



- Soldiers service performance and physical training
- Experiences of a prisoner-of-war
- Post Traumatic Stress Disorder





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Cover Photo: Maker Unknown 'The Baily Flag' 1914, wool bunting, cotton, cellulose 148x156cm. Purchased with the assistance of the Department of Veterans Affairs. Collection: Tasmanian Museum and Art Gallery

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STATEMENT OF OBJECTIVES

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

- Promoting the study of military medicine
- Bringing together those with an interest in military medicine
- Disseminating knowledge of military medicine
- Publishing and distributing a journal in military medicine
- Promoting research in military medicine

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

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Inside this Edition

Billy Bacon couldn't outrun the German machine gun bullets, although his actions saved the lives of two of his fellow diggers. I have just returned from seeing 'Beneath Hill 60', which details the story of the 1st Australian Tunnelling Division and the mining of the Messine Ridge in Belgium in 1916. This excellent Australian movie captures some of the feel of the trench warfare of 95 years ago and highlights the real challenges of the stretcher bearers, corpsman and medical officers in providing medical care. While Billy Bacon still probably would not have survived, many others would have been more fortunate with the medical care of today. Capturing the histories of how health care is provided in all the conflicts over the last 100 years remains important, particularly if we are to continue to refine and improve modern military health care, and I would encourage any of our authors who may be considering documenting such histories to consider publishing them in this Journal.

I have recently resumed the role of Editor, having edited the predecessor Journal, *Australian Military Medicine*, for a number of years. I have taken over from Dr Russ Schedlich, who has done a wonderful job in growing the Journal to cover both military and veterans' health, and am thankful for the excellent foundation he has laid. So who am I? Many, particularly the older ones, will know me. I am a Captain in the Royal Australian Navy Reserve, having served 23 years in the RAN from 1979 to 2003, before taking up a role as the Director, Disaster Management for the Department of Health in Western Australia. I am Public Health Physician and specialist Medical Administrator by training, with a background in disaster medicine and chemical, biological, radiological and nuclear defence. I have held various editorial positions and still sit on various editorial boards for journals as diverse as *Australian Health Review*, *Military Medicine and Emerging Health Threats*.

Our April 2010 issue covers a diverse range of topics across the military medicine and veterans' health spectrum. Two original research articles look at different aspects of the preparation of deploying troops, through vaccination and physical training. Our review article looks at air travel and pregnancy and the issues that may arise. From the Front, we have a paper on Post-Traumatic Stress Disorder (PTSD) and military service. This article is not designed to be a definitive piece on PTSD, but rather a personal view on the ongoing challenges of managing PTSD from diagnosis to discharge and beyond. Finally, in our reprinted article section, we have a historical article on life in bomber command and the German prisoner-of-war camps of over 65 years ago. All the articles are intended to challenge, educate and broaden the operational and strategic viewpoint of our members. We would particularly welcome continuing discussion on the issues of current military operations, current military and veterans health issues, military health history and military-civil interactions. We also appreciate our regular authors and would encourage others to write on their areas of military or veteran's health interest.

Dr Andy Robertson
Editor

President's message

2010 is a third over and the Defence Health Symposium in Canberra from the 29th to 31st October draws ever closer. The organising committee, under the watchful eye of Dr Nader Abou-Seif and Joint Health Command, is busily organising programs, calling for papers and, inviting plenary speakers to make this symposium, a not to be missed event. Members are reminded that the call for papers closing date is the 4th June and the organising committee is particularly keen on papers from across the broad spectrum of health. I look forward to seeing you there.

As this is the ANZAC edition of *Journal of Military and Veterans' Health* it perhaps a poignant time to reflect on the health personnel who have or are serving our country. Recently, I attended the ANZAC ceremony at the University of Queensland's Medical School and, looking at the names on the memorial plaque, I was stuck by their unselfishness and devotion to

duty. Squadron Leader Paul McCarthy's mother was in attendance too, and her presence drove home the grief their sacrifice imposes on the family and friends. Paul and 8 others lost their lives in a tragic helicopter crash on Nias Island. Readers may also be aware of the finding of the hospital ship, *AHS Centaur*, off the southern Queensland coast where all but 64 perished on the 13th May 1943. We owe these and so many others a debt of gratitude.

Lest we forget.

Greg Mahoney
President



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The Baily Flag

As pictured on the front cover – it is housed at the Tasmanian Museum and Art Gallery (TMAG) as part of their Treasures collection. It was purchased by TMAG in 2001 with assistance from the Department of Veterans Affairs after the then Tasmanian State Premier, Jim Bacon, recognised it as a significant war artefact.

The story of the flag and its owner Harry (Bill) Baily is an amazing one and we are grateful to TMAG and the family of Harry Baily to be able to tell it to you.

The Baily Flag

On 14 September 1915, Tasmania's Seventh Field Ambulance C Section relieved the New Zealanders who were in charge of the dressing station under Hill 971, to the left of the Australian position at Gallipoli's Chailak Dere. The worst of the fighting was finished, the British having nearly conceded defeat. Even so, although a Red Cross flag flew over the station, it was often a target for shrapnel, explosives, and stray bullets. This persistent danger led the commanding officers to order the move to Mule Gully on 14 November.

One member of C Section was Harry (Bill) Baily, a young mechanic from Huonville, Tasmania. Just before the move, a piece of shrapnel lodged in Baily's left hip and his friend, Bill Mawby, from New Town, removed it. Baily, like most other men at Gallipoli during November, suffered from dysentery and rheumatic pains caused by the cold and damp. During the evacuation, he and Mawby were the last to leave. Baily was so weak that he did not think he could walk the distance, so Mawby wrapped the Red Cross flag, made of fine Australian wool, around his back for warmth and support.

From 16 November until 3 December, when Baily boarded a hospital ship, the flag kept him warm as he and others sheltered in a leaky dugout from a huge thunderstorm, followed by a blizzard. The flag stayed with Baily for the duration of the war, returning to Australia in August 1919 on board the Ceramic. Baily asked his 'mates', mostly service personnel, to sign it, collecting over five hundred signatures.

About Harry (Bill) Baily

Joining Up

Harry (Bill) Baily was born in 1892, the eighth child of William, a Huonville merchant, and Louisa. Despite the protests of his mother, he signed up to go to war in March 1915, having sold his much loved motorbike. He was the first of his family to join – his older brothers, Percy and William, did so in 1917. Since he was a mechanic, Baily originally joined motor transport



Harry Baily c 1915 prior to leaving for Gallipoli JW Beattie (Photographer)

Collection: Tasmanian Museum and Art Gallery

but was persuaded to transfer to the C Section of the Seventh Field Ambulance because of his big frame. Stretcher-bearers needed to be strong because, with no ambulances at Gallipoli, the men carried wounded soldiers a long distance over difficult terrain. Baily was a mischievous recruit, frequently flouting leave regulations, but in Brisbane during May 1915, just before the Seventh Field Ambulance left for the front, he went to the YMCA tent and 'I gave myself up ... to go strate [sic] in life. I wish I had of gone before'.

At Gallipoli

The Seventh Field Ambulance sailed to Egypt on the Ascanius, taking five weeks. After training in basic surgical procedures, they went on to Gallipoli, arriving on 15 September. The following day, they relieved the New Zealanders at the dressing station under Hill 971. The men worked long hours at an exhausting pace in nearly impossible conditions and in constant danger of Turkish fire. In the dressing station, they carried out first aid and cared for ill soldiers with limited medical supervision because there were not enough doctors. Baily also delivered despatches on a bicycle. Despite dysentery, rheumatic pain, and a recent shrapnel



*Red Cross Flag on hill 971 above 7th Field Ambulance Dressing Station, Gallipoli
Collection: Tasmanian Museum and Art Gallery*

wound, he helped to move the dressing station on 15 November. Although Baily was almost too weak to walk to the new site, he helped to set up the new camp and build a dugout. After enduring terrible weather, he boarded a hospital ship on 3 December and went to Egypt where he was hospitalised with pleurisy and jaundice. Doctors tried to return him to Australia four times but because of his 'hard battling' against the idea, did not. While in Egypt, Baily tried to interest senior officers in his inventions, an automatic stabiliser for planes, a crankless engine, and a two-inch gun.

In England

Baily arrived in England on 11 June 1916, initially going to Parkhouse Camp, near Salisbury, and then to the Engineers Training Depots at Christchurch, Dorset and Brightlingsea, Sussex to learn gunnery so that he could perfect his inventions. Norman Allom, an assistant architect, and Rae Gluyas, a mining engineer from Broken Hill, drew up plans. Baily began making frequent trips to London in an effort to have the inventions patented and taken up by the armed forces. He received a 'good hearing' but had few expectations because there was 'far too much red tape for a private to do any good'. Baily also failed to get a transfer to the Engineers as he hoped and had to return to the Australian Army Medical Corps. He may have gone to France with them for five months in 1918 but, if so, no one wrote it into his war record. An unexpected result of Baily's trips to London was that he met Lorna Gibbons whom he married on 20 December 1916. She

already had two children from a previous marriage, Delcie, aged thirteen, and Maurice, aged twelve. The couple had another daughter, Yoland Marjorie, on 14 January 1919. Baily returned to Australia with his wife and three children on the Ceramic in August 1919. The army discharged him as medically unfit on 14 December. He spent a short time in a Melbourne hospital recovering from the effects of the war and then moved to Sydney.

