearls of insight have dimmed in our minds, do we in DHS really take any notice of them? Furthermore, once inertia and individual egos take control, do we have a very limited understanding of the thought and effort our colleagues have put into the provision of these writings? Keeping this in mind, I decided to discuss these issues as I see, on a daily basis, the results of lessons that are not learnt. I have concentrated throughout this paper on Rwanda and East Timor (EM) as I have first hand knowledge of these two areas.

Aim
The aim of this paper is to provide comment on procedures observed, potential improvements identified and what, if anything, has been done to implement these improvements.

Lessons Learnt
Some would say the term 'lessons learnt' is a misrepresentation of fact and that 'lessons observed' would be a far more accurate term. When one examines a number of operational post activity reports, there is a certain logic to this comment as the replication of the same issues hardly indicate that a learning process having taken place. Given the many presentations, at a local and international level, on this topic, I will concentrate on the deployment of a fit and healthy force, casualty prevention, the deployment of formed units and jointery, provision of Reserve Medical Specialists, health logistics and 'Lessons Learnt' databases.

Deployment of a Fit and Healthy Force
Today, the Defence health focus is firmly on maximising the numbers of fit personnel for deployment. The focus of health care has shifted from intervention to prevention and there is increasing recognition of the importance of psychological health as a component of health and fitness. Identification of health risk factors and the availability of appropriate care levels contribute to this focus. Such an approach provides commanders and operational planners with the operational health and fitness standards for their troops. Operational orders designate the health fitness standard for deployment, which is normally medical classification one (no medical restrictions) and dental class one (fully dentally fit and not undergoing any dental treatment); appropriate health countermeasures, and other health specifics for that operation. Waivers for personnel who do not meet these health requirements can only be recommended by the mounting/designated operational

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2. LTCOL Bev Wright is the SCI Health Plans within the Defence Health Service Branch.
authority. This task has usually been allocated to Colonel Health, Land Command Health Services, as many of the operations are land-based. Navy and Air Force make recommendations for their own Services. Frequently, this task has been allocated to the senior medical officer of the formation who becomes the recommending authority for the waivers to the Commander. So how are troops kept at operational preparedness?

For Army, there is the Army Individual Readiness Notice (AIRN) which indicates that an individual is supposedly ready to deploy, on 30 days notice to move, into an operational area. For Air Force, there is the Operational Readiness Badge (ORB) which means they are right to be taken off the shelf, dusted off and ready to deploy. Navy will also come on line with a Service Readiness Badge (SRB) for individual readiness in January 2001. However, operational reports indicate that individual readiness notices cannot be entirely relied upon. For example, for East Timor, waivers were sought for Japanese Encephalitis Vaccination (JEV). JEV had been introduced as a standard Australian Defence Force (ADF) vaccination two months before the ADF deployed into this area. Consequently, some 11,260 personnel on twenty eight days notice to move were to be vaccinated. The three Services were requested to provide accurate figures so that an effective immunisation program could be instigated. For a variety of reasons this did not occur, reduced vaccination schedules were requested and medical waivers subsequently sought. This begs the question as to why DSHB pre-plans and revises vaccination schedules on a frequent basis to ensure that appropriate schedules are provided in a timely manner? Waivers for medical classifications will always be sought for limited skill sets and, as the ADF continues to downsize, this will continue; however, for vaccination schedules there should be no requirement to seek medical waivers. ADF personnel should be aware of their health pre-deployment standards.

There are exceptions. When the ADF deployed into Irian Jaya in 1998, an immunisation waiver was given for JEV under strict guidelines requiring personnel not to deploy to areas under 300 metres. Therefore, it is imperative that educational and advertising programs are used to provide updated and changing health information. This is not an isolated issue as medical classification and vaccination waivers are and will continue to be requested for all deployments.

Another example was the recent impending deployment of ADF personnel into the Solomon Islands just a few months back. The short warning order highlighted the requirement to have health countermeasures ready to go. However, Operational staff 'edited' some aspects of the health countermeasures when including them in the Warning Order and Operational Instruction. Consequently, malaria prophylaxis medication was not included in the preparation of deploying personnel. This was subsequently rectified when health planners identified the omission. Whilst Defence health has a responsibility to recommend health countermeasures, it is a command decision as to whether they should be carried out. It is important that operational planners take note of these recommendations and do not arbitrarily change information provided without rechecking with health planners.

So just what can DHS do to influence operational planners? The Joint Publication 2060 (JP2060), Chapter Six, Paragraph 6.27 states ‘that failure to identify personnel who do not meet health and fitness standards will have effects ranging from degraded individual performance to mission critical failures.’ Therefore, the aim should be to ensure a fit and healthy force and to develop a system whereby this standard can be maintained to optimise individual health readiness. If DHS progresses along these lines in the long term, there will be a conservation of manpower from reduced injury, illness, disability and premature death. Only by continually promoting health issues at the strategic, operational and command levels, and the ongoing education of these personnel, will Defence health develop the profile that is needed to bring about effective change. Health is a major component of operational planning and indeed can, and has been, a major war stopper, such as JEV in the initial stages of EM. JEV requires a 38 day immunisation schedule. Therefore, for the adequate preparation of deploying personnel, this needs to be done in a timely and appropriate manner. Commanders at all levels need to be cognisant of such requirements.

Implications for Pre-deployment and Post-deployment

While there is a need for a fit and healthy force before and during deployment, there is a continuing requirement to provide a seamless extension of a pre-deployment mechanism that will optimise individual readiness prior to deployment as well as continuing post deployment. Currently
Defence Health Services Branch (DHSB) is developing a tri-service medical assessment process that will facilitate this. This will include a five yearly medical with an annual health assessment.

Casualty Prevention

Effective casualty prevention conserves deployed force manpower and enhances combat effectiveness. On the other hand, inadequate casualty prevention degrades individual and unit health and performance, becoming, at times, the leading casualty cause as it has throughout history. For as long as there have been warring factions, mortality and morbidity from disease has often decided the battle before it began. Casualty prevention must focus on minimising the impact of operational, environmental, and occupational threats which ADF personnel will be exposed to on operations. ADF overseas deployments are very seldom to countries which one would usually choose as a vacation destination. Therefore, it should be mandatory that environmental/preventative health teams and Health and Safety Management personnel deploy on operations as early as tactical considerations allow.

A comparison between Vietnam and EM indicates the incidence of malaria is higher in the current operation in Timor than it was in South Vietnam thirty years ago. This is in spite of the significant leap in knowledge about the disease. In less than a year there had been 300 cases of malaria amongst Australian troops deployed to EM. This compares most unfavorably with a similar number of malaria cases in Malaya over six years and 933 malaria cases in Vietnam over seven years. In Vietnam, ADF personnel were hand fed their malaria prophylaxis which was signed off in a roll book. Whilst not to the same extent, the battalion group in EM started to closely supervise compliance with malaria prophylaxis when large numbers of the unit became ill. However, drug prophylaxis alone is not sufficient and effective utilisation of preventative assets is essential. This may be difficult when the security situation is uncertain and in the heat of battle personnel will not, and probably should not, see preventative health as a high priority. It is interesting to note that within the first forty days of the deployment to EM, there were large numbers of Non Battle Casualties injuries as well as a large number of unauthorised discharges of weapons. This may be due in some measure to fatigue and working conditions; however, as history shows, appropriate training can greatly assist in overcoming these situations.

Deployment of Formed Units and Jointery

One of the principle findings from Rwanda was that formed units or sub-unit manning was the preferred option for any operational deployment. Many will be only too aware of the disruption and angst caused by the formation and deployments of composite units. For example, the first rotation to Rwanda in 1994 was comprised of ninety-three health personnel from twenty-nine different tri-service units around Australia. It took about six weeks for the integration of this group before there was a truly effective working hospital. This is not the best way to do business, particularly with the first group in which is expected to hit the ground running. This integration doesn’t necessarily get any better with subsequent rotations.

Jointery is a notion which what DHS should be, and is, aspiring towards. However, to impose jointery from above causes extreme anxiety at many levels. In particular, is the disappointment of those members, integral to their health units, who are not deployed for the sake of jointery. Formed units who have worked together should deploy together.

Commodore Dowsett, in his presentation of Hospital Ship GRANTALA in World War One (WW1), made the point that the selection of nursing staff for this deployment was purposely from one hospital department. As early as WW1 this observation was made and documented. Team integrity and cohesiveness is still important today. It is disappointing that years later we have not heeded this lesson. There would be no consideration ever given to an infantry battalion being dissected prior to an overseas deployment. As it currently stands, Commanding Officers of the lead Service are required to ask the other Services for the competencies they require to support this joint deployable unit. The consequence of this notion means that some staff will miss out, which does nothing for the morale of the unit nor, I suggest, for longevity of service as many join the ADF is to participate in an overseas deployment. Cohesive, formed units need to deploy and jointery needs to be embraced from the tactical level up. The only way jointery will work well is to grow this notion from the tactical level up.

However, not all is bleak on the horizon. From January 2001, 1 FD Hospital in Sydney, 2 FD Hospital in Brisbane and, as
of September 2000, 3 Forward General Hospital in Adelaide will become Health Support Battalions (HSBs). This is the first step in achieving Joint Level Three health units. 115 of the 153 clinical positions will be designated as ‘may be filled by RAN or RAAF’. However, this will go only part way to solving the problem as the joint positions provided in the HSB are limited to non-command positions. Command positions are to remain Army. A truly joint unit should have joint positions within the HQ elements.

There is currently one joint health facility and as of 1 Jul 1997 Duntrroon Medical Centre became the Canberra Area Medical Unit - Duntrroon (CAMU-D). Currently the commanding officer position is filled by Air Force, the senior nursing position is filled by Army and Navy, whilst unable to fill the medical officer positions, does have some Petty Officer and Leading Seaman positions filled. CAMU-D also takes in HMAS Harman and RAAF Fairbairn. However, outside of this unit jointery is in its infancy. At HMAS Penguin, there is a Medical Officer (MO) from Air Force who is preparing for her surgical training in Sydney. This post is Penguin provides the opportunity for this MO to undertake increased surgical cases in preparation for such training. In 2001, another Air Force MO is to be posted to 3 Brigade Area Support Battalion (BASB) in Townsville for two years. This is an Army unit.

**Reserve Specialist Medical Officers**

DHS relies heavily on reserve specialist medical officers for surgical capacity to support both exercises and overseas deployments. If we look at the twelve month rotations to Rwanda in 1994 - 1995, some specialists rotated through both rotations. This is the current situation for Bougainville (BCV) and EM with some specialist medical officers rotating several times. Furthermore, for Rwanda, a couple of civilian medical officers were given temporary rank and position in the reserves for the deployment because ADF was unable to fill the medical roster rotations for this operation.

There remain ongoing problems with filling medical rosters for the concurrent operations in BGV and EM and the time has come, particularly for the EM roster, that DHS will need to bite the bullet and actively start to contract specialist medical officers into the area of operations to support the surgical team. As unpalatable as this may be to uniformed personnel, Australia has a contract with the United Nations (UN) to provide a surgical team. Whether such services are provided in or out of uniform is of no consequence to the UN as long as Australia meets their part of the contract.

The valuable contribution that Reserve medical specialist and other Reserve health personnel make towards the success of an operation is well recognised within Defence circles. To that end, a number of initiatives have been instigated to compensate in some way for their loss of income and the disruption to their practices and lives. For example, the Defence Personnel Executive (DPE) has initiated the civil practice allowance, which from June 2000 is $1600 per week. There is a minimum of four weeks eligibility and it may be paid up to eight weeks consecutively. This can be repeated as often as required. However, for those members who deploy for less than four weeks, there is no financial assistance.

DHSB has challenged this decision with Director General Personnel Policy Employment Conditions (DGPE) as recently as June 2000; however, DGPE has stated that he will not renegotiate this minimum eligibility period as to deploy personnel for shorter periods is not seen as cost effective. This lack of willingness of agencies external to health is preventing improvement in conditions of service for this group of personnel.

Other areas being addressed include the accelerated appointment scheme for medical officers to fill operational requirements. Currently there is agreement between Army and Air Force; however, as Navy has particular induction training requirements for ships, they have not signed up to this scheme. The issue of temporary rank is also being addressed so medical officers would come into the ADF can be given rank commensurate with their professional qualifications, post graduate experiences, and so on.

With regards to the pre-deployment training requirements for both permanent and part-time medical officers, DHSB has paid for some reserve members to attend the inaugural Definitive Surgical Trauma Course (DSTC) conducted at the Royal Melbourne Hospital in August this year. It is proposed to conduct these courses on a yearly basis with the focus being on military trauma surgery.

**Health Logistics**

Again lessons from Rwanda include the requirement that health logistic support to a mission should be a fully integrated logistic responsibility, and should be
manned, equipped and controlled accordingly. Further, planning must include consultation with specialist areas to ensure all operationally necessary health materiel is provided. When ‘spare capacity’ is being used, consumable items must be allocated to this activity. In fact, since Oct 1999, AUSAid has continued to pay to Defence Health $30,000 per month for the use of humanitarian stores in BGV. Furthermore, there is a requirement to have an experienced health logistician, ideally a pharmacist, in the planning HQs. In the early days of EM, the battalion group deployed without its logistic component. As the force continued to grow, it became very obvious that the deployment of second line Class 8 stores to the force were in disarray. The Logistic Support Force (LSF) at Randwick, Sydney, supplemented its HQs with a health logistics officer who subsequently deployed to EM as part of the newly formed Force Logistics Support Group (FLSG). All didn’t go to plan after arrival in country. This officer became dual hatted as the operations officer and health materiel officer working out of the Forward Surgical Troop in Dili. He did, however, put in place a workable plan for distribution and subsequently a pharmacist was deployed from 9 Force Support Battalion (FSB) to take over the logistics function.

For any operation there is a requirement to have in place a medical logistician and this position needs to be actively bid for. When planning for this key position, there is a requirement to understand the mission. In Rwanda, a health logistician was posted to the HQs in Kigali, his task being to act as a quality controller as Class 8s provided through the UN logistic supply chain were variable to say the least. EM on the other hand was focused on the timely distribution of the product as this was a war zone. In the early days of EM, Class 8 contributed to less than 10% of the stores required; however, for Rwanda Class 8 was the bulk of the stores required. For the above reasons, Class 8 stores should never be deployed without a medical logistician.

Health Lessons Database
I mentioned at the beginning of this paper that there were a growing number of databases to capture lessons provided. Two key ADF ‘Lessons Learnt’ databases have been identified that provide useful information for ADF personnel and operational planners. They facilitate management of ‘lessons learnt’ reports and provide a compendium of useful reports from functional elements of the ADF. They include the ADF Warfare (ADFWC) managed, ADF Activity Analysis Database (ADFAADS) and the Army Combat Arms Training Centre (CATC) managed, Centre for Army Lessons Database (CAL). ADFAADS receives input from predominantly NORCOM, DJFHQ, HGAC, LHQ, HGAST and ADHQ. It was developed following a 1998 COMAST directive. It is the official ADF Post Activity Reporting System and is the official repository of lessons learnt out of EM. Issues submitted to ADFAADS are prepared by units and staffed through the normal chain of command. The reports are reviewed to confirm their validity and the forwarded to a Functional Area Action Officer at the appropriate HQ or the departmental head for staffing. For example, I am the Action Officer for DHSB and I am authorised to receive and staff strategic health reports. Such actions can be viewed on the ADFAADS database at any stage of the staffing process. Unfortunately, ADFAADS is constrained in that it has limited access and is not generally accessible to health personnel.

The CAL database was formed to record experiences during OP Warden/OP Stabilise in EM. Subject Matter Advisors (SMA), except for health, were deployed to EM to collect data for lesson development across the full range of Army Tactical Tasks and across all elements of capability Personnel, Support, Training, Equipment and Doctrine (POSTED). CAL is accessible through the Army Web Site or on DEFWEB. There is now a selection of health lessons from Timor available on CAL.

There are also several overseas military lessons learnt websites, which allow global access to their information. These include the Centre for Army Lessons Learned, US Army Medical Department Centre and School, and the Canadian Army Lessons Learned Centre. The UN also has a lessons learned database, sectioned into different UN operations including Somalia, Rwanda and Slavonia.

Currently DHSB does not have a lessons learnt database; JF 2060 - Deployable Medical Capability has the development of a functional specification for a DHS knowledge network as one of its objectives. This will not commence until FYs 04/05-06/07. DHSB is looking at the establishment of a lessons database with Directorate of Health Capability Branch acting as a repository of health information. Perhaps when there is a single health database available to health personnel of the various lessons observed from
operations, more effective planning with better outcomes will be facilitated.

Conclusion

The operational deployments of the 1990s have provided DHS with a wealth of knowledge as to how it should do its business. So how far have we come in the application of these operational lessons learnt? Are they fact or fiction? The cynic would say that, in many cases DHS, pays lip service to these lessons as repeatedly the same issues arise. However, there are changes taking place, albeit slowly. My aim in this paper is to provide comment on procedures observed, potential improvements identified, and what, if anything, has been done to implement these improvements. DHS has identified significant issues and is endeavouring to address these. However, it is up to each of us who work within the uniformed health service to observe, monitor and comment on how DHS can promote and improve our input into how the ADF meets it's commitments. Having a central repository of health lessons available to health areas will help in some way. At the end of the day, however, we are the folks who have to put up with the uncertainty, threat and imposition if the conditions are not right so use your voice to bring about the changes you believe will enhance the system we have to work in.

Health and the Aging Terrorist

C Williams

Introduction

In discussion of terrorism to date, little attention has been accorded to the long-term health of terrorists. "Who cares?" you might say. We may not be concerned about the health of terrorists from a caring point of view, but poor health could affect terrorists’ effectiveness, ability to make rational decisions, vulnerability to arrest, and reduce their life expectancy. Many of the radicals of the 1970s and 1980s are now starting to suffer health problems.

There are a number of reasons for this, some of which also account for the well documented reduced life span of police officers! These include the long-term effects of stress, poor diet, long hours - and resultant marital and family problems; and, additionally, in the case of terrorists, lack of regular access to quality healthcare and the long-term effects of living rough and combat trauma.

Usama bin Laden

Among many terrorists who are experiencing health problems is superterrorist Usama bin Laden, who has been linked to a number of attacks on US targets, including the August 1998 East Africa bombings.

Usama bin Laden was born in 1954 into a rich Saudi family and would have had excellent health care until he departed to fight in the anti-Russian jihad in Afghanistan in 1979. He lived rough for the next 10 years before returning to Saudi Arabia in 1989. The Saudi Government ordered him to leave in 1990, because of Saudi embarrassment at his influential opposition to the deployment of US forces to Saudi Arabia under Operation Desert Shield. Bin Laden then travelled to Sudan and remained there until 1996. He was forced to leave Sudan after US pressure on the Sudanese Government, and moved to Afghanistan. Since then his movements have been limited to Afghanistan and, perhaps, the northern border areas of Pakistan.

In 1999, reports started to surface that bin Laden was suffering from major health problems, including kidney failure.

Simon Reeve, in his book The New Jackals, published in 1999, claimed that the kidney failure was the result of a CIA-sponsored assassination attempt, involving an assassin named Siddiq Ahmed, who was paid US$267,000 to poison bin Laden. According to Reeve's information, it was only partially successful, causing the

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target, Usama bin Laden, to suffer from acute kidney failure.¹

According to a report in Defense & Foreign Affairs Strategic Policy earlier this year, bin Laden’s health deteriorated markedly in the early winter of 1999/2000. He suffered debilitating pain that evolved into bouts of depression. By January 2000, bin Laden’s overall health had deteriorated to the point that his closest confidants feared he was dying. Arab doctors, who had been rushed to Qandahar from the Persian Gulf, prescribed complex treatment that was not available in either Afghanistan or Pakistan.²

Dr Ayman al-Zawahiri resigned from the leadership of the Egyptian Islamic Jihad (EIJ) in order to devote himself to bin Laden’s al Qaeda organisation. Zawahiri was one of Egypt’s leading paediatricians before he became involved in the EIJ and went underground. He became increasingly involved with bin Laden’s health issues.²

According to Bodansky, in January 2000, Dr al-Zawahiri arranged for an eminent Iraqi doctor to examine bin Laden in Afghanistan. The Iraqi doctor prescribed a treatment involving dialysis, a series of injections and intravenous medicine-delivery, as well as an assortment of medications.²

A thorough search of Afghanistan’s medical facilities led to the discovery of a non-operational, but fixable, Soviet dialysis machine and related equipment, in the basement of a derelict Kabul hospital. The hospital was originally built to cater for the needs of the late President Najibullah and the ruling elite.²

Dr Zawahiri relied on his long standing connection to the Chechen mafia, which dates back to the early 1990s, to have them find and deliver the parts needed for the dialysis machine and other medical equipment prescribed for bin Laden.²

The equipment needed was smuggled to Afghanistan via Iran and then on to Afghanistan. It was installed at bin Laden’s forward headquarters near Sarobi, Laghman Province (between Kabul and Jalalabad).²

The medical team, led by the Iraqi doctor and Zawahiri, immediately got to work. Within a month or so they had bin Laden back on his feet again, to the point that he could attend brief meetings.²

By late March 2000, bin Laden was healthy enough to make a rare public appearance. He attended a high level meeting with the Taliban leadership, convened to discuss President Clinton’s upcoming visit to Pakistan. According to witnesses, bin Laden looked frail, his face thin and drawn. But he was well informed, lucid, and active throughout the lengthy meeting.²

Conclusion

One can only speculate on the impact of the death of bin Laden. It would certainly have been a major setback for al Qaeda and Sunni extremists internationally.

An outcome of his recovery has been an increased commitment on the part of al Qaeda to assist the Islamic fighters in Chechnya and Dagestan. There has, this year, been a surge in Islamic fighters passing through the training camps in Afghanistan and Pakistan, en route for the Caucasus.³

Bin Laden was more fortunate than other terrorist might be in similar circumstances because of the substantial finances available to him, and his popular support within the Arab World. The same is not necessarily true of other sick terrorist leaders, like the notorious Palestinian, Abu Nidal, seriously ill from cancer in Iraq.
Whether you believe that bin Laden was poisoned, or has health problems induced by his frugal and demanding lifestyle, the fact remains that his health has probably changed the operational orientation of al Qaeda, for the time being at least, and has made bin Laden a less dynamic individual.

If his health problems are linked to cancer, it is unlikely that bin Laden will be able to secure in Afghanistan the kind of treatment he would need for long term survival. Any attempt to leave Afghanistan would make him vulnerable to betrayal, and arrest by US agents.

Medical intelligence on key individuals is a field that has been largely neglected since the Cold War, but the bin Laden case demonstrates that it is an area worthy of greater resources. Had the vital medical supplies been intercepted earlier this year, bin Laden might no longer be with us.

References
"Whatsoever More ....."

Defence Health, Outreach Health and the legacy of St Luke, the physician

J H Pearn

"Take care of him: and whatsoever more thou spend, .... I will repay thee"

The Parable of the Good Samaritan
St. Luke 10:35

Australians are privileged to live in one of the freest, richest, safest and healthiest nations on earth. The common indices of health - such as infant mortality rates and life expectancy - place the collectivity of Australians amongst the fortunate few, seen in world perspective.

Australia, with its enviable high standard of living, exists in a world and specifically in a region where the contrasts of physical and social health are stark. Despite this, our national regions of interest have enjoyed relative peace; and although civil insurrection has occurred in many of the countries of South-East Asia, no country has threatened the territorial sanctity of a neighbour for three decades. It is in Australia's national pragmatic interest to maintain cordial relations with its neighbours. Such potential for peace can be promoted in many ways. One such is improved by working towards a more equitable standard of health for our near neighbours of geographic interest.

There exists, however, a stronger personal motive - one experienced by all members of the health professions, whether they be civilians or Servicemen and women. That ethic is that, from our position of privilege, there is an accepted self-imposed altruistic obligation also to reach out to help neighbours in need. In this context, a part of Australia's foreign policy has been to encourage the export of health, certainly in the form of AUSAID Health Projects; and certainly in the promotion of civilian health projects delivered so well by non-government organisations. More than ten of these latter reach out with enthusiastic volunteer services and great generosity to help the sick and injured of developing nations.

Since 1946, Australian Servicemen and women have deployed on some 49 United Nations' Missions. Such have involved fighting in hot operations to secure a just peace; the monitoring of ceasefire lines in places of both national and international turmoil; and bringing technical aid and skills to many military-appropriate tasks ranging from biological warfare surveillance to landmine clearance.

Australia also exports Defence health. In the past decade, at least seven of the Nation's last ten overseas deployments have included medicine and health as core components of such operations. Not all have been mounted to help geographical contiguous nations at time of trouble. A number have been mounted for altruistic purposes that a stricken nation, far from Australia, might have the chance to stabilise and re-arise from natural or man-made disaster. The Defence Health Service has played key roles in the Western Sahara, Somalia and Rwanda in Africa.

The role of Australian Defence Health personnel in the post-Rwandan genocide will stand as one of our nation's most significant deployments, when the audit of history judges the nation's contribution to international health in the 20th century. The United Nations is often criticised for its apparent inefficiency; but those who saw the outcome of free and democratic elections in Rwanda, five years to the month from the time of the appalling genocide (1994) in that country, will appreciate just how much good can be achieved. Australia provided the medical contingent to the 7,500 strong United Nations' force. The work of several hundred Servicemen and women - doctors, nurses, medics and other health professionals - contributed most significantly to the saving

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2 Major General John Pearn, AM, RFD, has just retired as the Surgeon General, Australian Defence Force.
of life and the prevention of disease. More importantly, the bearing and collective persona of Australian Servicemen and women acted as role models for those who have rebuilt the health service in that nation.