In Australia

Lorna Baily died within a few years of arriving in Australia and her children returned to England. His second wife, Isabelle, helped raise Yoland, who died when she was eighteen. A second daughter, Suzanne, was born in 1938. Baily settled in Devonport where he set up Baily's Auto Garage, a small engineering works that sold new cars and tractors. He became a member of the Returned Soldiers League and the Devonport Masonic Lodge. According to Suzanne, he was a 'big man' in size and personality, a 'stickler for the right thing' who was well known along the north-west coast. She says that he 'had the most wonderful life' doing things 'at the drop of a hat' such as going to Queensland to look for ambergris. His greatest pleasure was organising charity stage productions, including a folies bergère complete with metal robot costumes made in his garage. In old age, he lived with Suzanne and her husband before moving into the Freemasons Home, Hobart. Baily died in 1975.

Relationship between soldiers' service performance and physical training volume

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Abstract

Background: To be able to improve soldiers' service performance it is essential to know what factors are an influence upon it.

Purpose: To examine the relationship between soldiers' service performance and physical training volume during an international peacekeeping mission.

Materials and Methods: Seventy-one male Norwegian infantry soldiers who had joined a 12-month mission in the Kosovo Force (KFOR) were included. Every soldier reported the daily physical training on a monthly report form, and the soldier's service performance was evaluated by the closest superior officer. An explorative factor analysis confirmed a four-factor model based on data from previous KFOR soldiers (n=1461). The factors describing soldiers' service performance were: I) professional skills, II) open mindedness, III) mental strength, IV) sociability. The internal reliability was adequate.

Results: Physical training volume positively predicted the soldiers' mental strength ($R^2 = 0.08$; $P = 0.012$). Soldiers with high mental strength had a 66% higher mean physical training volume than the soldiers with low mental strength ($P < 0.05$). No relationship was found between the other aspects of soldiers' service performance and physical training volume.

Conclusion: Soldiers' physical training volume is associated with soldiers' mental strength, a critically important aspect in stressful situations.

Keywords: army, peacekeeping mission, mental strength, physical activity

Introduction

Soldiers' military service performance depends on many factors, which vary according to the mission. During some missions, a soldier's service may be dominated by undemanding physical tasks like guard duty and office work. On the other hand, the average light infantry rifleman in the U.S army transports over 43 kg of critical combat equipment¹ indicating that, for these soldiers, good physical fitness is an essential factor affecting performance. Good physical fitness has been found to have both physiological and psychological benefits that

may reduce stress, illness and injuries²⁻⁵. Developing good physical fitness in soldiers may also improve morale in the unit, help build character, and improve soldiers' perception of being prepared for the mission⁶.

It is difficult to study human performance in complex environments such as wars or peacekeeping missions. The few papers that have been published have a "lesson learned" perspective where experience about altitude training, injury treatment, equipment and physical capacity is discussed⁷⁻⁹. When studying performance of elite athletes, a multitude of different disciplinary approaches including behavioural, physiological, biomechanical and psychological have been employed. Psychological approaches vary from more phenomenological approaches¹⁰ to traditional trait approaches¹¹. Such studies are seldom available in the military sciences.

One way to evaluate military service performance could be to study different factors that are perceived to be relevant by officers and military personnel with adequate experience. In the present study four aspects of soldiers' service performance, defined as professional skills, open mindedness, mental strength and sociability were evaluated with respect to the soldiers' physical training volume during an international peacekeeping mission in order to reveal possible relationships.

Methods

Seventy-one male Norwegian infantry soldiers, aged 20.5 ± 1.8 years, who served in the same unit during a 12-month mission in the Kosovo Force (KFOR) participated in the study. The soldiers were volunteers for Kosovo, and had the same training background, rank and experience as a soldier. The study was approved by the Regional Ethics Committee, and written informed consent was obtained from the soldiers.

Every soldier reported his daily physical training on a monthly report form for nine months. The monthly response rate was $85 \pm 8\%$. Training volume, frequency and type of activity were reported for all obligatory and voluntary physical training in sweatsuits. Registration of training volume started 45 days after arrival in Kosovo and ended 3 weeks prior to demobilization. Physical training volume is reported in hours per week.

Each soldier's service performance was evaluated at the end of the Kosovo mission by his closest superior officer. Each officer evaluated 7-8 soldiers whom he/she knew well. In fact, in most cases the officer and soldiers had been working together for almost two years. Evaluation was based on a 20-item questionnaire. Two of the questionnaire items were excluded due to lack of relevance for the factorial analysis, leaving 18 items to be used for the analysis. The questionnaire consisted of statements about different aspects of the soldiers' capabilities. The truth of the statements was rated using a 7-point scale (1 = low degree of truth; 7 = high degree of truth), and a higher composite subscale reflected higher levels of the capabilities being measured. The items in the questionnaire were developed in two main versions. The first version was originally developed for the evaluation of the introduction of a personality test¹². The initial goal was to create a questionnaire that was based purely on military experience and was relevant for international operations, was easy to use and was comprehensive. Twenty Norwegian officers with extensive experience from international missions were gathered at an expert conference in order to discuss and develop the content of the questionnaire. The officers served at the Army's headquarters or other relevant units. Their conclusions were transferred to items on the questionnaire. This transfer was carried out by military psychologists and psychometricians¹². Finally, the questionnaire was re-evaluated by the expert officer and then used for the evaluation of the service performances of military personnel at the NORBAT (Lebanon) and SFOR (Bosnia) missions. The evaluation had a longitudinal design, with the same measurements being repeated three times. The second version of the questionnaire was used during the KFOR (Kosovo) mission. The second version is an improved and expanded version of the original, integrating experiences from the SFOR mission and military operational knowledge by officers serving under this mission. This study analyses data collected with the second version of the questionnaire.

An explorative factor analysis, principal component analysis with varimax rotation, was applied and confirmed a four-factor model that accounted for 63% of the total variance. The four-factor model was created from a larger sample of previous KFOR soldiers (n = 1461). The factors were labelled: I) professional skills (five questionnaire items), II) open mindedness/flexibility (four items), III) mental strength (three items), and IV) sociability and ability to relate to people (four items).

A linear regression analysis was used to examine whether physical training volume predicted any of the four factors describing service performance.

After it was found that physical training volume positively predicted mental strength, a post hoc analysis

was conducted to determine the difference in training volume between a high mental strength group and a low mental strength group. The two groups were defined by an extreme median split, $\pm 0.25 \cdot$ standard deviation¹³, and only data from soldiers who had reported their training volume throughout the service were included. The difference in the groups' physical training volume was determined by an independent sample T-test.

Results

Statement	Factor			
	I	II	III	IV
Shows professional skill	0.775			
Carries out requested tasks conscientiously and trustworthily	0.737			
Helps others to serve their duty	0.676			
Takes initiative	0.628			
Finds new and useful solutions	0.596			
Shows openness to change and development		0.748		
Collaborates and shows openness to other people's point of view		0.741		
Tolerates provocation		0.699		
Considers an issue from several viewpoints		0.684		
Stays calm in challenging and demanding situations			0.863	
Has strong mental health (is not anxious, depressed or lacking in self-confidence)			0.777	
Adjusts own aggression level to what is required in the situation			0.617	
Extroverted				0.826
Capable of negotiating				0.573
Considerate of other people				0.563
Affable and in a cheerful mood				0.560
Chronbach's alpha for each factor	0.82	0.79	0.74	0.73

Absolute values less than 0.5 were suppressed. One item was deleted because it was loading in two components.

Table 1. Factor loadings from the rotated component matrix analyses, and the factors Chronbach's alphas.

Table 1 shows the factor loadings for each item included in the four factors describing the soldiers' service performance, and the Chronbach's alphas. The overall score for soldiers' service performance was quite high. Weekly physical training volume was two hours (Table 2) and primarily consisted of voluntary strength training (73%) and endurance training (27%). The correlation matrix of the four factors of service performance showed that only mental strength was positively correlated to physical training volume (Table 3). Regression analysis showed that physical training volume positively predicted the soldiers' mental strength (B = 0.20; 95% CI: 0.035 - 0.373; R² = 0.084; P = 0.019). No other significant results were found between the other factors of soldiers' service performance and physical training volume.

	Mean score	Min-Max
Factor I: Professional skill	5.35 (0.71)*	3.83 - 6.67
Factor II: Open mindedness	5.01 (0.85)*	3.00 - 6.75
Factor III: Mental strength	5.38 (0.90)*	3.33 - 7.00
Factor IV: Sociability	5.22 (0.75)*	2.25 - 6.50
Physical training volume (h-week-1)	1.95 (1.28)	0 - 5.13
Number of physical training sessions per week	1.8 (0.2)	0 - 4.9

* Scale of 1 to 7 with 7 being the highest level of the capabilities being measured.