Australian Servicemen and women have served on the island of Bougainville since 1997, following the nine-year devastating civil war in that troubled population. Australian Servicemen and women are unarmed on that deployment; and in the absence of any authority other than that of village law, peace is maintained by the force of personality of the uniformed Australian personnel on that island. A very important component of that force is the Combined Health Element (CHE), comprising a Forward Surgical Team, general duty medical officers, skilled nursing care and medical assistants. More than 70 percent of that deployment has involved women and children. One in four of all adult women in that population is pregnant at any one time. The maintenance of health amongst that disadvantaged population has been one of the significant contributions to Australia’s military outreach to help a neighbour.

Australia’s operations in East Timor commenced on 6 September 1999 and for the first six months comprised 5,700 Service-personnel, of whom ten percent were women. Our medical teams have led the establishment of a Field Hospital there termed a Forward Surgical Team (Heavy). The military hospital in Dili is based on a team of two surgeons, an anaesthetist, an intensivist and a public health expert.

For the first six months of that deployment, Australian health personnel served with our colleagues from the Singaporean Armed Forces; and have proved the worth and the potential of such multi-national, cooperative health deployments. In the first six months of that operation (until 19 February 2000) more than 1,200 victims were admitted to the ward of that hospital, some 500 of them being indigenous East Timorese, who in the post-Referendum turmoil of 1999 had no other “Level 3” sophisticated medical aid which included provisions for life support and specialised post-operative nursing for major surgery. No soldiers of the multinational force (INTERFET) were killed by enemy action in that engagement, but infectious diseases such as dengue and malaria have been a particular challenge.

Figure 1: St Luke Memorial stained glass triptych window, Soldiers’ Chapel, St. Saviour’s Cathedral, Goulburn, NSW. The window portrays the passage from the Gospel of St. Luke (Ch 10:30) which recounts the parable of the Good Samaritan and the ethic of best-practice, pre-hospital care. Photo by the author, July 2000.

The writer has recently taken part in an international forum with some 32 Surgeons General, representing the armed forces and the population of three-quarters of the planet’s total population. With a concept of support for nations who remit is to preserve an honourable peace in the world, multinational groups whose responsibility is military health and whose ethical basis are the Geneva Conventions, can be an important albeit intangible force for the preservation of peace. In discussions among those Surgeons General it becomes obvious that the challenges that confront individual nations such as Australia are the challenges that confront honourable nations everywhere. Such include questions of preventive medicine, keeping both the military forces and civil populations free from the scourge of tropical diseases, the skills needed for doctors and health teams to work as members of multi-national forces and the threat of potential bioterrorism.

The legacy of St. Luke, in the parable of the Good Samaritan, is the ethos which underpins much of the Australian Defence Force international outreach aid; and is one of the foundations of best-practice medical ethics in the contemporary Service context.
(Figure 1). A major part of that parable is that in the follow-up which occurs after emergency stabilisation and immediate lifesustaining support, that many resources will be still required in the post-operation or strategic sense.

Considerable advocacy is expended to maintain and apportion sufficient resources both for national health and for health contributions to stricken nations. Such resources are apportioned by Australia’s Federal Government to supply, inter alia, the medical budget needed for such humanitarian emergency deployments such as those mounted by Australia in the last decade. Not all resources can be provided from a nation with a relatively small population. Much is given by the dedicated service and altruism of the men and women who represent our nation in the health field, in the uniform of the Australian Defence Force during their overseas deployments. Extra value and the giving of extra resources consists of these non-combatant individuals nevertheless "fighting about their weight" specifically in the context of the delivery of health skills. Indeed, "whateover more is demanded" is given by such servicemen and women of whom our Nation can be truly proud.

Military Health Symposium 2001

The University of Sydney
Department of Surgery

Reputation General Hospital Concord

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Review Articles

The diagnosis and medical management of chronic Posttraumatic Stress Disorder (PTSD) in military veterans (I)\(^1\)

B White\(^2\)

This is the first part of a two part series on the diagnosis and medical management of chronic posttraumatic stress disorder (PTSD) in military veterans. This article looks at the diagnosis and prognosis of chronic PTSD. The second part will look at the medical management of chronic PTSD.

Many treating professionals face the treatment of chronic PTSD with a sense of futility and hopelessness. Overall my clinical experience is that substantial improvement and stabilisation is the common outcome with comprehensive treatment but we do not see complete resolution or cure. This improvement indicates that the approach to PTSD can be one of realistic hope. The process of achieving improvement takes a prolonged time, often several months to two or three years to get to a significant level of stabilisation. This involves management across a range of approaches: biological, psychiatric, psychological, and social, and based on realistic aims and expectations.

Soldiers go to war for many reasons but for many underlying the desire for adventure, to be with their mates, to see the world etc., is a sense of serving their country. They seek to live up to the ANZAC tradition, even though this may seem an unfashionable sentiment at times, therefore less often stated, and certainly more selfless then the defence force recruiting advertising we see. Nevertheless this desire to serve their country is a major motivation.

At the commencement of his novel about the French military in Indochina and Algeria, Jean Larteguy quotes from a Roman Centurion writing to his cousin in Rome.\(^1\) Part of this said, in effect, that they had been told on leaving their homeland that they were leaving to defend the rights of the citizens of their homeland and were protecting their civilisation.

Therefore they had not hesitated to spill their blood and sacrifice their youth and hopes. They did not regret anything until told of the treason in Rome and they could not believe that it might be true that the citizens in Rome had abandoned them and vilified their actions. If this were to be so, if they had left in vain their whitened bones in the desert, then take care of the anger of the Legions.

The experience of war has long been known to change a person. Men and women have come home from war with a changed outlook, becoming more withdrawn, moody, unhappy, and irritated with others unknowing, uncaring happiness and their thereby rejection of the soldiers suffering. The soldiers are resentful they bore the burden of fighting for their country and now suffer with the tortured nightmares and intrusive memories of the experience of war. They know, in a deep way of knowing based on experience, that life is cheap and precarious while most civilians are oblivious to the truth of the violence, ferocity, death and mutilation of war. An often unbridgeable gap between the veteran and the civilian community may be produced.

The contrast between the values and mores of warfare and those of peacetime civilian life, especially in such a stable country as Australia, further worsen the contrast with the persisting nightmares and


\(^2\) Dr Brian White, MBBS, FRANZCP, is a consultant psychiatrist whose private practice consists largely of military veterans, former serving military personnel and current military personnel. This article is based on his clinical experience in treating a range of military and ex-military patients. Although the majority of veterans are Vietnam veterans, others have varied from veterans of World War 2 up to the East Timor deployment.
memories of war and more alienate the military personnel. The resentment of the veterans towards this contrast is made worse when they have been rejected, abused and reviled. The very contrast between peacetime civilian life in Australia and the traumatic experiences in military service, for example in Rwanda, may actually contribute to the development of PTSD, since service personnel may not be conditioned and not expecting the degree of violence.

What is Posttraumatic Stress Disorder?

PTSD is considered a form of Anxiety Disorder. It is based on the human response to exposure to a traumatic event involving actual or threatened death or serious injury to self or others. It can be considered the normal response of a human being to exposure to severe stress. In chronic PTSD there are Biological, Psychological and Social effects.

PTSD is mitigated and exacerbated by a range of interactive factors. On one axis the more severe and prolonged the exposure to trauma the higher the chance of developing PTSD. More moderate exposures to trauma may still induce PTSD but in such cases the pre-morbid experiences, strengths and weaknesses, and the exposure to stress after the traumatic experience, may have more significant impact on the onset and prolongation of PTSD. However the traumatic experience is still the crux and clear precipitant to the syndrome, as indicated by the content of the re-experiencing phenomena.

Chronic PTSD is a Complex Area

PTSD is a complex and interactive process, and the complete picture cannot be described in one article. Although the core of the symptoms is encapsulated by the DSM, PTSD is much more complicated and involves the way human beings process traumatic experiences by a psychological process, the subsequent impact on their social structure, relationships and occupation. In the chronic condition, there is a process of inducing underlying biological change, at a probable neuronal level, and at a chemical level, including in the neurotransmitters and in the way the Hypothalamic Pituitary Axis is regulated.

The core issue is that patients suffer from PTSD. This suffering also affects families, and friends, particularly spouse and children. The aim of management in a chronic medical condition is not a cure but effective and realistic management to alleviate suffering and to stabilise function. This includes specific management of different aspects of the PTSD, by medication, psychological therapies, family intervention and changes in lifestyle including the reduction in stresses in life.

PTSD is not the only psychiatric response to trauma, as trauma may induce almost any psychiatric illness, such as depressive disorders, other anxiety disorders, adjustment disorders, and psychotic disorders.

PTSD often occurs in patients who have had other physical injuries and illnesses, including wounds from military service. There may subtle degrees of brain injury which produce changes in apparent personality function. Hearing loss, often with associated tinnitus, is common from military service. Hearing loss has pervasive effects, and will influence the clinical interview and the function at home and work. Many have learned to appear to hear when they do not, as a way of bolstering their failing self esteem. Such self esteem is often under threat due to their sense that their bodies and their minds are "failing".

PTSD is a much more complex and interactive process than a simple reading of the DSM diagnostic criteria. It is a syndrome with some lack of definition of the limit of what is and is not PTSD. It should be borne in mind that the diagnostic criteria for PTSD under the DSM are the result of deliberations by an expert committee. This inherently entails some compromises. The diagnostic criteria do encapsulate the major features of the core of the syndrome. It is not exclusive nor does the DSM intend this is so.

The most critical diagnostic criteria are the category A. exposure to traumatic experience, with a sense of fear, hopelessness, helplessness, and category B. re-experiencing phenomena.

Re-experiencing Phenomena

In clinical practice in military veterans recurrent distressing dreams relating to the traumatic experience, also termed nightmares, are one of the most common and enduring features of chronic PTSD. Many veterans are clearly dreaming, but have little recall of the content of the dreams.

The dreams in clinical practice are of two main types;
(1) recurrent repetitive dreaming of the actual incidents, which may undergo some distortions over time, and
(2) recurrent repetitive dreaming of what might have happened. This second form of dreaming is based on the subconscious processing of the fear at that time. A
common example in many infantrymen is nightmares of weapons failing to fire or running out of ammunition.

Distressing intrusive memories are often brought on by subtle reminders such as sounds and smells as well as the obvious reminders such as watching documentaries about the Vietnam War and movies such as "Saving Private Ryan".

Flashbacks are specific phenomena where the patient has a sense of almost being back there and may involve sights, sounds, smells and even touch. They are therefore one of the more intense forms of re-experiencing symptoms. In my experience they are not particularly common. A lot of veterans who have heard the term 'flashback' use this term when talking of their experience of having a flash of intrusive image of a traumatic experience almost like seeing a photograph for a brief period. This is properly considered a form of intrusive memory.

There are other associated symptoms generally called avoidance and arousal symptoms. In military veterans sleep disturbance is salient. The most common pattern of sleep disturbance is early morning waking which is probably related to the effects of disturbing nightmares and depression.

Once present for any length of time this may become habitual as part of the established daily circadian rhythm. This is less responsive to simple hypnotic medication. Disturbed and restless sleep often has associated excessive sweating, talking and at times flailing of arms. This often encourages the spouse to sleep in another bed. The veteran may wake in a start and may come up fighting if woken.

In military veterans irritability, anger, agitation and short temper are common in PTSD and depression, while overt violence is much less common. This may be partly due to being desensitised to violence and the experience of warfare. Part of this experience is that most will have made a decision to kill first to protect themselves and their family and have a preparedness to carry out this intent. This is usually mitigated by their professionalism as soldiers and their military discipline. Furthermore they generally prefer to be socially isolated and less commonly become involved in situations that may bring out violence. Violence may be more likely with excessive use of alcohol.

Guilt may be common. This is a complex issue, and may relate to a wide variety of aspects of the traumatic experience, such as regret for not doing certain things, or for surviving when a mate did not.

Heightened Vigilance is common. One wife described her veteran husband as 'patrolling the aisles' in the supermarket, very much as a forward scout looking out for the enemy.

**Family Effects**

There are commonly many family issues and disturbances in PTSD. Some of the family conflicts relate to the general military training and experience producing rigid expectations, based on a rigid military lifestyle.

The veteran is often at significant emotional distance from people including the family. This relates partly to the process of the syndrome itself and partly relates to the experience of combat, as well as military training. The traumatic experiences are therefore difficult for veterans to share with anyone who has not experienced similar conditions.

**Diagnosis and Differential Diagnosis**

Diagnosis itself formally is best based on the DSM system of diagnosis (for reliability). However, traumatic experiences produce changes in functioning that are not simply delineated by the criteria for PTSD.

Many of the superficially similar problems in veterans with PTSD may be due to other conditions: the effects of alcohol abuse alone, other anxiety disorders, depressive disorders and personality disorder. However, the effects of chronic PTSD often produce features of apparent personality disorder that are in fact a product of PTSD. Other traumas in life may also produce a PTSD.

**Co-morbidity**

Severe chronic PTSD is almost always found with Co-morbidity, (existing in combination and often as a result of PTSD) anxiety and depressive disorders. Commonly these include Major Depressive Disorder, Agoraphobia, Social Phobia and Panic Disorder. Substance Abuse, including alcohol and more rarely illicit drugs and very occasionally anabolic-steroids. In the military veterans from Vietnam, alcohol abuse has been very common and to a significant extent part of an attempt to self-medicate. Psycho-somatic syndromes such as headaches, irritable bowel syndrome and bruxism are common. There is a risk of suicide in PTSD and co-morbid conditions.

War and military service related PTSD may be exacerbated or become overly handicapping by the stress of other events in life. The onset of PTSD, and certainly exacerbation of PTSD, may relate to other
events and traumatic experiences in life. Secondary depressive disorders may follow a range of medical conditions, such as chronic hearing loss and chronic persistent tinnitus.

**Time Course of PTSD**

PTSD is a variable condition with a fluctuating course, with symptoms fluctuating over weeks to months, and also over the life span. In the overall life span it is common for PTSD to have some prominent symptoms emerge relatively soon after the traumatic experience, often to then settle or be suppressed. In many cases the symptoms become subdued, as the veteran uses a range of defenses to keep the symptoms at bay, commonly including alcohol and keeping excessively busy.

Symptoms may then re-emerge after many years, often after decades. This is partly due to the traumatic memory being processed in a different memory system, not based on time. We still see World War II veterans who remember incidents as though they happened yesterday, not 55 years or more ago. This process interacts with other stresses, other illness, and developmental stages of life.

In many cases the symptoms become accepted as part of normal life, such is the chronicity of these symptoms. It may be their veteran mates who identify they have a PTSD as they have often undergone a similar experience.

**Why Now?**

It is common in clinical practice for the most severe effects of PTSD to not emerge for some time and have an exacerbation in middle age, for many this is some 30 years after their war experience. There are various reasons for this. Common reasons for this later exacerbation are increasing age, being physically less robust, in some cases the intercurrent stresses of serious physical illness that become more common with increasing age, the developmental issues of aging and of being more aware of mortality, having children, and exposure to significant reminders of the traumatic event. Many become introspective as they grow older, which is a normal developmental process. In other words they tend to look back on their lives and try to seek meaning in their lives.

There are occupational and work stresses, including approaching redundancy or retirement. The alcohol intake used to suppress the symptoms may also contribute to the worsening of the PTSD by a range of mechanisms, including organ damage, mood disturbance and sleep disruption.

The effects of further stressful life events can contribute to the onset of exacerbation of the PTSD. For example further stresses in the police or in the military such as deaths in training. Such incidents on the television or news can be powerful reminders that exacerbate PTSD.

Many have children who are teenagers or young adults and are of an age where they remind the veterans of themselves at the age when they went to war. For many there is a determination that their children should not be exposed to be experiences that they had. In some cases they are asked by their children about their experiences in the war and this may bring back unwanted memories.

PTSD is far more widely known in the medical and psychology professionals and more likely to be identified, or at least sent for assessment. Another process is that of the effects of the veterans organisations. There is a process where veterans meet, often at a reunion, and veterans who know about their own PTSD condition recognise that mates have a similar problem. They encourage them to seek assistance, to receive a recognition of their condition and seek effective management and treatment.

PTSD fluctuates in severity often as a result of additional stresses, anniversaries such as being wounded, of a contact, or commonly with any other significant reminders. In Australia there are particular days in the year that often bring back memories: ANZAC Day, Remembrance Day and Vietnam Veterans Day. On 18 August the anniversary of the Battle of Long Tan. The media frequently show documentaries and short news clips around such times. Units often have reunions at these times.

Reunions are a source of ambivalence: they provide mutual support and understanding, but also trigger distressing memories. The best way to handle this depends on the individual. On ANZAC Day many veterans only go to the Dawn Service. In Canberra, there can be 10,000 people around you but in the dark you can feel alone with your grief and do not feel embarrassed.

Many veterans with PTSD in milder stages work hard so as to keep busy all the time and not allow themselves time to think about the intrusive memories. They often present the image of being workaholic and driven. Therefore they are rarely home and this contributes to family disruption. They hope to also tire themselves out so as to help improve their sleep. However, years of poor sleep contribute to a process of being
chronically fatigued with consequent reduced drive and energy which contributes to the breakdown of the defence of keeping busy.

In many ways this process of being chronically fatigued combined with subtle cognitive changes, especially of poor concentration, and a reduced capacity to cope with any stress, is the most disabling aspect, and often least amenable to improvement with active treatment.

Why Vietnam?

PTSD is seen in serviceman who have been in a wide range of traumatic experiences in military service but Vietnam has been of particular note. This is partly historical as the formal diagnosis developed as a result of the upheaval from Vietnam in the USA. The Vietnam War has particular significance due to a number of factors. For the infantry soldier the 12 month tour usually consisted of prolonged exposure to an environment where potentially one could come under attack at any time.

Most infantry units spent the majority of their time out in the bush. They were usually patrolling and moving under conditions where contact with the enemy might occur at any time and from any direction. A fraction of a second could make a difference to life or death, not only for oneself but for one’s mates, for whom one felt responsible. Even in rear echelon areas, traumatic experiences still occurred; bombs exploded in Saigon, the local Vietnamese soldiers and police were often aggressive, threatening civilians and even their allies, and frequently Shot suspects. It was often impossible to tell who was friendly and who was enemy. Many civilian casualties did occur. There were many atrocities perpetrated on the civilians, often by the Vietcong. This is part of the reality of war, which is not well understood outside of the military.

Of significance is the fact that the war was lost. The soldiers themselves were aware of the uncertainty about the political decisions that lead to the prosecution of the war. Of greatest significance for many was their treatment by the population of Australia including by friends and relatives. They certainly were given the message that they were not welcome. After Vietnam, the veterans had the common experience of being rejected and often actively abused. They were called baby killers, murderers and rapists. Their return to Australia was anything but welcome. There are still cases of veterans who were rejected by their close family and parents who still have not resolved this. Therefore the veterans have learned to keep their emotional and psychiatric symptoms to themselves.

Prognosis

It is important to have a realistic understanding of the prognosis of chronic PTSD. The prognosis generally is similar to that of other medical conditions, that is if a patient has had, for example, asthma for 30 years then we would expect to continue to have asthma for the foreseeable future. The same prognosis is true for chronic PTSD. If the symptoms have been present for 30 years to some extent then realistically we can expect that symptoms will persist for the foreseeable future. However, in the same way that asthma can be better contained by appropriate treatment, management of PTSD will often produce significant improvement in the symptoms and quality of life for the veteran.

Military Significance: What is Different about PTSD in the Military

Post-traumatic stress disorder in the military is of significance as a large percentage have developed this after what are clearly severe and often persisting life threatening stressful experiences in hostile environments, especially service in a war, in peace keeping, but also in response to accidents in training. It is likely that if the stress is severe enough that anyone may suffer an Acute Stress Disorder. This is mitigated by many factors: leadership, morale, teamwork and mutual support, fitness, and training. This is a form of acute PTSD and needs a separate article to itself.

Although the picture of the chronic Posttraumatic Stress Disorder is less clear there is certainly the pattern that the more severe the stress the higher the risk of a chronic PTSD in anyone no matter what their strengths or vulnerabilities are.

Remaining in the armed forces is protective as it provides structure, identity, and social support from peers, but it is common for this to delay the onset rather than completely prevent the onset. The loss of structure, identity and support after discharge produces additional stress that may then exacerbate the PTSD.

It has been common in the military for personnel to not report symptoms of psychological distress during their service unless these symptoms are very severe. There is a range of reasons for this; these include a fear of being medically downgraded, of medical discharge, and the adverse effects on promotion and career prospects, and the fear of social ostracism.
in the military environment. In past years personnel have presented to medical services with psychologically generated symptoms and have not been taken seriously, and service personnel have been fearful of the problems with confidentiality in the military.

Military personnel have difficulty in being close to people due to the military ethos, their training for combat, the experience of combat and the underlying psychological defenses against loss. Part of the military socialisation is that soldiers do not show emotion and are expected to cope with any problem. This helps reinforce or even induce a form of alexithymia, a process where the individual has difficulty in describing their emotions, even to themselves and therefore have difficulty expressing emotion. Further, people who join the military may often be already of a personality type where this is more common. Therefore, it is common that veterans may present appearing better than they really are.

The social setting of the military is also of major significance and poorly understood outside of the military. Because the language is ostensibly the same as the rest of the country and the military is assumed to be part of the broader society, there is often a presumption that military society is exactly what people expect in their own lives. This will lead to serious problems in understanding and communication.

Military social structure is different, with its own language with words which have meanings different from the same words used in civilian life. This confuses the unprepared clinician who does not understand the jargon. A knowledge of the language, or jargon, is a significant help; for example knowing what a "contact" or a "grunt" means.

Understanding these aspects of the military can quickly contribute to a good therapeutic relationship and more quickly lead to an orientation about the common significant problems in this group. It gives clues as to the questions that should be asked to obtain an accurate history.

Conversely an attitude that expresses disbelief or lack of understanding of a person’s background and the values they hold dear will usually make patients reticent about discussing those things they find most difficult to talk about. One of the common features of PTSD is that the traumatic experiences are usually not discussed even with close family and friends. It is distressing to talk about many of the symptoms and experiences and it is therefore important to establish a therapeutic situation whereby they can discuss their experiences openly. Military veterans do not easily discuss their problems. Military veterans do not talk easily with people who do not understand the language or culture.

References
History

Australia's First Military Anaesthetist

JH Peam

ABSTRACT

Military anaesthesia is a key specialty in the Australian Defence Force of the twenty-first century. Currently, some sixty Service anaesthetists, all Reservists within the three Services, form the cadre from which all volunteers are drawn for overseas operational deployments. This tradition of volunteer service commenced with the commissioning of Lieutenant John Henry Hill Lewellin (1818-1886) of the Volunteer Force (Rifles) of the Victorian Defence Force in January 1864; and his appointment as Regimental Medical officer of the Prahran and South Yarra Corps. Lewellin was a pioneer anaesthetist and the first to administer an anaesthetic in Scotland (in December 1846); and after his emigration to Australia became a pioneer "etherist" in Melbourne. Lewellin was born in the Fort William Garrison in Calcutta, the son of a cavalry officer of the 24th Light Dragoons. As a doctor-soldier in his later life in Australia, Lewellin became an exemplar of that group of doctors, anaesthetists in this context, who went on to become leaders in the clinical and scientific lives of their communities; and whose volunteer service as specialist doctor-soldiers formed the pivot on which much operational service depends.

Australia's overseas operations necessitate the provision of Forward Surgical Teams to support the Nation's servicemen and women in the event of injury or severe illness. Such teams comprise the basic unit of a surgeon and anaesthetist with their supporting clinical team. The twenty-first century has brought great challenges in the provision of such support – particularly in a Defence Force which contains no fulltime specialists.

There has been manifest success of the health deployments on such operations as the Rwandan emergency (UNAMIR II), the Serpuk tsunamis of July 1998; the Peace Monitoring Group in Bougainville from 1997 and the deployments to East Timor [INTERFET and UNTAET] from September 1999. Currently, some 60 Service anaesthetists comprise the specialty cadre who maintain and develop the intellectual property of the specialty of military anaesthesia in Australia. Such men and women continue a tradition of altruistic volunteer service started more than 150 years previously when one of Australia's pioneer "etherists" was commissioned as a doctor soldier in the Victorian Defence Force. He was Lieutenant John Henry Hill Lewellin (1816-1886), a pioneer Australian anaesthetist and military surgeon who was to become a patron of science in his adopted land. His pioneering role in clinical anaesthesia and his Reserve military service comprise another example of the origins of volunteer specialist medical service as a key element in the Nation's defence.

John Henry Hill Lewellin (1818-1886)

John Henry Hill Lewellin's entire life was linked with the army and with medicine. Literally a "son of the Regiment", he was born in the cavalry lines of the military Fort William Garrison in Calcutta. His father, Henry Lewellin, had joined the British Army in August 1807; and had been appointed to the 24th Regiment of Foot with the rank of Ensign [Second Lieutenant]. He was promoted to the rank of cavalry Lieutenant in the 24th Light Dragoons in 1811. He died on the 11th October 1820, when his young son, the future pioneer soldier-anaesthetist in Australia, was but two years of age.

The fatherless boy, John Henry Hill Lewellin, grew up in the military fortress of Fort William, on the banks of the Hooghli River. The garrison had its base in the Old Fort, built in the 17th century, to protect British traders from attacks by the Nabob of Bengal; and was rebuilt in 1781 as a

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2 Major General John Peam, AM, RFD, has just retired as the Surgeon General, Australian Defence Force.
base and training centre for British troops.

The period prior to the Indian Mutiny was the era when an expatriate British surgeon in India, Dr James Esdaile, was promoting the use of hypnoism - which he called mesmeric trances - as a form of analgesia. It is probable, but unconfirmed, that the future pioneer Australian military anaesthetist was influenced by the potential of achieving a more humane pain reduction for those undergoing surgical operations.