Table 2. Mean score with standard deviation for the different factors related to soldiers' service performance and weekly physical training volume with the number of training sessions.

The post hoc analysis conducted to determine the difference in training volume between the high mental strength group and low mental strength group showed that the high mental strength group had a higher physical training volume throughout the international military service (Table 4).

Pearson Correlation	Training volume	Professional skill	Open mindedness	Mental strength	Sociability
Professional skill	0.18				
Open mindedness	0.15	0.64**			
Mental strength	0.29*	0.38**	0.40**		
Sociability	-0.05	0.63**	0.57**	0.20	
Sum of all factors	0.19	0.83**	0.84**	0.67**	0.75**

n=66. *Correlation is significant at the 0.05 level. ** Correlation is significant at the 0.01 level.

Table 3. Correlation matrix for the factors included in service performance and physical training volume. Sum of all factors is mean score for the four factors of service performance.

Period	Mental strength group	n	Physical training volume with standard deviation (hours week ¹)
1: Sept, Oct, Nov	Low	23	1.19 (0.91)
	High	16	1.66 (1.39)
2: Dec, Jan, Feb	Low	23	1.82 (0.80)
	High	16	2.92 (1.86)*
3: Mar, Apr, May	Low	23	1.30 (1.44)
	High	16	2.36 (2.24)
Mean	Low	23	1.44 (0.84)
	High	16	2.39 (1.49)*

* Different from low mental-strength group (P<0.05).

Table 4. Difference in mean weekly training volume between the high mental strength group and the low mental strength group during the 9-month international military mission.

Discussion

In this study we wanted to examine whether soldiers' physical training volume during a 12-month peacekeeping mission was related to their military service performance defined as professional skills, open mindedness, mental strength, and sociability/ability to relate to people. The overall finding of this study is that soldiers' mental strength is positively related to their physical training volume, and that soldiers with reported high mental strength have a much higher training volume than soldiers with low mental strength. One limitation in the study design is that the soldiers' service performance is derived from both the objective and subjective opinion of their closest superior officer.

Clough and Earle (2002) studied mental toughness, a concept thoroughly debated in the sport sciences and related to mental strength¹⁴. They reported that more mentally tough individuals could cope more easily with physical and mental demands. This finding suggests the possibility that soldiers' performance might improve if mental strength is increased. The

relationship between physical training and mental strength found in the present study indicates that physical training could improve soldiers' mental strength, as mean training volume in the high mental strength group was significantly higher (66%) than in the low mental strength group. Although we cannot claim a causal relationship due to the correlational design of this study, it is plausible that a reciprocal relationship exists between physical training volume and mental strength. That is, that physical training increases mental strength, and/or that mentally strong individuals are able to value the benefits of staying fit and therefore prioritise physical exercise, even under difficult conditions.

From a practical point of view these results indicate that officers should be especially aware of soldiers with reported lower mental strength and their physical training during a military peacekeeping mission. Soldiers in this group will probably need more organised and individualised physical training.

The soldiers in the present study were involved in a peacekeeping mission with periods that varied from very tense in unstable areas to calm with ample training opportunity. This is reflected in the variation of the training volume (Table 4). Since several studies have shown that soldiers' physical training volume decreases after basic training^{15,16} it seems reasonable to recommend that the military emphasise the importance of continuous physical training, even during military missions.

Research has shown that soldiers returning from deployment are likely to have increased emotional problems and somatic complaints, and increased use of mental health services¹⁷. Sareen et al. (2008) found that most mental health problems among Canadian soldiers deployed on missions were attributable to a wide range of common civilian putative risk factors rather than combat¹⁷. Since a growing body of knowledge shows that physical training reduces both illness and stress⁴, physical training could also be effective for deployed soldiers. Therefore, physical training during a 12-month mission could enhance

the soldiers' physical and mental condition and possibly prevent the emotional and somatic problems some of the soldiers experience after the mission. If physical training can be conducted in such a way that it triggers all aspects of mental strength, the increased value of the physical training to the military would be multidimensional.

Conclusion

Mental strength seems to be related to physical training, and should be investigated further within a military context. It would be interesting to examine different methods of enhancing mental strength, including physical training and more traditional mental training methods used in elite-level sports. Overall, the results also illustrate the complex nature of a military service performance during a 12-month peacekeeping mission. Further investigation in this area is needed to improve the understanding of factors affecting service performance. Such an understanding could improve selection of soldiers for missions and facilitate individualised training of soldiers.

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A review of routine vaccinations in the Special Operations Working Accommodation, Holsworthy, Sydney, NSW

Dr Nevin Colgrave, MBBS (Hons), MPH, FRACGP

Abstract

Background: The Tobruk Lines Health Centre (TLHC) is the primary health care facility for the Special Operations Working Accommodation (SOWA) at Holsworthy Barracks, Sydney. TLHC has responsibility for maintaining routine vaccination currency of members, a component of operational readiness.

Purpose: This study aims to utilise an electronic database to audit vaccination currency at SOWA and ascertain which routine vaccinations are due.

Materials and Methods: A review of TLHC vaccination statistics on the ADF's Medical Information Management Index (MIMI) was performed, followed by a manual audit of the medical documents of each member with routine vaccinations due.

Results: The audit found that 78 SOWA members were due at least one routine vaccination, representing approx 9.75% of TLHC's dependency (i.e. 90.25% of members were up-to-date with routine vaccinations). A total of 94 vaccinations were due, with 73 of these being for typhoid vaccination.

Conclusion: The discrepancies between several members' written vaccination records and the records on MIMI suggest greater efforts need to be made to keep MIMI data up-to-date. The large number of typhoid vaccinations due suggests that the need for boosters should be anticipated when members undergo Annual Health Assessments (AHA) and/or pre-deployment medicals. A follow-up audit would assess the accuracy of vaccination records for those members recorded on MIMI as being up-to-date with routine vaccinations.

Key Words: routine vaccinations, Special Operations Working Accommodation, Tobruk Lines Health Centre, Medical Information Management Index

Conflict of Interest

Dr Colgrave is a Medical Officer based at SOWA.

Introduction

SOWA is located in Tobruk Lines, a precinct within Holsworthy Barracks, South Western Sydney. SOWA is a new facility, completed in 2008 to accommodate special operations units in the Sydney area, and currently houses the 2nd Commando Regiment (2 Cdo), the Incident Response Regiment (IRR), and elements of the Special Operations Logistic Squadron (SOLS) and Special Forces Training Centre (SFTC). The primary health care for members in the SOWA is provided by a mix of uniformed, public service and contracted health care providers including medical officers, nursing officers, physiotherapists, psychologists, medical assistants and enrolled nurses.

The Medical Information Management Index (MIMI) is a non-proprietary suite of linked databases developed in MS Access. It is widely implemented across the ADF and includes the ability to track medical records, record administrative details regarding appointments and referrals, as well as record the elements of individual health readiness and identify members who are out-of-date. TLHC has been using this system as the basis to record vaccinations since 2008.

According to the MIMI, as of 5 Jan 10, TLHC currently has a dependency of approximately 800 full-time members (precise number withheld). This includes regulars and members on continuous full-time service. 97.2% of these members are male, with females making up the remaining 2.8%.

Routine vaccinations in the ADF are given in accordance with ADFP 1.2.2.1 – Immunisation Procedures.¹ Obtaining and remaining in date for the vaccinations listed in Table 4-1 of ADFP 1.2.2.1, is an integral part of the medical fitness component of a member's Army Individual Readiness Notice (AIRN), that is, readiness to deploy on operations. Members therefore not in date for routine vaccinations cannot deploy on operations unless granted a waiver. This can be a time-consuming process. Further, should

Disease	Vaccines	Dose	Primary Schedule	Booster Requirements
Diphtheria Tetanus Pertussis	Adult/adolescent formulation of diphtheria-tetanus-acellular pertussis (dTpa) ('Boostrix')	0.5ml IM	A total of 3 doses of dT, 4 weeks between doses	1 dose at age 15-17 or instead of dT dose
	Adult diphtheria-tetanus (dT) (ADT')	0.5ml IM		1 dose every 10 years
	Tetanus toxoid vaccine ('Tet-Tox')	0.5ml IM		1 dose every 10 years
Poliomyelitis	Inactivated poliomyelitis vaccine (IPV) ('Ipol')	0.5ml SC	3 doses 4 weeks apart	1 dose every 10 years (if deploying to polio endemic area)
	Oral poliomyelitis vaccine (OPV) ('Sabin')	2 drops PO		
Hepatitis A Hepatitis B Typhoid	Monovalent hepatitis B ('H-B-Vax II Adult')	1ml IM	3 doses at 0, 1 and 6 months	None
	Combined adult hepatitis A and B ('Twinrix 720/20')	1ml IM		None
	Monovalent hepatitis A ('Avaxim')	1ml IM	2 doses 6 months apart	None
Measles, Mumps and Rubella	Combined typhoid Vi polysaccharide and hepatitis A ('Vivaxim')	1ml IM	1 dose (followed by 'Avaxim' at 6 months)	None
Varicella-Zoster	Typhoid Vi polysaccharide ('Typhim Vi')	0.5ml IM	1 dose	1 dose every 3 years
	Measles-mumps-rubella (MMR) ('Priorix')	0.5ml IM or SC	2 doses 1 month apart	None
	Varicella-zoster vaccine (VZV) ('Varilrix')	0.5ml SC	2 doses 1-2 months apart (for non-immune persons)	None

Table 1 – Routine vaccinations in the ADF adapted from ADFP 1.2.2.1, Table 4-1

a waiver be granted and a member deploy, there is an element of risk that they will be exposed to vaccine preventable diseases. This could result in a member being medically evacuated from a deployed environment. A list of routine vaccinations for ADF personnel, as described in Table 4-1 of ADFP 1.2.2.1, is reproduced in Table 1.