In 1842 Lewellin emigrated to England and studied at St Bartholomew's Hospital in the academic year of 1842-18437. He was admitted as a Member of the Royal College of Surgeons of London on 8th April, 1842 and thereafter practised in Glasgow. The first published cases of surgical anaesthesia, by the Boston dentist, Dr William Morton, were recorded on October 16th 1846. Dr John Lewellin was the first to use ether in Glasgow, on the 4th January 1847. He demonstrated its use before a group of medical colleagues (and the patient's friends) in the extraction of a curious molar tooth. Lewellin disappeared from Glasgow after June 1847 and his whereabouts for the ensuing five years remain tantalisingly unknown. He reappeared in Australia in September 1852, on the Bengal Merchant, a three-masted tea ship which had sailed from London on the 1st April 1852. Lewellin was registered as a Medical Practitioner on the Medical Register of Victoria from 1854; and he remained as a registered Medical Practitioner until his death in 1886.

Lewellin developed a particular reputation in oral surgery, and on occasions advertised as a dentist. One of his particularly spectacular successes was the support and cure of a 12 year old boy with tetanus, whom he treated with aconite and with intermittent chloroform anaesthesia. He administered intermittent chloroform anaesthesia for the tetanic spasms with great frequency over the ensuing period of three weeks. Lewellin advocated the use of chloroform particularly to prevent risus sardonicus, the distressing and potentially painful lockjaw which forms part of the dramatic clinical syndrome of generalised tetanic spasms with opisthotonus - a sign which usually presaged death; and which was so typical of the disease in those years before the generalised use of muscle relaxants became widespread.

Lewellin became a leader in the Melbourne community of his day. He served as a Magistrate; and was also appointed as Vaccination Officer. He loved science, and became a patron of science and supporter of one of Australia's most decorated scientists, the Melbourne botanist, Ferdinand von Mueller. Mueller was to dedicate a volume of his best known work, Fragmenta phytographiae Australiae to his doctor-anaesthetist friend, inscribing in the frontispiece 'To my friend Henry Lewellin, a most skilful Physician'. Dr Lewellin was a vigorous member of the Medical Society of Victoria; and from 1856 his name appeared in many reports of the activity of that Society. He delivered clinical papers on acute dysentery and on pneumothorax. He worked as a clinician until he sustained a stroke in October 1886 and died three years later at East St Kilda, aged 68 years.

**A Pioneer Soldier-Anaesthetist**

Lewellin was one of the world's pioneer soldier-anaesthetists. Like a number of medical colonists, he fused his clinical and technical interests with those of altruistic, volunteer public service. He was to be a forerunner of the Reserve Service anaesthetists who provide the essential clinical skills, which is a sine qua non of all overseas operational deployments today.

In January 1864, Lewellin was commissioned with the rank of Lieutenant, and was appointed Assistant Surgeon in the Victorian Volunteer Force (Rifles). He was posted as a Regimental Medical Officer to the Prahran and South Yarra Corps in Melbourne. His military career followed the progression which was to become so common in the ensuing century. In April 1867 he was promoted to the rank of Captain; and by 1878 had been promoted to Major.

The only known surviving photograph of Lewellin (Figure 1), is one of him in his full military uniform, showing the accoutrements of an Australian colonial surgeon of his day. He bore the straight infantry officer's sword with the hilt device of Queen Victoria's cypher. The backdrop of that photograph, in the studio of Thomas Ferris of Chapel Street, Prahran (from circa 1868), portrays a painted scene of the Yarra River with a tented encampment on its southern banks.
Figure 1: Surgeon Captain John Henry Hill Lewelin (1818-1886), Australia’s first military anaesthetist. His appointment as Assistant Surgeon of the Prahran and South Yarra Corps of the Victorian Defence Force in January 1864 began a tradition which was to continue and be developed by many hundreds of Reserve Military anaesthetists over the ensuing one hundred and fifty years in Australia. This photograph is from a carte de visite, from the personal photograph album of the Melbourne botanist and scientist, Ferdinand von Mueller, the latter one of Australia’s most decorated scientists. Von Mueller entitled this photograph, the only extant one of Lewelin, “J.H.H. Lewelin, Surgeon Southern Rifles”. Photograph originally taken by Thomas Ferris, commercial photographers of Chapel Street, Prahran, circa 1868. Courtesy of Mrs Doris Sinkora of the National Herbarium of Victoria, with acknowledgements.

Conclusion
One hundred and fifty years after the invention of anaesthesia, the first two Australian National Workshops on Military Anaesthesia was held in Launceston on the 23rd - 24th and the 30th - 31st March, 2000.

Figure 2: The youth face of Australian military anaesthesia. At centre are four anaesthetists-in-training within the Defence Health Service, the Australian Defence Force - students in the second National Workshop of Military Anaesthesia held in Australia: conducted at the Department of Anaesthetics, Launceston General Hospital, Tasmania, 30th - 31st March, 2000. Front row (left to right): Major General John Pearn AM RFD, the Surgeon General, Australian Defence Force; FliLt Tanya Casey; Lt Kate Shea; Wing Commander George Merridew, consultant anaesthetist and National Workshop Co-Convenor and Co-Ordinator. Rear Row: Captain John Stedman RAAMC; Sqn Ldr Tony Keeble. Photograph, Launceston General Hospital, 31st March, 2000.

This city was a most appropriate choice of the Convenor, Wing Commander George Merridew, as it was in Launceston that Dr William Russ Pugh in 1847 conducted the first surgical anaesthesia in Australia. Those one hundred and fifty years have seen an unprecedented evolution in the development of anaesthetic pharmacology, instrumentation, of policies and of safety doctrine. Some things, however, remain unchanged. The pioneer etherists in Australia - Belisario13, Pugh14,15, Buchanan13 and Lewelin7-9 - exhibited those qualities which in colonial times were indispensable for the early development of a new discipline. Those qualities included deft technical dexterity, a flair for improvisation, resilience, courage and a flair for innovation. Such qualities remain the indispensable ingredients of military anaesthesia today just as they did in Lewelin’s time.

Acknowledgements
The author thanks Wing Commander George Merridew of Launceston General Hospital and Squadron Leader Haydn Ferndt of Royal Hobart Hospital; and Dr Alan Macdonald, consultant anaesthetist of Glasgow, for much encouragement.
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Conference Reports

Australian Military Medicine Association - 9th Annual Conference - Hobart 2000

R B Schedlich

The Australian Military Medicine Association held its most successful conference ever at the Hotel Grand Chancellor in Hobart from the 20th to 22nd of October 2000. About 120 delegates attended and were privileged to hear some 30 high quality papers read, and join in a number of extra-Conference activities.

The conference was opened at Anglesea Barracks on the Friday night by His Excellency the Governor of Tasmania, Sir Guy Greene, KCB in a most convivial and historic atmosphere. Earlier in the day, a large group of members took the opportunity to visit the Australian Antarctic Division for a workshop on the medical challenges of cold climate operations.

On Saturday, the conference proceedings in seriousness kicked off with the Qantas Keynote Address given by Captain Bob Mabry, US Army. Bob, who first joined the army as a combat soldier, later became a Special Forces medic and subsequently completed his medical degree. Bob’s paper covered his experiences as a combat medic during the Battle of Mogadishu, covering many of the unique aspects of urban combat medicine. The remaining papers in the Saturday morning session concentrated on operational medicine.

Following the lunch break, an operational Open Forum was held. During this, representatives of the operational arms of Navy and RAAF (Commodore Les Patak, RAN, and Air Commodore John Blackburn, RAAF, respectively) joined the Director General, Defence Health Services, Brigadier Wayne Ramsey (who also had to represent the operational Army as their representative was forced to pull out at the last minute) in discussing how they considered health support to operations should be provided. This forum provoked a lively discussion from the floor. The forum was followed by a varied group of papers covering some historical matters (such as the Boxer Rebellion) and also ethical issues relating to research undertaken on military personnel.

The Association’s Annual General Meeting followed the day’s proceedings. At the AGM, Nader Abou-Seif stepped down as President, to be replaced by Russ Schedlich. Other Councillors were also re-elected. The Treasurer announced a sound financial position, and no requirement to increase membership fees.

The official conference dinner was held on the Saturday night, and was a marvellous affair. In a venue overlooking Constitution Dock, we were treated to some excellent Tasmanian fare, and heard an inspirational talk by our guest speaker, Bern Cuthbertson, renowned adventurer, best know for his recent re-enactment of Bass and Flinders’ explorations in the Norfolk. We were also delighted to here of Air Commodore Short’s impending elevation to the position of Surgeon General, and took the opportunity to informally express our appreciation to General Pearn for his support of the Association during his term as Surgeon General. Trafalgar Night could not be allowed to pass without a toast to the Immortal Memory.

The second full day of the conference started with a keynote address given by Patrick Daghassan, a Swiss pharmacist, who related his experiences in providing humanitarian support in eastern Europe, and discussed many of the issues and problems that arise in such work. Patrick’s paper was followed by two others, which looked at humanitarian support - in Afghanistan and East Timor.

The conference then split into concurrent sessions, with papers being presented on a wide variety of themes, including operational health support, and several original research projects.

At the close of the conference, the Association’s awards and grants were announced (see page 120). Foremost amongst these was the Weary Dunlop Award for the best original paper presented.

1 CAPT Russ Schedlich, RANR is the President of AMMA.
at the Annual Conference. The Award was won by Rob Lewin and Richard Mallet for their paper entitled 'a comparison of 20 metre shuttle run test (20mSRT) scores and time loss due to injury for the first six months of training at ADFA from 1999-2000'.

The conference acknowledged the contribution of Nader Abou-Seif to the Association, and presented him with an Association plaque recognising his service and an autographed copy of Bob Mabry’s book - Blackhawk Down.

This conference was very strongly and generously supported by sponsors, whose contribution allows us to keep costs to a minimum. Our major sponsor, Smith Kline Beecham, continue to be most generous in their support for the Association. Qantas was very generous in providing the funding for our overseas guest speaker. The Association is also grateful for the support of the other conference sponsors - Essex Pharma, Roche Diagnostics, BD, Laerdal, CSL Vaccines, Kimberly-Clark, Medipac, Device Technologies Australia, and Multigate.

Finally, the Association's Secretariat - Paula, Joyce and Amy - hosted us in their home town and put in an enormous amount of hard work without which the Conference would not have been able to take place.

Next Year's Conference
Next year's conference, which will be a celebration of our 10th anniversary, will be held on the Gold Coast, from 19 to 21 October 2001 at the Gold Coast International Hotel.
Society of Military Orthopaedic Surgeons (SOMOS) 42nd Annual Meeting - San Antonio, Texas, USA - 10-15 December 2000

R Atkinson

The Annual Meeting of SOMOS was held in San Antonio, Texas, in mid-December. The first lecture by Michael Bosse, a Gulf War veteran, focused on rethinking orthopaedic trauma priorities, with potential implications for both military planners and orthopaedic surgeons. The use of modern technology in the modern conflict environment and the requirement for very basic Orthopaedic care in the forward area (e.g. plaster casting), were addressed.

The following papers examined the use of arthroscopy in the deployed environment, and its ability to maintain effective troops on a mission, and the forward surgical stabilisation of penetrating lower extremity fractures, with a comparison of circular casting with external fixation. These were not mutually exclusive choices but simplicity was not to be forgotten. The requirement of responsible mission creep in Third World deployments was emphasised, noting that a balance needs to be found and appropriate parameters and guidelines identified.

The afternoon symposium on 'Military Operations Other Than War', including a contribution by LTCOL Steve Rudski, on secondment to the Brooke Army Medical Center, demonstrated the difficulties associated with these missions.

An innovative series of papers on the external fixator pin coating were presented. These noted the effectiveness of chlorhexidine, enhanced by combining with a hydroxyapatite coat, in buying time for an external fixator applied for transport purposes while allowing for further reconstructive surgery, such as intramedullary nailing, being performed at a later date. A paper on a cleanser for petroleum contaminated tissue was presented. This study had been initiated as a result of the release of oil during the Persian Gulf War and its potential contamination of combat wounds.

A segment on the treatment of knee cartilage injuries highlighted the recent work utilising autologising chondrocyte implantation, with a heated debate regarding its efficacy in returning serving members to full duty. The final morning was a cadaveric workshop on anterior cruciate reconstructive surgery.

In summary, the meeting demonstrated a broad range of civilian orthopaedics as well as injuries associated with serving members. Emphasis was placed on war surgery and the meeting reflected the mix of full and part-time Orthopaedic surgeons involved in all the services of the United States, with small contributions from British and Australian presenters.

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2 The SOMOS conference was attended by FLTLT Russell Furze, Orthopaedic registrar, and BRIG Rob Atkinson, Orthopaedic surgeon, from the ADF.
Obituary

Major John Bowen, RAAMC

By Glen Farrow

"It is with great sadness that we must record the passing of Major John Bowen, who died suddenly after recent surgery. John had only recently retired from the regular army after 20 years of service, and was looking forward to a new career and life with his wife Mary.

John was first appointed as a medical undergraduate in January 1978, and completed his medical degree (MB, BS) at the University of Tasmania, including a Bachelor of Medical Science (B Med Sci), in 1984. Early postings included 11 Field Ambulance and RMO 8/9 RAR before being posted as SMO to the Australian Defence Staff in Papua New Guinea in 1986. His duties included those of personal physician to the Australian High Commissioner and his family, and he was promoted to Major.

In July 1990, he was detached to the AATPT Papua New Guinea for a short period. His service in PNG included research into malaria earning him a CGS Commendation. Returning to Australia in 1991, he served in various appointments, including Officer Commanding 3 Camp Hospital and Officer Commanding 6 BASB Medical Company, after taking extended leave in France developing his language and wine appreciation skills. During his extended leave, John lived in Provence, grew a goatee, and travelled around Europe. He became fluent in Pidgin, French, Indonesian and Esperanto and read widely. John was an interesting character, always affable and cheery, but aware that he had foibles. He was genuinely concerned for the welfare of others, and was always very approachable. Along the way he also obtained the Fellowship in the Royal Australian College of General Practitioners (FRACGP).

After a posting as the Assistant Director Medical Services at Defence Centre Melbourne, John was posted to the newly formed Area Health Service - Victoria Central where he became involved in writing medical policies, an aspect of the medical services that he really enjoyed. After completing his twenty years, John decided to move on to a new career as a civilian and outside of medicine. He bought a house in Carnegie which he was busy renovating, and was proud of his gardening skills. One of his proudest moments was when on holiday with Mary recently he tried out on a trapeze and successfully completed a somersault and catch - he thought it was terrific.

That was John, a bon vivant, a caring doctor, a serving officer and a friend to those in need of advice. He is survived by Mary and his children, Rachael and Elliott.

Vale John Bowen."
Submitted by James Ross


This paper describes 5 cases of injury to seabird researchers between 1996 and 1999 at Palmer Station, Antarctica. The injuries were inflicted by three seabird species: the Adelie penguin (Pygoscelis adeliae); the southern giant petrel (Macronectes giganteus) and the brown skua (Catharacta lombergi). All injured parties were biologic researchers with previous field experience working under National Science Foundation research grants; all sought medical evaluation and treatment voluntarily. The nature and frequency of such injuries seems not to have been greatly reported in the medical literature. Although these cases were largely soft tissue injuries that healed without serious complications, the possibility of exotic infections is considered. We have dubbed this constellation of injuries AVES (Antarctic Vogel [German for bird] Encounter Syndrome).

**Comment:** Wilderness and Environmental Medicine is always good for obscure and exotic papers. Unfortunately, this paper seems to have failed in the editing process: despite the authors’ attempt at immortality through the tenuous acronym in the abstract, ‘AVES’ does not rate a mention in the paper itself.


Objective: To determine the incidence of high-altitude cerebral edema (HACE), acute mountain sickness (AMS), and high-altitude pulmonary edema (HAPE) in pilgrims. Although it is well known that western trekkers suffer from AMS in the Himalayas, not much is documented about the incidence of AMS in the local population of Nepal that [sic] go to high altitude.

Methods: The design was a randomised study at a sacred high altitude lake at 4300m at Gosainkunda in the Nepal Himalayas. There was a control study at 1300m at Pashupatinth in Kathmandu, Nepal. The subjects were pilgrims of different ethnic Nepali backgrounds. The Lake Louise consensus for AMS, HACE and HAPE was used, and oxygen saturation with a pulse oximeter was performed on HACE subjects.

Results: Out of 5000 pilgrims, 228 were randomly chosen. 68% had AMS, 31% had HACE and 5% had HAPE. The mean oxygen saturation of HACE subjects at that altitude was 77%, 87% being normal for 4300m altitude. 73% of the study population were men, yet women had a significantly higher rate of AMS (odds ratio 4.34, 95%CI 1.83-10.68), HACE (odds ration 3.15 CI 1.62-6.12), and HAPE (odds ration 5.2, CI 1.24-24.73). Conclusions: Such a high incidence of HACE in an epidemiological study using the Lake Louise criteria has, to our knowledge, not been reported before. High altitude pilgrims, especially women pilgrims in this study, seem to be a very susceptible group. Preventive measures in these pilgrims need to be adopted to avoid AMS, specifically life threatening HAPE and HACE.

**Comment:** Here is a well constructed and original study that sets you thinking. Most of these pilgrims come from a base altitude of 2000m, and ascended to 4300m in two days. The recommendation of daily ascent of no more than 300m above 2800m should apply to anyone, including Nepalese. The confounder is that the pilgrims may be dehydrated: the custom is to fast throughout the pilgrimage, and a measure of dehydration was not made by the researchers. This study showed a much higher odds ratio for women than other studies. The paper speculates that the women may have taken this more seriously than the men, not even drinking water. There is no basis for this idea, however. The dehydration will not result in the decreased oxygen saturation observed, nor will it be improved by use of dexamethasone: all HACE sufferers were given dexamethasone, and did recover.

Background: Several aircraft each year are lost because of an unexplained collision with the ground. The attitude of most of these aircraft prior to impact was nose-low and with excessive bank; ie greater than 90°. Prior to these accidents, each aircraft was noted as either changing heading or making an abrupt roll.

Hypotheses: Could there be some underlying tendency for the pilot to make unnoticed stick inputs after completing a roll from one bank angle to another? Methods: Since ground-based flight simulators cannot create the true sensation of rolling and aircraft from one side to the other, the instrumented CALSPAN NT-33 aircraft was used for this study. Six pilots were given a series of three roll rates and two head positions while the aircraft changed bank from 450° of bank in one direction to 450° of bank in the opposite direction. The subject's view of the external visual scene was restricted with a blue-amber vision restricting transparency combination. All attitude-indicating instruments were blanked, requiring the subjects to make stick inputs based on their vestibular (somatosensory) feedback.

Results: Subjects experienced a consistent tendency to increase bank angle after given control of the aircraft immediately following the roll manoeuvre, while thinking they were maintaining a constant bank angle. In some cases, the pilots rolled the aircraft completely inverted.

Conclusion: When pilots rely on their perception of bank, following a roll, they will inadvertently increase their bank in the direction of the previous roll.

Comment. A useful addition to the possible disorientation / illusions that can lead to Controlled Flight into Terrain. I suspect that there are RAAF accidents that have been contributed to be such an effect in recent times.


The purpose of this paper is to inquire into the relationship between Al Eskan disease and the probable exposure to chemical warfare agents by Persian Gulf War veterans. Al Eskan disease, first reported in 1991, compromises the body's immunological defense and is a result of the pathological properties of extremely fine, dusty sand located in the central and eastern region of the Arabian Peninsula. The disease manifests with localized expression of multisystem disorder, signs and symptoms of Al Eskan disease have been termed by the news media "Persian Gulf Syndrome". The dust becomes a warfare agent when toxic chemicals are microimpregnated into inert particles. The "dirty dust" concept, that toxicity of an agent could be enhanced by absorption into inactive particles, dates from World War I. A growing body of evidence shows that coalition forces have encountered Iraqi chemical warfare in the theater of operation/Persian Gulf War to a much greater extent than early US Department of Defense information had indicated. Veterans of that war were exposed to chemical warfare agents in the form of direct (deliberate) attacks by chemical weapons, such as missiles and mines, and indirect (accidental) contamination from demolished munition production plants and storage areas, or otherwise. We conclude that the microimpregnated sand particles in the theater of operations/Persian Gulf War depleted the immune system and simultaneously acted as vehicles for low-intensity exposure to chemical warfare agents and had a modifying-intensifying effect on the toxicity of exposed individuals. We recommend recognition of a new term, “dirty sand”, as a subcategory of dirty dust/dirty chemical warfare agents. Our ongoing research efforts to investigate the health impact of chemical warfare exposure among Persian Gulf War veterans suggests that Al Eskan disease is a plausible and preeminent explanation for the preponderance of Persian Gulf War illnesses.

Comment: A lengthy and ultimately unconvincing article. The Journal Military Medicine it seems is deliberately seeking controversy, as this concept can best be described as fringe. The is nowhere evidence that there was actually CW agents in the fine sand, that agents remain for long periods under such conditions, that such chemicals could be biologically active, that there were methods to distribute such agents in such a way to ensure there were no significant collections and that they could be distributed widely enough to cause illness in such disparate groups, and that there was no-one exposed to sufficiently high amounts to produce acute symptoms. There appears to be no correlation to exposure to sand during
he Gulf War and to other US or allied exposures before and after the Gulf War. If it were fine sand causing multisystem disease, then it should be present in many others. Drawing a very long bow, the authors suggest Al Eskan disease was the cause of the illness in Lawrence of Arabia. The picture of Gulf War Syndrome simply does not fit the scenario being described in this article. I find it very unsatisfactory that such a very intellectually suspect paper finds its way into the premier English language Military Medicine journal. 'Al Eskan disease is a plausible and preeminent explanation for the preponderance of Persian Gulf War illnesses' say the authors: NOT!


Our purpose in this investigation was to develop and validate a theoretical model for a backpack run test based on how fast one can run 2 miles while wearing a backpack. Using actual unloaded (no backpack) 2-mile-run test data from 59 males service academy cadets, we calculated the average oxygen cost during the run, the equivalent cost if wearing additional weight, and the corresponding estimated run time with the backpack. The correlations between body weight and loaded (backpack weight = 30 kg) run times ($r = 0.55 \ p< 0.05$ and $r = 0.12 \ p<0.05$), respectively demonstrate that the bias against heavier runners is eliminated with the backpack run. Given that the backpack run test requires only standard issue equipment, demonstrates clear occupational and health related fitness relevance, predicts no apparent body-size bias, and measures work-and-health-related components of fitness, we recommend that the military services consider the present data when developing or modifying tests of physical fitness.

Comment. Maybe I have picked flawed papers deliberately so I can appear tough and incisive. Anyway, this paper fails to consider the effects of injuries inflicted in personnel training or and conducting such a test, and the actual relevance to what personnel will be doing in the field. How many times will people have to run 2 miles with a 30kg pack (funny about how the imperial and metric measurements are interwoven) while deployed? Save us from such stupidity.


Many studies of civilian populations have found a significant relationship between smoking and weight gain. However the effect of voluntary smoking cessation on weight for military personnel has not been studied. The present study evaluated 70 active duty military members (55 males and 15 females) who quit smoking after participating in an 8-week smoking cessation program. The results indicated that 88% of the participants gained weight and that the average weight gain was 6.6 lb (males 5.5 lb, females 9.8 lb). Theses results are particularly noteworthy because weight gain in military members may result in administrative actions for individuals exceeding weight standards. The authors recommend that military officials consider adopting a one-time temporary weight waiver for active duty military members who successfully quit smoking to help prevent any negative administrative consequences of post-cessation weight gain.

**Comment:** So further proof that military members are only human after all. Waivers are dangerous things, and can often turn into semi-permanent and permanent features for an individual. Uncomplicated overweight in and of itself is an administrative issue, not a medical one, while the reverse is true of smoking. As is noted in the study, weight gain in civilians is maintained over time. The overhang of administrative action may result in the reduction of weight gain or a return to pre-cessation weight in military personnel.


Background: To determine which, if any, characteristics should be incorporated into a select-in approach to screening personnel for long duration spaceflight, we examined the influence of crewmember social-demographic characteristics, personality traits, interpersonal needs, and characteristics of station physical environments on performance measures in 657 American men who spent an austral winter in Antarctica between 1963 and 1974.

**Method:** During screening, subjects completed a Personal History Questionnaire which obtained information on social and demographic characteristics, the Deep Freez opinion Survey which assessed 5 different personality traits, and the Fundamental Interpersonal relations
Orientation-Behaviour (FIBO-B) Scale which measured 6 dimensions of interpersonal needs. Station environment included measures of crew size and severity of physical environment. Performance was assessed on the basis of combined peer-supervisor evaluations of overall performance, peer nominations of fellow crewmembers who made ideal winter-over candidates, and self-reported depressive symptoms.

Results: Social/ demographic characteristics, personality traits, interpersonal needs, and characteristics of station environment collectively accounted for 9-17% of the variance in performance measures. The following characteristics were significant independent predictors of more than one performance measure: military service, low levels of neuroticism, extraversion and conscientiousness, and a low desire for affection from others. Conclusions: these results represent an important first step in the development of select-in criteria for personnel on long duration missions in space and other extreme environments. These criteria must take into consideration the characteristics of the environment and the limitations they place on meeting needs for interpersonal relations and task performance, as well as the characteristics of the individuals and groups who live and work in these environments.

Comment: Archived material, over 25 years old, was used in this study. There may be so much more raw data out there just waiting to be analysed. This data shows that the characteristics associated with performance are of themselves of minor importance. A total of about 10% of the variance. Hardly enough to justify selecting preferentially those with such characteristics. However, the researchers state 'combined with evidence of conservation of resources and salutogenic models of behaviour, these results suggest that personality characteristics and interpersonal needs are context-specific predictors of behaviour and performance in extreme environments.'