When ADF members posted to SOWA units receive a vaccination at TLHC, the details of this encounter are entered into MIMI. A written record of the vaccination is also made in each member's *International Certificates of Vaccination (ICV)* booklet. Likewise, when new members march-in to SOWA units and hand their medical documents into TLHC, their ICVs are reviewed and details updated on MIMI, if necessary. This would, ideally, mean that each member's MIMI vaccination record corresponds reliably with the details in their ICV.

Material and Methods

A review of TLHC vaccination data on MIMI was performed on 05 Jan 10, with the aim of ascertaining

the percentage of the Centre's dependency that was in date for routine vaccinations. Details on the number and percentage of the TLHC dependency in date for routine vaccinations can be easily obtained from the Key Performance Indicators (KPI) from the main screen of MIMI by all health personnel at TLHC. The ICV of each member due routine vaccinations was then manually audited to reconcile vaccination records with MIMI.

Results

MIMI showed that approx 88.0% of TLHC's dependency was in date for routine vaccinations, with 99 members recorded as being due at least one routine vaccination. MIMI can generate the names and PM KeyS (ADF identification) numbers of members due vaccinations, along with details of the vaccinations and date they were due to be given. This list showed that there were 162 vaccinations due across 99 members, with six members recorded as missing eight vaccinations. The due dates for vaccinations ranged from 15 Dec 09 back to 22 Mar 98.

A closer review of the MIMI data revealed that several non-routine vaccinations were listed as being due, thereby increasing both the number of outstanding vaccinations and the personnel involved, and adversely affecting the vaccination Key Performance Indicator (KPI) of TLHC. Fourteen members were recorded as being due influenza vaccination, 10 due meningococcal vaccination (Mencevax ACWY or Menomune) and 10 due Japanese Encephalitis vaccination (Je-Vax). These three vaccinations are not routine vaccinations as dictated by ADFP 1.2.2.1, however are generally mandatory for personnel in special operations, given the command's high readiness requirement. Nonetheless, failure to receive any or all of these vaccinations does not affect AIRN compliance.

Enquiries made to the MIMI Helpdesk revealed that a programming fault meant some of the members missing up-to-date details for influenza vaccination, Mencevax ACWY or Je-Vax were erroneously listed on the database as requiring routine vaccinations. The software was updated on 06 Jan 10 to remove the three additional vaccinations from the 'Members Due ADF Routine Vaccinations' list and place them 'Vaccinations Due' list, which lists all vaccinations (both routine and additional) due. Following this update, the number of members due routine vaccinations fell to 93 (130 vaccinations), representing a KPI (percentage of dependency in-date for routine vaccinations) of approx 88.4%. This highlights the benefit of MIMI having an accessible helpdesk service that is receptive to making immediate adjustments to the software when faults are identified.

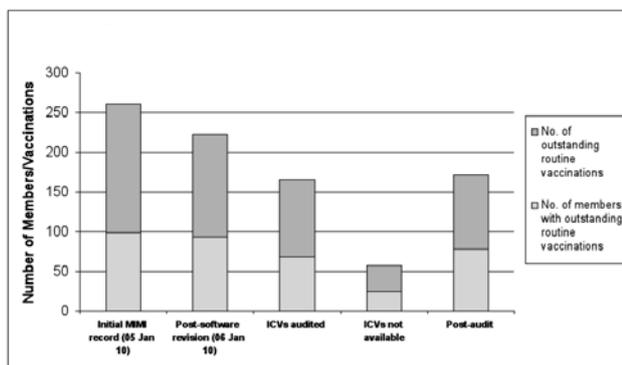


Figure 1 – outcome of MIMI routine vaccination audit

An audit of the vaccination booklets of all 93 members with outstanding routine vaccinations was then attempted. The medical documents for only 68 of these members (accounting for 97 outstanding vaccinations) were present at TLHC on 06 Jan 10, with the other 25 (33 vaccinations) presumably with the members deployed overseas or on ADF courses, or en route to another health facility as part of the 2010 posting cycle. The ICV for the 68 members were reviewed and MIMI updated accordingly. There were

36 cases involving 15 members where vaccinations had been recorded in member's ICV but not in MIMI. Once these were entered into MIMI, the number of members due routine vaccinations in MIMI fell to 78 (94 vaccinations), with a revised KPI for vaccination status of approx 90.3%. This could be broken down into 53 members with ICVs at TLHC (61 vaccinations) and 25 members with ICVs absent (33 vaccinations). The audit had increased this KPI by nearly 2%, with the number of outstanding vaccinations falling 42% (162 to 94). The outcome of the audit is illustrated in Figure 1.

The most frequently occurring vaccination due was typhoid (Typhim Vi), with 73 outstanding. This represented 77.7% of outstanding routine vaccinations and 93.6% of the 78 members with vaccinations due. The other outstanding vaccinations were poliomyelitis (IPOL or Sabin), with nine members due, MMR (four members), ADT (four members) and Twinrix (four members). These findings are shown in Table 2 and Figure 2. One explanation for the high percentage of outstanding typhoid vaccinations is the requirement for typhoid boosters every three years, compared with ten years for ADT and poliomyelitis and lifelong immunity for other routine vaccinations.

Vaccination	No. of Members Due
Typhoid ('Typhim Vi')	73
Poliomyelitis ('IPV' or 'Sabin')	9
MMR ('Priorix')	4
ADT	4
Hep A & B ('Twinrix')	4
Total	94

Table 2 – Routine vaccinations due at SOWA

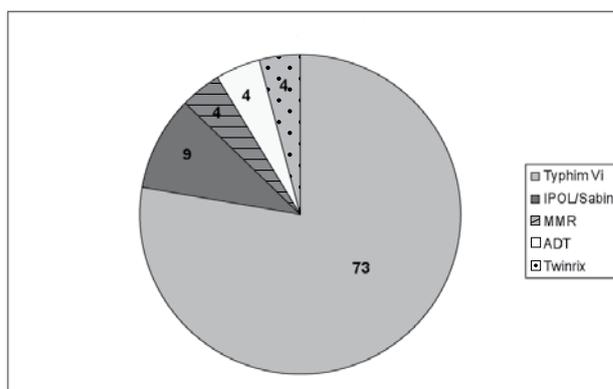


Figure 2 – No. of outstanding routine vaccinations post-audit

Discussion

The findings of the audit suggest that the KPI statistics on vaccinations recorded in MIMI do not necessarily reflect the actual number of routine vaccinations due.

Vaccinations are occasionally recorded in ICV booklets only and not in MIMI, falsely inflating the number of vaccinations outstanding. TLHC will need to give greater emphasis to data entry into MIMI to ensure the reliability of the information it conveys to Joint Health Command, SOCOMD [define abbreviation] and the Area Health Service.

The high number of typhoid vaccinations due shows that boosters are not being given in a timely fashion. All members are required to undergo an Annual Health Assessment (AHA), and many SOWA members also undergo pre-deployment medicals each year. At these presentations, vaccinations are reviewed to ensure their currency. However, it would appear that this opportunity to anticipate the lapsing of typhoid vaccination currency during the subsequent 12 months is not always taken. If this was done, members could be either be given a booster at the AHA or pre-deployment medical if it was due, or reminded of the date when their booster is due and an appointment made. Additionally, greater use of written reminders to members regarding due vaccinations should be utilised. Such reminders can be automatically generated by MIMI through each member's online vaccination record.

Maximising the proportion of SOWA members that are up-to-date with their routine vaccinations is an essential step in maintaining individual and unit readiness. TLHC has a duty of care to ensure that members are

medically fit to deploy and adequately protected from diseases that may be exposed to when overseas.