Previous psychophysical studies of hypoxia's effects on auditory sensitivity have provided mixed results but the weight of evidence supports the conclusion that sensitivity is unaffected by hypoxia. This conclusion is discrepant with that drawn from physiological studies in which hypoxia has been found to affect auditory-evoked response (AER) latency. One possible explanation of this discrepancy concerns the relatively low maximum frequency (8 kHz) for which hypoxia's effects were assessed in the psychophysiological studies. We have extended the range of frequencies up to 16 kHz. Thresholds for 1-, 8-, 10-, 12-, 14- and 16-kHz tones were measured at levels of hypoxia equivalent to altitudes of 0, 1200, 2400 and 3700 m. Our results indicate that sensitivity for frequencies up to 16 kHz is unaffected by hypoxia. We suggest that AER latency does not provide a valid measure of auditory sensitivity.

Comment: A definitive study from the RAAF Institute of Aviation Medicine which demonstrates the lack of an effect on auditory sensitivity by hypoxia up to 3700 m. However, it does not attempt to speculate as to why there is no effect.

Submitted by Andy Robertson


Background: Domestic and international acts of terrorism using chemicals and pathogens as weapons have recently attracted much attention because of several hoaxes and real incidents. Clinical laboratories, especially those affiliated with major trauma centers, should be prepared to respond rapidly by providing diagnostic tests for the detection and identification of specific agents, so that specific therapy and victim management can be initiated in a timely manner. As first-line responders, clinical laboratory personnel should become familiar with the various chemical or biological agents and be active participants in their local defense programs.

Approach: We review the selected agents previously considered or used in chemical and biological warfare, outline their poisonous and pathogenic effects, describe techniques used in their identification, address some of the logistical and technical difficulties in maintaining such tests in clinical laboratories, and comment on some of the analytical issues, such as specimen handling and personal protective equipment.

Content: The chemical agents discussed include nerve, blistering, and pulmonary agents and cyanides. Biological agents, including anthrax and smallpox, are also discussed as examples for organisms with potential use in bioterrorism. Available
therapies for each agent are outlined to assist clinical laboratory personnel in making intelligent decisions regarding implementation of diagnostic tests as a part of a comprehensive defense program. Summary: As the civilian medical community prepares for biological and chemical terrorist attacks, improvement in the capabilities of clinical laboratories is essential in supporting counterterrorism programs designed to respond to such attacks. Accurate assessment of resources in clinical laboratories is important because it will provide local authorities with an alternative resource for immediate diagnostic analysis. It is, therefore, recommended that clinical laboratories identify their current resources and the extent of support they provide, and inform the authorities of their state of readiness.

Between April 1997 and June 1999, some 200 mailed or telephoned bioterrorism threats were received at a variety of locations. Usually claiming that anthrax had been released, the threats all proved to be hoaxes. In many instances, local emergency responders treated more than 13,000 potential victims inappropriately, in particular requiring victims to strip and undergo decontamination with bleach solutions. Narratives of several incidents indicated that many victims were distressed and embarrassed by their treatment. Their experiences underscore the need for improved local response actions and the formulation of a uniform response protocol for public health agencies.

The intentional dispersal of biological agents by terrorists is a potential problem that increasingly concerns the intelligence, law enforcement, medical, and public health communities. Terrorists might choose biological agents over conventional and chemical weapons for multiple reasons, although it is difficult to predict, with certainty, which biological agents might prove attractive to terrorists. One can more confidently, however, derive a list of those few agents which, if used, would be of greatest public health consequence. It is these agents which will require the most robust countermeasures. We discuss the derivation of this short list of agents and the specific diseases involved.
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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 or SQNLDR Karen Gisler on (02) 6266-2314 or e-mailed to: agrobert@excite.com or kgisler@cyberone.com.au

Defence Force Promotions

The following AMMA members have been promoted in the Defence Forces:
CMDR Andy Robertson to A/CAAPT

Defence Force Movements

COL Hutton has posted to HQAST
COL Neale Burton to SHO AHS-SA
LTCOL Dave Sweeney, the JO7 HQ Norcom, is posted to East Timor.
CMDR Neil Westphalen has posted to HMAS STIRLING.
CMDR Carmel Moore has posted to HMAS CERBERUS.
SQNLDR Mike Seath is posted to AVMED.
SQNLDR Karen Gisler is posted to Townsville.

2001 Conference

The 10th AMMA Scientific Conference will be held on the Gold Coast from the 19-21 October 2001 at the Gold Coast International Hotel.

AMMA Homepage

AMMA has a home page at: http://amma.trump.net.au/
The website is constantly evolving, any contributions are welcome.

AMMA Contacts

For all general AMMA inquiries contact the Secretariat:
Leishman & Associates on
Tel: (03) 6234 7844
Fax: (03) 6234 5958
Email: amma@leishman-associates.com.au

Journal

Journals for 2001 will be published as follows:
Issue Copy Deadline
Apr 2001 31 March
Aug 2001 31 June
Dec 2001 31 October

All queries regarding the Journal should be directed to:
Andy Robertson
Tel: (02) 6266 4483
0410 626 829
Fax: (02) 6266 2314

Awards & Grants

AMMA have a number of Awards and Grants available to members. Deadline for all Awards is 30 June 2001.

For those wishing to do a research project within defence, the project must be approved by ADMEC (The Australian Defence Medical Ethics Committee). Information kits for new researchers are available from the ADMEC Executive Secretary
Tel (02) 62663818
Fax (02) 62664982

Journal Editors Prize - $750
For best paper by an AMMA Member published each year in the AMMA Journal.

Research Grant - $1000
A grant presented towards new or ongoing research.

Patron's Prize - $250
Best article published in a peer-reviewed journal by an AMMA member – must be a health related article.

Australian Military Medicine Prize - $500
Best essay by AMMA member on a chosen topic. The topic for 2001 is "The future role of IT in military health".

For further information contact AMMA Secretariat, via email or the web.
AMMA ON THE NET

Conferences:
Medical Conferences

Journals:
Medical Journal of Australia
New Scientist

Military Medicine:
AMSUS
Armed Forces Infectious Diseases Society
Armed Forces Radiobiology Research Institute
Association of Military Osteopathic Physicians and Surgeons

Finnish Museum of Military Medicine
Henry Jackson Foundation for the Advancement of Military Medicine
International Association of Military Flight Surgeon Pilots

Professional Colleges:
ANZCA
RACGP
RACMA
RACP
RACS

http://www.pslgroup.com/medconf.htm
http://www.newscientist.com/
http://www.amsus.org/
http://www.usuhs.mil/afrri/index.html
http://www.amops.org/
http://www.travel.fit/int/mmm/
http://scoop.hij.org/
http://www.geocities.com/Pentagon/2265
http://www.anzca.edu.au/
http://www.racgp.org.au/
http://www.racma.org.au
http://www.rACP.edu.au/
http://www.racs.edu.au/

Conference and Meeting Calendar

<table>
<thead>
<tr>
<th>Date</th>
<th>Conference</th>
<th>Venue</th>
<th>Contact No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–4 March 01</td>
<td>Trauma 2001</td>
<td>Sydney</td>
<td>02 9956 8333</td>
</tr>
<tr>
<td>2–3 April 01</td>
<td>Communicable Diseases 2001</td>
<td>Canberra</td>
<td>02 6251 0675</td>
</tr>
<tr>
<td>13–16 May 01</td>
<td>RACP Conference</td>
<td>Sydney</td>
<td><a href="http://www.racp.edu.au/asm">www.racp.edu.au/asm</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>03 9819 3700</td>
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<tr>
<td>25–27 May 01</td>
<td>Controversies in Civilian and Military Trauma 2001</td>
<td>Brisbane</td>
<td>07 3395 6883</td>
</tr>
<tr>
<td>26 May–2 Jun 01</td>
<td>SPUMS Meeting</td>
<td>Madang, PNG</td>
<td>03 9885 8863</td>
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<tr>
<td>18–29 Jun 01</td>
<td>ADF Medical Officers NBC Course</td>
<td>SME, Sydney</td>
<td>02 6266 4483</td>
</tr>
<tr>
<td>4–8 Jul 01</td>
<td>Wilderness Medicine</td>
<td>Keystone CO USA</td>
<td><a href="mailto:Ocmee@uscd.edu">Ocmee@uscd.edu</a></td>
</tr>
<tr>
<td>25–29 Aug 01</td>
<td>Orphan Vaccines Conference</td>
<td>Palm Cove</td>
<td>03 8344 5712</td>
</tr>
<tr>
<td>19–21 Oct 01</td>
<td>10th AMMA Conference</td>
<td>Gold Coast</td>
<td>03 6234 7844</td>
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</tbody>
</table>
CONTRIBUTIONS

for the April issue should be sent to:

The Editor
Australian Military Medicine
16 Gaylard Place
GORDON ACT 2906
andyandlaura@bigpond.com

Deadline is 30 March 2001

Instructions for Authors:

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

- two hard copies should be submitted, typed double-spaced on A4 paper (single-side)
- if possible, an electronic copy on an IBM formatted 3.5 inch floppy disc in a standard word processing programme should be submitted
- 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:
- 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.
# Australian Military Medicine

Volume 9 Number 3  
December 2000

**ISSN 1443-7058**

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**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.
Australian Military Medicine Association

August 2000

Patron
Major General J. Pearn
Surgeon General Australian Defence Force

President
Nader Abou-Seif

Vice-President
Russell Schedlich

Council
Secretary
Fabian Purcell
Treasurer
Graham Boothby
Public Officer
David Emonson
Journal Editor
Andrew Robertson
Member
Janet Scott
Member
Beverley Wright

Secretariat
Leishman & Associates

On behalf of Council, I am pleased to present the annual report of the Australian Military Medicine Association together with the Balance Sheet and related Accounts for the year ended 30 June 2000.

Nader Abou-Seif

President's Report

I am pleased to report that a number of initiatives developed over the last one to two years have started to provide beneficial results. The overall position of the association is sound and I feel that the association can look forward to the coming year with confidence.

Membership. After the review of our membership list in the previous 12 months, this last year has seen a steady growth in our membership. The number of financial members has grown and our contact list is more reliable than for a number of years.

Financial Issues. This last year has seen the completion of the change in our financial year from a calendar year to a financial year basis. We have seen a turnaround in our balance sheet from the loss of the previous two years that was partly due to this change of AMMA financial year to a surplus. This should allow us to continue to support research in Military Medicine and assist with other educational activities. The last few months have also seen AMMA prepare to deal with the introduction of the GST and I am pleased to report that the implementation of statutory requirements has gone smoothly.

Journal. Three issues of the journal have been produced in the last twelve months. The format has changed to allow a more comprehensive journal. Andy Robertson has done an outstanding job in his first year as editor. In my President's Messages, I have encouraged our membership to participate in making the journal a better publication. There is a vast repository of knowledge in our membership and your continued support will ensure the continued high standard of our journal. It is planned to maintain a production schedule of three journals a year at this time and every attempt will be made to ensure prompt production and distribution.

Technology. The last twelve months has seen a greater use of the AMMA website for both dissemination of information and as an interface to contact the association. A number of memberships and Conference registrations have taken place through our site at http://amma.trump.net.au.
Research. This has been the first year of our new Research Grant Program that allows for a greater number of awards to be issued in a number of categories. As discussed in the journal the award of prizes was widened to include a prize for the best journal article, to the best article in a peer review journal by an AMMA member and the best article on a military medicine related subject to be announced at the Annual National Meeting in October. The Research Grant would also continue with its present guidelines but in a reduced amount. AMMA maintains a commitment to encouraging research and original contributions in all fields of Military Medicine. At last years National Conference, the Weary Dunlop Award was awarded to Rosalind Hearder and the Research Grant to Ian Caterson.

Liaison. Council have been in contact with the Aviation Medicine Society of Australia and New Zealand with the aim of arranging a co-located or joint meeting. Unfortunately a proposal to proceed with a meeting together next year was not able come to fruition. Council remains committed to pursuing a future joint meeting with AMSANZ. Preparation for liaison with the professional colleges has been undertaken, and it is to be hoped that this will enlarge our membership base and also help to provide a further focus for those with an interest in military medicine in the wider health community.

Council. As in previous years, Council continue to meet four times per year, twice in person - once at the National Conference - and twice via teleconference. In addition the members of Council are in frequent contact throughout the year to discuss issues as they arise. Again, I would like to thank all members of Council for their efforts and support throughout the year. The efforts of the council members are important to the smooth and efficient performance of the association. I would like to thank all those who have served on council during my time as President for their help, support and vision for the future of AMMA.

Our year, therefore, has again been one of steady progress and solid rather spectacular growth. We are still a young organisation and the support of an enthusiastic membership remains vital for the future growth and development of the association.

AMMA remains an independent organisation that I hope will remain a focus for all those with an interest in Military Medicine. Your active participation and contribution in AMMA’s activities remain an essential component in our continued growth and strength. In this way our ability to provide for and represent the interests of our membership will be guaranteed. With your support, we can have just cause for confidence as we look forward into the future. Once again, I thank you for your support during my presidency.

Nader Abou-seif
President

Treasurer’s Report

I present the attached audited Income and Expenditure Statement and Balance Sheet for the financial year ending 30 June 2000.

The following highlights should be noted:

- A rise in income for the year of $18,475
- Containment of costs rise for the year of $449
- A resultant significant turnaround in the operating surplus from a $5,000 deficit to a nearly $13,000 surplus.