Conclusion

This was an audit to gauge how accurate vaccination status was reflected in MIMI. It was an incomplete audit as it only looked at those members flagged on MIMI as requiring a routine vaccination and did not confirm the accuracy of the vaccination records of those members shown as being up-to-date. It is possible that members' MIMI records have erroneous vaccination entries, thereby artificially inflating the routine vaccination KPI and recording members missing vaccinations as medically fit to deploy. Expanding the audit to include a review of all TLHC member's ICV to identify false positives in regards to routine vaccinations on MIMI is planned. The audit demonstrated the benefit of having ready access to a team that can correct programming errors in MIMI. It also highlighted the need for accuracy when recording vaccinations and the need for an ongoing process to audit information held in electronic systems.

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Air travel and pregnancy - with reference to obstetric and perinatal aeromedical retrieval

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Introduction

There are a number of well accepted risks for the air traveller^{1,2,3,4}. Although the risks are generally low for the healthy traveller, there are subgroups in the population that are at higher risk for developing complications as a result of the flight environment. Amongst these groups are the pregnant traveller and the neonate. Air travel during pregnancy is generally considered to be safe with little risk to the healthy pregnant women or her foetus^{1,3}. In line with current guidelines⁵ most airlines accept carriage of pregnant women up to 36 weeks gestation. There have been several studies showing that flight during pregnancy is safe^{6,7}. Although it is generally accepted that the foetus is more safely transported in utero than as a neonate in an air-transportable incubator, there is at least one study that shows no significant difference in neonatal morbidity and mortality rates⁸. With the increasing use of aeromedical perinatal retrieval services it would be intuitive to assume there would be a corresponding decrease in perinatal and maternal mortality rates. However, it is difficult to conduct appropriate studies to investigate this area, and those studies that have been conducted have provided some surprising results. This article will appraise the safety of air travel during pregnancy. In addition, aeromedical retrieval during the perinatal interval is examined.

The safety of air travel during pregnancy

Anatomy and physiology of pregnancy

Pregnancy brings about significant changes in anatomy and physiology. The anatomical changes are due to the enlarging vascular uterus which steadily increases in size, displacing other organs as it rises from the pelvic bowl into the abdominal cavity. The mass effect of the uterus causes partial occlusion of the inferior vena cava, leading to diminished venous return to the heart. The lowered venous return causes a decrease in cardiac output and blood pressure (systolic and diastolic). There is often an accompanying minor rise in heart rate. The mass effect is positional and is most pronounced when the woman is supine.

Manoeuvres such as rolling the supine patient fifteen degrees to the left will decrease some of the occlusive pressure from the uterus and facilitate venous return. The venous stasis in the lower limbs leads to oedema and predisposes to thrombosis. The enlarged uterus is also much more prone to trauma with potentially significant haemorrhage. Tidal volumes are decreased and the rate of respiration increases. Physiologically, there is also an increase in intravascular volume and anaemia secondary to hypervolaemic dilution. As a result of this the signs of shock in the pregnant woman appear later than usual – after the loss of 2 to 2.5 litres of blood^{2,9,10}.

Anatomical or Physiological change	Effect
Enlarged uterus	Vulnerable to trauma Aorto-caval obstruction Decreased venous return Lowered cardiac output Lowered systolic and diastolic BP Reflex tachycardia Lower limb oedema Predisposal to thrombosis Decreased diaphragm movement Decreased tidal volume Increased respiratory rate Increased frequency of micturition
Increased intravascular volume	Hypervolaemic dilutional anaemia Late appearance of shock
Increased renal excretion	May require increased doses of medication
Hyperemesis gravidarum & delayed gastric emptying	Prone to in-flight motion sickness Fluid and electrolyte disturbance
Raised white cell count	May confuse interpretation of investigations.

Table 1: Anatomical and physiological changes of pregnancy, as related to aeromedical transfer.

Possible air travel hazards for pregnant women

Physical confinement for prolonged intervals is commonly encountered during air travel. Thromboembolism is a common cause of morbidity and mortality amongst pregnant women. Prolonged immobility is associated with an increased risk for the development of deep venous thrombosis (DVT)⁷ and dehydration is another commonly accepted risk factor. The hypobaric hypoxia encountered in flight is not thought to be prothrombotic^{11,12}. The risk of DVT is thus not increased by the unique environment of flight, but rather it is due to the prolonged immobility that usually accompanies flight.

Another possible risk to the mother and her foetus is the hypobaric hypoxia encountered during flight. Typically, short haul flights will maintain a cabin pressure of 6,000 feet, whilst long haul flights maintain pressures of 8,000 feet. These cabin pressures reduce the alveolar partial pressure of oxygen to 73mmHg and 64mmHg respectively (compared to 103mmHg at sea level). At 8,000 feet, maternal haemoglobin remains 90 per cent saturated, even though the maternal PaO₂ is 64mmHg. The foetal PaO₂ remains virtually unchanged due to the increased oxygen carrying properties of foetal haemoglobin and the Bohr effect¹. One study examining the oxygen saturation levels of healthy airline passengers showed that slightly over half (54%) had SpO₂ values less than 95% at cruising altitude, with a range of values between 85-98%¹³. The human foetus is thought to develop normally under low-oxygen conditions such as those encountered when pregnant women live at high altitude, maternal hyperventilation helping to maintain arterial oxygenation⁷. A study conducted amongst women living at high altitude for a prolonged interval demonstrated lower neonatal birth weights¹⁴. There is a significant difference in the length of exposure to hypobaric hypoxia between the pregnant women living at altitude for months and the pregnant passenger, in the air for several hours.

Radiation exposure is also known to be increased with air travel¹. In general, the higher the latitude or the flight level, the greater the exposure. The mother and her foetus are both exposed during air travel; however the radiation dose is usually 0.005 to 0.01 mSv per hour and the cumulative dose is thus negligible when compared to the annual maximum permissible dose for pregnant flight crew (US) of 1mSv. The pregnant air traveller would have to complete 100 to 200 hours of flying to even approach the permissible safe dose.

Does air travel affect pregnancy outcome?

Despite the significant changes in anatomy and physiology in the gravid female there are multiple studies that find few, if any, harmful effects. Air travel

during pregnancy does not seem to pose a significant risk to the pregnancy^{6,7}. These studies show minor variations in findings, which were usually not reproducible in another study.

One study involved a sample group of 222 pregnant women and concluded that there was no correlation between adverse outcomes, hours spent travelling by air or the gestational age at the time of travel⁶. Importantly, this study showed no correlation between gestational age at delivery, neonatal birth weight, rates of vaginal bleeding, preterm delivery (less than 37 weeks), preeclampsia, neonatal intensive care admission or cumulative adverse obstetric outcome.

No effect ^{6,7}	Possible effect ^{7,15}
Gestational age at delivery ⁶	Increased risk of preterm (34 to 37 week) delivery in primiparas only ⁷ Slight increase in spontaneous abortion rates when exposed to flight in early pregnancy ¹⁵
Neonatal birth weight ⁶	
Incidence of vaginal bleeding ^{6,7}	
Preterm delivery ⁶	
Preeclampsia ^{6,7}	
Neonatal intensive care admission ⁶	
Caesarean section rate ⁷	
Neonatal death ⁷	
DVT ⁷	

Table 2: The effects of air travel on pregnant women.

Another larger study group involved 546 healthy women who flew during pregnancy⁷. There were 447 women in a separate control group. The study group women flew for the first time in the pregnancy at a gestational age of 11.2±2.2 weeks, with average flights lasting 7.8±1.2 hours. The women had a median of seven flights. This study showed differences between outcomes for primigravid and multigravid women. Air flight amongst primigravidae was associated with an increased risk of preterm births at 34-37 weeks gestation. Gestational age at delivery was 36.1±0.8 weeks, with lower birth weights (2684±481 g) compared with the controls (39.2±2.1 weeks; 3481±703 g). (The lower birth weights were commensurate with gestational age.) Among the primigravidae, a relationship was found between gestational age at delivery and gestational age at first air travel and total hours airborne. No such relationship was shown among the multigravidae who travelled by air. Overall, the groups did not differ in the incidence of more serious complications, including risk of vaginal bleeding, preeclampsia, caesarean birth, or birth asphyxia/neonatal death. Further, no individual variable was significantly or independently associated with adverse neonatal outcome when results were corrected for maternal age, race, parity

and the trimester at the time of air travel⁷. In addition there were no cases of DVT in this study. This suggests that DVT is no more common in pregnant women who have flown than those who have not. However it may also reflect increased awareness of the risk of DVT, and that pregnant air travellers are taking heed of the standard advice to remain active in flight, avoid alcohol and remain well hydrated.



Figure 1: In flight advice on DVT prevention is now routinely given by commercial carriers, often preceding the in-flight entertainment. Photo J. Stephenson (@ANTAS B747 flight – with permission)

Whilst these studies have shown only minor or nil effects, attention should be drawn to a retrospective cohort study conducted amongst Finnish flight attendants who had worked during early pregnancy. There were 1751 eligible pregnancies eligible for analysis. Flight attendants who worked during early pregnancy had a slightly elevated risk of spontaneous abortion, as compared with attendants who were pregnant outside a time span of active flying¹⁵. Whether this single study reflects a definitive finding will only be determined by further studies, each correctly designed using appropriate cohorts, with longitudinal follow-up to minimise bias.

In summary, air travel for the pregnant traveller is safe, and this is summarised in two recommendations by the American College of Obstetrics and Gynaecology (ACOG) Committee on Obstetric Practice. The first ACOG recommendation states that pregnant women at significant risk for preterm labour or with placental abnormalities should avoid air travel¹⁶. The second ACOG recommendation states that pregnant women can safely fly up until 36 weeks of gestation⁵. Most commercial airlines have guidelines which are similar to the ACOG recommendations, with some permitting domestic travel until 36 weeks and international travel until 35 weeks gestation.

Aeromedical transfer – unborn foetus or neonate

Background

Acute antenatal aeromedical transfer is an accepted means for providing specialist perinatal and obstetric care¹⁷. The alternative is local delivery and postnatal transfer of the neonate and the mother. In countries such as the USA, aeromedical transport services were often commenced with the intention of bringing neonates to tertiary level centres. Over time it was realised that the early transport incubators were less than ideal, and that the mother was the ideal “incubator”. The end result was the commencement of aeromedical transfers whereby the gravid woman was brought to specialised neonatal and obstetric centres². There have been numerous studies examining and comparing each mode of transportation, with the majority of studies showing that transport of the foetus in-utero produced better outcomes. This practice has now been accepted as the preferred transport option, and is recommended by various bodies including the British Association of Perinatal Medicine and Clinical Standards Advisory Group on neonatal transfers^{18,19}. In September 2004, the British Thoracic Society recommended that when possible, healthy term babies should not fly in the first week of life. In addition, they recommended that premature babies, who have had complications, probably should not fly on commercial flights until 6 months after their due dates, due to the increased risk of apnoeic episodes²⁰. (Fact box A contains a list of those maternal groups most commonly transported. Fact box B contains a specific list of conditions.)

Fact Box A - Which maternal patient groups do we transport

- The goal is to transport only one patient-the mother-prior to delivery.
- Studies on fixed wing and rotary wing aeroretrieval patients revealed that the two commonest reasons for transfer were:
 1. Premature labour or Preterm labour (PTL); and,
 2. Third trimester vaginal bleeding.
- To this should be added a third group (from Royal Flying Doctor Service experience),
 3. The elective transfer of “high-risk” patients to tertiary centres.

Fact Box B - Specific obstetric disorders commonly transported

Vaginal bleeding

- Causes include infection, miscarriage and hormonal. All are common in early pregnancy.

PTL (Pre-Term Labour)

- Can be the primary reason for the flight and may occur during flight.

PROM (Premature Rupture of Membranes)

- PTL +/-precipitous delivery.
- Predisposes to infection.

Precipitous delivery

- Not always predictable.

Pre-eclampsia and eclampsia

- Pregnancy Induced Hypertension (PIH) can then lead on to eclampsia.

Amniotic fluid embol

- Cause Pulmonary emboli (PE) and Cerebrovascular accidents (CVA).
- Major cause of Disseminated Intravascular Coagulation (DIC).

Malpresentation

Infection

- Amnionitis

transfer is less than in infants transferred after delivery²⁵⁻³¹. Some authors have reported no significant improvement in outcomes⁸. Others have ascribed the differences to confounding variables, such as birth weight and gestation at delivery³², or different work practices^{33,34} as likely factors to explain the findings. The absence of an appropriate control group may also offer an explanation¹⁷.

Some benefits of transferring a high risk foetus in-utero rather than delivering locally include: increased infant survival rates, higher five minute APGAR scores (which reflect an infant in better condition and probably lower morbidity), shorter hospital stays, and enhanced mother-child bonding²³. In addition, there has been a claim that the transfer of the high risk foetus in-utero (by rotary wing transfer) is cost effective²³.

Whilst some studies have concluded that there are benefits to transferring the foetus in-utero, other studies have reached equivocal or negative conclusions. One study concluded that neonatal survival following local delivery with or without postnatal transfer is the same as for antenatal transfer¹⁷.

Flight issues

Aeromedical transportation of the gravid female is usually safe for both mother and foetus^{1,2}. The single most feared complication when transporting the gravid female is in-flight delivery and subsequent resuscitation of a distressed, and often premature neonate²¹. Fortunately this is a rare event with very few in-flight births occurring^{22,23}. At standard cabin pressures, the maternal inspired concentration of oxygen (FIO₂) is adequate to meet the demands of both mother and the foetus. In cases where the mother or the foetus is distressed, the mother should be given supplemental oxygen during the flight². Aeromedical evacuation staff should err on the side of providing oxygen if any doubt exists.

The most commonly encountered in-flight complications during in-utero transfer, were nausea and vomiting. The frequency of contractions was also significantly increased. Other complications such as hypertension, hypotension and decreased maternal respiratory drive were relatively uncommon²⁴.

Supporting and conflicting studies - in-utero transportation versus neonatal transportation

Many studies have concluded that neonatal morbidity and mortality in infants delivered after in-utero



Figure 2: An older style foetal incubator. This model could operate utilising 120V AC, 12 or 24 V DC power and was certified for aeromedical transfer use.

In-utero	Neonate	No difference
Pre-term rupture of membranes.	Placental abruption more common in mother.	Neonatal mortality.
Preterm labour.	Decreased administration of corticosteroids.	Respiratory distress syndrome.
Pre-eclampsia.		Intraventricular haemorrhage.
Lower mean birth weight.		Necrotising enterocolitis.
Lower gestational age.		Persisting ductus arteriosus.
		Septicaemia.

Table 3: In-utero and neonatal transportation are associated with different patterns of infant and maternal morbidity. A summary of the more likely patterns of morbidity found in the in-utero group and the neonatal transfer group. The third column is a list of complications that could occur regardless of whether the infant had arrived in-utero or as a neonate. (Based on Hauspy et al)³⁵.

A 12 month study conducted in the Northern Region of the UK, involving 129 transfers, revealed some remarkable results¹⁷. The study highlighted that a large number of infants transported in-utero remained undelivered at the receiving hospital with 24% of mothers either being discharged home or transferred back to the referring unit. Further, many of those infants who had been transferred in-utero, and whose mother was in active preterm labour, did not actually require intensive care admission (only 31% of women in preterm labour). Possible explanations for these facts would include: that the transfer was performed as a logistic exercise (bed capacity issue), that the initial assessment at the requesting facility was inadequate or incorrect, or that there simply was good obstetric care at the receiving institution. All of these possibilities certainly make valid (and statistically significant) analysis all the more difficult.

In Australia there are vast distances between rural and outback communities and tertiary-level neonatal and obstetric centres. This contrasts with the aeromedical transfer experience in many other parts of the world, including the UK and Europe, where most intrauterine and neonatal transport occurs over a relatively short distance³⁵. Due to these vast distances in Australia, there is often elective transfer of pregnant women from remote areas to urban areas at 36 weeks of gestation. Pregnant women who are thought to be at risk for developing obstetric complications, and those identified as high-risk for social reasons are amongst those electively transferred. (Fact box C contains a list of those patients who may be electively transferred at 36 weeks gestation.)

Fact Box C - Elective Fixed Wing transfer of “high risk” patients

These patients are moved electively to tertiary centres at 36 weeks gestation for a variety of reasons - the patient is not so much high risk in some cases, but is an unknown quantity. Subgroups would include:

- Previous poor outcome - foetal death or significant maternal complications.
- Scant or absent antenatal care (ANC).
- No local birthing service.
- Significant intercurrent disease - diabetes mellitus, infections, poor nutrition, alcoholism.
- Social reasons - risk of child/mother abuse by partner, possibility of abandonment of newborn.
- Patient is markedly remote from any medical care.

In summary, it would appear that the consensus opinion is for the transfer of the foetus in-utero, and this is reflected in the conclusions of the majority of studies. There are a significant number of transfers that result in the gravid women not delivering, and even being returned to the referring institution. In addition, the majority of neonates delivered at the tertiary institution do not require neonatal intensive care. Whether this is due to the timely transfer in-utero or poor patient selection is not clear. Whilst the studies would seem to support in-utero transport as the preferred option, the limitations of the studies to date need to be borne in mind – most of the studies involve short distance aeromedical transfer, and there is ongoing difficulty in most of the studies with providing appropriate control groups for comparison. (Fact box D lists contra-indications for obstetric aeromedical transportation.)

Fact Box D - Contradictions for aeromedical transfer of obstetric patients

(Note there are no absolute contra-indications to aeromedical transfer.)

- First trimester
 1. Uterine bleeding (with cramping).
 2. Suspected ruptured ectopic.
- Second and third trimester
 1. Active labour.
 2. Uterine bleeding.
 3. Cervix >4 cm dilated.
 4. Incompetent cervix, untreated.
 5. Severe pre-eclampsia.
- Postpartum
 1. Heavy vaginal bleeding.