The membership income rise was largely due to a clean up of membership register and follow up of fee defaulters and timing of the payments relative to financial year end. This last year included many payments for the previous year memberships.

The $10,000 donation is from our major sponsor SmithKline Beecham.

In the expenses, successive treasurers have used various names for council meetings. They have been variously categorised as council meetings, committee meetings and ‘face to face’ meetings to differentiate from teleconference meetings. I have attempted to clean this up and in future will only refer to council meeting costs.

A major rise in bank fees has been avoided by increasing the use of the largely fee free Australian Defence Credit Union account.

There has been a rise in secretariat costs and is associated with the increasing complexity of running the organisation. Preparation for the GST, maintenance of the web site, responding to e-mails,
assistance with the journal and mailings and general membership administration and finally, keeping the council well organised are the main activities of the secretariat.

There are no major budgetary changes forecast for the next financial year and no change to the membership fee is recommended.

Graham Boothby
Treasurer

Secretariat

Total membership of AMMA as at 16/10/00 stands at 361.

The Association welcomed 34 new members in the last financial year. Ten resignations were received from 1/7/99 to 30/6/00.

Membership breakdown is: ACT 30, NSW 102, NT 6, QLD 44, SA 43, TAS 13, VIC 89, WA 19, USA 6, UK 2, NZ 2, PNG 1, ITALY 1, GERMANY 1, SAUDI ARABIA 1 and unknown 1.

Journal

*Australian Military Medicine*, the official journal of the Association, was published three times since the last Conference:

<table>
<thead>
<tr>
<th>Month</th>
<th>Volume</th>
<th>Issue</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1999</td>
<td>Vol 8 No 3</td>
<td></td>
<td>40 pages</td>
</tr>
<tr>
<td>April 2000</td>
<td>Vol 9 No 1</td>
<td></td>
<td>56 pages</td>
</tr>
<tr>
<td>August 2000</td>
<td>Vol 9 No 2</td>
<td></td>
<td>60 pages</td>
</tr>
</tbody>
</table>

A total of twenty-five articles were published representing original scientific works, scientific reviews and historical pieces, with additional material in the form of editorials, abstracts, information pieces and a variety of AMMA news and information. Given the wealth of articles in the Military Medical community, a deliberate decision has been taken to expand the Journal. This expansion is initially to 60 pages and then steadily beyond that as articles allow.

The format of the journal has now stabilised into one that is compact and easy to read. The “AMMA Update” has become a regular feature, providing information on the Association and its members in a consistent format and location. The Assistant Editor, Karen Gisler, compiles this from information from a variety of sources.

More contributions from members in the form of articles and small items are, as always, welcome.

Andy Robertson
Editor

1999 Conference

The 8th Annual Scientific Conference of the Australian Military Medicine Association was held at the Stamford Plaza Hotel, Adelaide, from the 8th to the 10th of October 1999. Over 90 delegates from both the Permanent and Reserve Defence Forces, as well as civilians with an interest in military medicine, were treated to a range of scientific and topical papers during the three days of proceedings.

Official Opening

More than 60 AMMA delegates attended a cocktail reception held at Government House. The Governor of South Australia, His Excellency, Sir Eric Neal officially opened the conference and then treated his guests to a grand, yet relaxed evening including a tour of Government House.

Social Programme

The Conference Dinner was held on the Saturday night in the Bradman Room at Adelaide Oval. A fun night was had by all with a Quiz Night successfully run by the one and only Quiz Master Russ Schedlich.
Conference themes:
The End of the 1900s: Yesterday, Today and Tomorrow
• History of Australian Military Medicine
• Prevention – Better than Cure?
• Provision of Health Care in War and Peace
• Weapons of Modern Warfare
• The Aftermath
• Towards the Future

Keynote Speaker
Dr Mike Hill from the NSW Department of Health spoke on Civilian approaches to CBR Defence.

‘Weary’ Dunlop Award
The ‘Weary’ Dunlop Award is presented annually for the paper judged the best original work at the AMMA Scientific Conference. The 1999 award was presented to Miss Rosalind Hearder for her paper titled “Careers in Captivity: Australian POW Medical Officers in WWII”.

Sponsorship and Trade Display
The AMMA received support from the following sponsors.

Major Sponsor
• SMITH KLINE BEECHAM

Exhibitors
• GMS MARKETING
• SANOFI-SYNTHELABO
• LAERDAL PTY LTD
• ROCHE DIAGNOSTICS
• ESSEX PHARMA
• DRAGER
• MULTIGATE
• UVEX SAFETY

AMMA Incentive Schemes
For a number of years now the Australian Military Medicine Association (AMMA) has offered research grants totalling $2,500 annually as an incentive to Association members to engage in research in military medicine and to contribute to the body of scientific literature pertaining to the area. While there have been a number of excellent pieces of work produced under the sponsorship of the Association, the number of research proposals received by the committee for consideration for the grant has been very small.

With this situation in mind, the AMMA Council reviewed the research grant program and agreed that it should be revised and more broadly targeted. As such, from 1 July 1999, AMMA will offer three prizes to members for original scientific literature on military medicine related topics in addition to offering a research grant (under the current rules but for a reduced stipend). The three prizes to be offered are:

• The AMMA Journal Editor’s Prize ($750). This will be awarded for the best original paper published in the AMMA journal in a financial year. The journal editor will be the sole judge and has the right to not award a prize in the event that articles do not meet an adequate standard.

• The AMMA Patron’s Prize ($250). This will be awarded for the best original paper on a military medicine related topic written by an AMMA member and published in a peer reviewed journal in a financial year. The Surgeon General of the ADF will judge all papers submitted to the AMMA secretary for consideration for this prize by 1 August immediately following the financial year in question.
• The Australian Military Medicine Prize ($500). This will be awarded for an essay written by an AMMA member on a health-related subject to be announced at the annual AMMA scientific meeting each year. Essays for consideration for the prize must be submitted to the AMMA secretary by the end of the financial year. The AMMA Council will judge them. No Council member may enter an essay into this competition.

• The AMMA Research Grant. This will continue under its current rules. However, the amount of the stipend for this grant will be reduced from $2500 to $1000 to be offered annually. The adjudication of the judge’s of each prize will be final and no appeal or correspondence questioning such decisions will be entertained. Further information on these prizes and grants is available through members of the AMMA Council.

### Summary of AMMA Awards

<table>
<thead>
<tr>
<th>Award</th>
<th>Amount</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMA Journal Editor’s Prize</td>
<td>$750</td>
<td>Best paper by an AMMA member published each year in the AMMA Journal. Judged by AMMA Journal Editor</td>
</tr>
<tr>
<td>Research Grant</td>
<td>$1,000</td>
<td>To remain in current form. Judged by Council</td>
</tr>
<tr>
<td>AMMA Patron’s Prize</td>
<td>$250</td>
<td>Best article published in a peer-reviewed journal by an AMMA member – must be a health-related article. Judged by AMMA Patron (Open to Council Members)</td>
</tr>
<tr>
<td>Australian Military Medicine Prize</td>
<td>$500</td>
<td>Best essay by AMMA member on topic, which will be announced at the annual scientific meeting/conference. Judged by AMMA Council. (Not open to Council members)</td>
</tr>
</tbody>
</table>

**Deadline: 30 June**
For published articles, publication will be in a specified year. Copies of articles published in other journals must be forwarded to Council to be considered.

---

**“Weary” Dunlop Award**

The “Weary” Dunlop award of $500 is given annually for the best paper presented at the Annual Conference.

At the 1999 Conference, Rosalind Hearder received the award, for her paper: Careers in Captivity: Australian POW Medical Officers in WWII

**Research Grant**

Each year, the Association awards one or more Research Grants to a total value of $1,000 to assist members in undertaking research in the field of military medicine.

In 1999, Council awarded the Grant to: Ian Caterson.
Library

The Association’s Library is physically located at Maritime Headquarters in Sydney. Loans are available for periods of up to 12 weeks by contacting the Librarian on 0409 775 109.

AMMA on the Net

AMMA’s Web Page contains information about the Association, its office bearers and activities, and includes links to other military medical organisations and associations. The page is located at: http://amma.trump.net.au/

Financial Statements

Financial statements and balance sheet were presented to the Annual General Meeting in Hobart.

New Members

During 1/7/99 –30/6/00, AMMA welcomed the following new members

Francis ALCANTARA
Anthony ANKER
Lynette BANNER
Alex BORDEJENKO
Jay CLEMENS
Orazio CUSANC
Sharon DANIELS
Adrian ESTERMAN
Nick FORD
Karen GISLER
Peter GRAY
Jackson HARDING
Jo HARDING
Michael HILLS
James HOLLAND
Adam KESTEL
Douglas KING
Suzanne LARGO S
Peter LEGGAT
Geoffrey MATTHEWS
Gerard MEIJER
Gordon MORRISON
Michael O’CONNOR
Christopher QUE HEE
Jay RANDHAWA
Michael READE
Thomas SMITH
Jim TAYLOR
Peter THOMAS
Timothy WAGNER
Patrick WEINRAUCH
Brian WHITE
Alan WRIGHT
Ian YOUNG
### Income & Expenditure Statement

For the year ended 30 June, 2000

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<td>Merchandise Sale</td>
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<tr>
<td>Conference Registrations</td>
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<td>34,525.00</td>
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<td>Conference Exhibitions</td>
<td>24,772.50</td>
<td>21,000.00</td>
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<tr>
<td>Donations Received</td>
<td>10,000.00</td>
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<td>Interest received</td>
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<td>170.82</td>
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<td>Other income</td>
<td>150.00</td>
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<tr>
<td><strong>Total income</strong></td>
<td>88,019.52</td>
<td>69,544.82</td>
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<table>
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<tr>
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<th>2000</th>
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<tr>
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<td>395.00</td>
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<tr>
<td>Annual Conf - Secretarial</td>
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<td>12,263.20</td>
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<tr>
<td>Annual Conf - Other</td>
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<td>44,764.89</td>
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<tr>
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<td>Bank fees and charges</td>
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<td>Committee Meetings</td>
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<td>277.00</td>
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<td>Face To Face</td>
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<td>25.50</td>
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<tr>
<td>Interest</td>
<td>-</td>
<td>1.55</td>
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<tr>
<td>Journals</td>
<td>2,793.57</td>
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<tr>
<td>Miscellaneous</td>
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<td>Postage, Telephone &amp; Stationery</td>
<td>3,044.69</td>
<td>2,502.10</td>
</tr>
<tr>
<td>Secretarial Exp - Journals</td>
<td>152.61</td>
<td>528.40</td>
</tr>
<tr>
<td>Secretarial Exp - Other</td>
<td>9,440.96</td>
<td>5,886.40</td>
</tr>
<tr>
<td>Seminars</td>
<td>-</td>
<td>295.00</td>
</tr>
<tr>
<td>Stock Adjustments/write Offs</td>
<td>4,081.00</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total expenses</strong></td>
<td>75,171.07</td>
<td>74,722.02</td>
</tr>
</tbody>
</table>

**Operating surplus**  
12,848.45  
(5,177.20)

**Accumulated surplus at the beginning of the financial year**  
25,054.68  
30,232.88

**Accumulated surplus at the end of the financial year**  
27,903.13  
25,054.68

These statements should be read in conjunction with the attached auditors report.
## Balance Sheet

**As at 30 June, 2000**

### Current Assets

<table>
<thead>
<tr>
<th>Description</th>
<th>2000</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Aust Defence Credit Union Acc.</td>
<td>4,437.38</td>
<td>38.99</td>
</tr>
<tr>
<td>National Aust Bank Cheque Acc.</td>
<td>22,414.80</td>
<td>4,420.20</td>
</tr>
<tr>
<td>NAB Conference Acc.</td>
<td>6,349.40</td>
<td>812.94</td>
</tr>
<tr>
<td>Term Deposit - ADCU</td>
<td>—</td>
<td>11,000.00</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>33,201.58</td>
<td>16,272.13</td>
</tr>
</tbody>
</table>

### Non-Current Assets

<table>
<thead>
<tr>
<th>Description</th>
<th>2000</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Plant and Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library At Cost</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Merchandise At Valuation</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td><strong>Total non-current assets</strong></td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td><strong>Net Assets</strong></td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td><strong>Members' Funds</strong></td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Accumulated surplus (deficit)</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td><strong>Total Members' Funds</strong></td>
<td>£</td>
<td>£</td>
</tr>
</tbody>
</table>

### Notes

These statements should be read in conjunction with the attached auditors report.
I have audited the attached financial statements of the Australian Military Medicine Association Inc. for the year ended 30th June 2000. The Club’s Committee is responsible for the preparation and presentation of the financial statements and the information they contain. I have conducted an independent audit of the financial statements in order to express an opinion on them to the members of the Association.

The financial statements record all the income and expenditure recorded in the books of the Association but whilst I have no reason to believe that there has been any unrecorded income I am not able to confirm this.

In my opinion, subject to the above, the Association has kept proper accounting records and other books during the year and the attached financial statements present fairly the position of the Association as at 30th June 2000 and the result of its operations for the year.

Dated this 20th day of September 2000.

ADRIAN VAN DONGEN
AUDITOR