The impact of aeromedical retrieval on perinatal mortality.

Background

The perinatal interval is defined by the World Health Organisation as the interval from 24 weeks gestation (or 500g) to 28 days neonatal life. In other countries, such as South Africa, the perinatal interval commences with foetal viability (28 weeks or 1000 g) and ends at the end of the seventh day after delivery. Perinatal deaths are the sum of stillbirths plus early neonatal deaths occurring within this interval. The perinatal mortality rate (PNMR) is expressed as the number of deaths per 1000 births. The PNMR is the most sensitive indicator of obstetric care³⁶. For developed countries the rate for babies over 1000g is usually less than 6/1000 births, whereas for developing countries PNMR ranges from 30-200³⁶. The first generation of rotary wing aeromedical retrieval services commenced in the 1970's. The second generation was developed and refined in the 1980's. Many of these services originally commenced with the intention of transferring critically ill neonates. The aeromedical transfer of the in-utero foetus and neonate (in an incubator), remains commonplace. Aeromedical transfers are resource intensive and require considerable organisation - consuming the time of nursing and medical staff³⁷. It would be intuitive to hypothesise that these transfers should lower mortality rates.

Studies on perinatal mortality following aeromedical retrieval

Acute antenatal transfer to specialist centres is relatively commonplace; however there is a paucity of data on the pregnancy outcome¹⁷. Several studies have claimed that infants of high risk patients born after the mother has been transported via aeromedical services (to a tertiary neonatal centre) have lower mortality rates^{26,28,38}. A large study over a one year interval in the UK, involving 120 transfers, concluded that neonatal survival (and hence mortality) following local delivery with or without postnatal transfer was the same as that following antenatal transfer (to a specialist centre)³⁷. Another very large study involving 800 transfers highlighted that many neonatal transfers were being performed from one area to another as there were bed shortages at the originating medical facility. In a significant number of cases, neonates were transported from similar secondary and tertiary level centres to another - so called "capacity transfers"³⁷. This study highlighted the lack of capacity within the region's neonatal service. The performance of multiple elective perinatal aeromedical retrievals for capacity reasons alone will dilute any data that may support the notion that perinatal retrieval *actually* lowers mortality rates.

There is a paucity of studies that precisely analyse whether aeromedical retrieval services influence perinatal mortality rates. A confounding factor in any study of regional perinatal mortality rates was highlighted in one study from northern Australia which correctly pointed out that local perinatal mortality rates were probably improved as the result of aeromedical transfer of the high risk mothers and premature or sick neonates³⁹. The corollary of this statement is that perinatal mortality is likely to be increased in the tertiary centre receiving the aeromedical transfer. Again it would be correct to state that it is difficult, if not impossible to design studies that have appropriate controls for these circumstances.

Conclusion

Air travel during pregnancy is accepted as being safe. There are caveats which apply to the acceptance of pregnant women for regular air services, and these are summarised in position statements from several sources. There appears to be a consensus that in-utero aeromedical transfer is preferred to transfer of the newborn neonate in an incubator. This policy has probably resulted in increased maternal and neonatal survival with an accompanying decrease in morbidity. Whilst this policy would appear to be sound, it is correct to point out that there are studies which conflict with this assertion. In addition, the aeromedical transportation comes at a considerable financial cost and is labour intensive. Some studies have highlighted that many aeromedical transfers are being performed for reasons of bed capacity, rather than for clinical reasons. The success of in-utero transport is difficult to assess due to problems in designing appropriately controlled studies. This same problem with study design is further highlighted when evidence for the lowering of perinatal mortality via aeromedical transfer is sought. With time further studies will help to clarify this situation.

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An holistic view of post-traumatic stress disorder

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Introduction

Post-Traumatic Stress symptoms account for an increasing number of presentations to health service facilities by Australian Defence Force personnel. The cost of management is absorbing a significant proportion of the defence health budget, much of it expended on external health care providers.

The recent disproportionate increase in mental disabilities, such as Post-Traumatic Stress Disorder, compared with war inflicted physical injuries is of significance and has serious implications for the ADF and its role as an effective fighting force.

This paper will examine some aspects of the diagnosis and management of PTSD from the perspective of a general clinician who has been an ADF medical officer since 1980 and undertaken several deployments.

Service in the Australian Defence Force

Military service by definition is inherently dangerous. Implicit in the defence force work contract for uniformed personnel is an acceptance that there will be exposure to environmental hazards, potential injury, disagreeable sights and long working hours. On deployment this is compensated by tax-free pay and campaign allowances which are more generous than those offered by our coalition partners; for example, Britain and New Zealand do not provide tax-free pay to their personnel on deployment. All ADF personnel who deploy on war-like service are volunteers.

Strict ADF-imposed caveats on limiting exposure to hostile activity result in only the Special Operations Task Group component of Australian contingents being involved in a traditional war fighting role. About 80% of contingent personnel provide support and logistics.

Casualty rates in the Australian forces have been declining since World War 1 – 60,000 killed in WW1, 27,000 killed in WW2, 300 killed in Korea, 500 killed in Vietnam, nil killed in the Gulf War 1991, 1 killed (accidental) in Somalia, nil killed in Rwanda, 2 killed (accidental) in E. Timor, 1 killed (accidental) in Kuwait, 1 killed (accidental) in Iraq, 1 killed (accidental) in the Solomon Islands and 11 killed in Afghanistan.

On a pro rata basis, ADF casualties are light compared with those of our allies; for example, Canada has had 140 killed in Afghanistan while Britain has had over 250 killed.

The Diagnosis of Post-Traumatic Stress Disorder

Post-Traumatic Stress symptoms may manifest in various ways, some obvious such as depressed mood or poor workplace performance, while other presentations may be more subtle. The first indication may be raised by the results of the Kessler-10 or Post-Traumatic Check List-C questionnaires conducted at Return to Australia Psych. Screening or Post-Operational Psych. Screening at three months.

The subsequent referral to a civilian psychologist or psychiatrist often confirms the diagnosis in accordance with the Diagnostic Statistical Manual of Mental Disorders (DSM) symptom criteria. Relevant pre-morbid aspects of some of these members, for example, mood disorders, alcoholism, disciplinary problems, incompatibility with service life, pre-existing marital disharmony – are rarely considered. Such revelations might detract from a formal diagnosis of PTSD. In some personnel with no exposure to potential harm a PTSD diagnosis is possible as “it may be triggered by memories conjured up by what others have mentioned – a recognized phenomenon in some individuals with PTSD” (Paljakka BOI, 2008) – so called vicarious PTSD.

Of concern is that a number of Returned Services League pension officers, acting as de-facto clinical consultants, determine a diagnosis of PTSD from their checklist before the member has been formally assessed. Consequently some members are insistent that they have PTSD from the outset and will not accept another diagnosis. It could be construed that these members may have been coached by their colleagues or advisers, especially if their Department of Veterans' Affairs claim forms have quotations from the DVA Statement of Principles or the DSM .

A friend of mine for over 30 years (ex-ADF) recently showed me his psychiatric report confirming PTSD regarding an alleged fatal helicopter crash that he witnessed. He admitted that the incident was a complete

fabrication and stated to me, and I quote, "Mate, the psychs will believe anything".

Management

Once the diagnosis of PTSD is made the patient enters a program consisting of counselling, cognitive behavioural therapy, psychiatric consults, sometimes anti-depressant medications, in-patient treatment etc.

In some treatment programs the reinforcement of a victim mentality with a prominent focus on 'self' can impair a member's insight and distort reality. Albert Ellis' Catastrophe scale, as part of a behavioural therapy approach, is an old way of re-introducing some perspective to patients, for example, "you have these distressing symptoms but are they as bad as what happened to the people you saw who were injured, mutilated or killed?" None of my PTSD patients seem to have been made aware of it. Some members embark upon the convalescent leave "treadmill", becoming disengaged from their workplace and disinclined to return to work, eventually being medically discharged. The administrative burden on a unit with a member on prolonged convalescent leave, who is unable to be gap-filled, can be significant. An integral part of long term management is the award of a life-long DVA disability pension, which several members have admitted to me was their motivation for seeking a diagnosis of PTSD.

My first PTSD patient in 1994 was discharged from the ADF as totally and permanently incapacitated at the age of 31 and thereby unable to engage in more than 10 hours of paid work a week for the term of his natural life. Despite having a pre-morbid personality disorder (nickname "the angry ant") the treating psychologist did not acknowledge his anti-social tendencies as a pre-disposition and attributed an array of inconsistencies in his story to "rationalisation". It was interesting to observe the immediate lifting of his depressed mood on receiving his TPI determination. This outcome was inappropriate for a healthy, muscular man capable of working a normal week and he was subsequently investigated for breaching his work restrictions.

Discussion

The current broad definition of PTSD, which not only includes the direct threat of harm but also the perception of threat of harm and the hearing of stories of harm (vicarious PTSD). It appears unsustainable in a volunteer Defence Force which will of course be placed in such a position.

The subjective nature of the history and symptoms requires an accurate assessment to determine authenticity, which is usually beyond the capabilities

of civilian psychologists and psychiatrists who cannot conduct a critical analysis. Some specialists appear too willing to confirm a diagnosis of PTSD mainly on the basis of a check list of symptoms and an unverified history direct from the patient.

Some diagnostic reports display a credulous naivety that would be amusing were the consequences not so serious, as there is sometimes considerable embellishment by the member. One report I recently read from Camp Victory, Baghdad in 2007 (I was present during the stated period and remember the person) sounded more like the Battle of the Somme - an exaggerated, disingenuous story recorded as fact. The psychiatrist confirmed PTSD although I remain sceptical, as the member had pre-existing issues and was not a stellar workplace performer.

It appears that, not uncommonly, psychological symptoms in conjunction with a history of operational deployment can lead to a diagnosis of PTSD.

In a few cases that I have part-managed, my impression was that the member satisfied the DSM criteria for malingering rather more than PTSD, so as to avoid responsibility for their actions; for example, dereliction of duty, insubordination etc. In some situations I know that PTSD has been used as a legal defence before a Defence Force Magistrate, as opposed to being used in mitigation. Such behaviour can be detrimental to Unit morale and create antagonism towards the member.

I believe that a diagnosis of PTSD should be based on a comprehensive, holistic assessment of the patient with the diagnosis arrived at by consensus among the various professionals involved in management. The referring primary care physician and unit medical assistants often have valuable knowledge and insight regarding the member.

A medical tribunal, with military representation, would be an appropriate body to make a comprehensive assessment of a member as access to all medical, service and Unit records would be possible and so allow composition of an accurate profile.

If the K-10 and PCL-C questionnaire results are to be believed, then it appears that successive generations of Australians are becoming less able to tolerate the demands of war-like deployments. At the 2008 AMMA Conference in Hobart, Dr. Tyler Smith PhD reported that the US Navy had the lowest reported incidence of PTS symptoms in the US Forces. In contrast, Australian data suggested that the RAN had the highest reported incidence of PTS symptoms of all our 3 services.

This discrepancy in findings between two allied navies is disturbing, as it suggests either diminished mental

resilience in the RAN or low threshold diagnostic criteria in Australia.

The fact that the RAN contingent to the first Gulf War (16 Jan – 28 Feb 91) has over 20% of those personnel on mental disability pensions, mainly for PTSD, despite firing no weapons offensively, sustaining no battle damage and taking no battle casualties, is of serious concern. Likewise the 2nd Australian contingent to Rwanda, 20% of whom observed the Kibeho massacre, now has over 80% of the contingent personnel on mental disability pensions, mainly for PTSD. I understand that some claimants were on leave in Nairobi, Kenya (800 kms away) during the incident. Some of the pension recipients voluntarily deployed to East Timor on war-like service five years later enabled them to submit further DVA claims for exacerbation of their PTSD.

During March 2003 I was presented with an interesting situation when a member of my ship's company informed me that he was in receipt of a DVA pension for PTSD from a helicopter crash 16 months previously, from which he escaped with a minor injury. He admitted that some of his work onboard involved visiting other ships by helicopter. I asked him how he reconciled this inconsistency and he stated to me, and I quote verbatim, "Sir, you get over it". A significant comment from a pensioner who had volunteered for a war-like deployment.

My personal impression is that many of those with true PTS symptoms have a short to medium term condition that requires clinical management in isolation from the financial inducement to delay recovery offered by a DVA pension (in young soldiers with 60 years of life ahead this could amount to over a million dollars). RSL pension officers generally emphasize compensation aspects and, consequently, some members have an unrealistic sense of entitlement.

I do not dispute the diagnosis of PTSD but believe that it is often diagnosed in preference to other conditions which do not gain compensable DVA recognition.

A life-long disability pension is inappropriate in the majority of PTSD patients as most do not have a life-long disability, although awarding a pension can have a dramatic therapeutic effect. An apparent psychological disability, diagnosed on subjective criteria, should be confirmed as life-long from a retrospective viewpoint. In contrast, a significant physical injury with objective signs can be determined as life-long from a prospective viewpoint.

Unfortunately there appears to be developing some disturbing similarities between repetitive strain injury of the 1980's and PTSD. Such conditions, diagnosed mainly on subjective parameters and questionnaires, are prone to manipulation which can result in unreliable findings determined by the members' desired outcomes.

Conclusion

Contrary to current opinion, I believe that the prevalence of PTSD in the ADF is overestimated and that the number of genuine cases is significantly less than believed. The propensity to diagnose PTSD in preference to other conditions that might be the cause of members' symptoms and behaviour is of serious concern in that appropriate management, medical or otherwise, may not be implemented.

ADF morale is likely to deteriorate in the long term and resilient personnel become disillusioned if PTSD becomes the primary focus of the ADF Mental Health Strategy. An independent, financially disinterested Commission of Inquiry should conduct a review of all aspects of diagnosis and management of PTSD in the ADF, possibly as a sequel to the Dunt Inquiry. Widespread ADF participation should be encouraged.

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Experiences of a Prisoner of War: World War 2 in Germany

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On 16 December 1943, I was sitting at the Navigator's seat in a very noisy Lancaster bomber over Berlin when something occurred that changed the pattern of my life. We had just dropped 13,000 pounds of bombs... a 4,000 pound "cookie" plus incendiaries and we were stooging along at 163 mph (280 km/hr) taking infra-red photographs for the first time in WW2, when we were attacked from below by a German night fighter which hit the port wing and fuselage, setting the wing on fire and wrecking my instrument panel.

Several hundred gallons of petrol burning less than 20 feet from you is an occasion for rapid action in the way of evacuation of the area, which five of us did before the plane blew up or crashed. We did this through the forward escape hatch and used parachutes.

The difference was astounding.

Out into the cold night air (it was about 2020 hours) count 5, pull the rip cord, a jaggging thrust in the thighs and back and... utter silence. The ground came closer and I could see snow around but I was probably dazed by a blow I had received in the aircraft when a cannon shell hit my instrument panel and glass and metal went everywhere. Anyway, I didn't see the church steeple that snagged my parachute and I hit a wall, causing a fracture of the right epicondyle and a Potts fracture of the right ankle.

I came to in a German doctor's surgery being stitched up with our pilot and bombardier present too. Then we were taken to part of a German maternity hospital under guard in Berlin. My leg and arm were plastered and 2 days later we were taken by train to Frankfurt-am-Rhein to Dulag Luft, a holding camp, where we were put in solitary confinement

The Germans did not heat our cells and a damp plaster on one arm and one leg in the middle of a German winter doesn't induce much sleep.

Next day we were interrogated. Before each operation we'd been reminded at briefing that, if captured, we would give only rank and name. My interrogator spoke perfect English and began (when he saw my plasters) "Oh! Bad luck! Well how are things at Spilsby"...my home base. A bit disconcerting for a start and he asked a lot of questions but I feigned loss of memory, pointing to the cuts on my head.

After interrogation, we were put back into our cells for a day and another interrogation and after that taken to the transit camp proper. After the guard closed the gate and wrapped a large chain round the post and padlocked it, he uttered in English (probably all he knew) that deathless prose we were to hear so many times "For you, the war is over!"

After Christmas, we were moved to Zagan, Upper Silesia (in the former Polish territory) by cattle-truck (8 horses, 40 men) to Belaria compound of Stalag Luft 3. This was 5 to 6 kilometers away from the main camp which also had a North, South, Centre, East and West compound plus a jail, a hospital and a German 'vorlager'. We were very fortunate at Belaria and indeed at Stalag Luft 3 generally. This was a POW camp for Allied Officers who were flying personnel. It had been planned by Goering himself as a "super" camp because he was a WWI flyer himself.

Belaria at that stage had 8 huts for accommodation, each with an ablution area with washbasins, 3 or 4 showers, usually cold, and a urinal. Half of one hut was given over to a sick-quarters or 'Lazaret'. Belaria also had a ration store with a kitchen attached and an "abort"...an 8-holer in 2 rows of seats.

The Lazaret had a long room (about 40 ft by 15 ft) with a bench down one side, cupboards underneath and a washing sink. It had an examining couch and stools for patients to sit on while being treated. It had an old microscope and a hand driven centrifuge.

The rest of the Lazaret contained a room, which was a dormitory for 10-12 men in double bunks; a cooking area with a stove fired by wood or brown coal briquettes; plus an Elsan type toilet and wash basin. There was a small room to house an infrared lamp and a UVL lamp. There were also two cupboards, one for linen and the other for food storage and medical supplies.

I was the camp doctor's first patient at the Lazaret. He was looking for patients as we entered the camp at Belaria. An Irish lad named McIlroy was another patient. He came from Dublin and when we asked why he was in the RAF he replied with a wicked grin "Well, we can't have these Germans knocking the British about, else who would we fight after the War". He had an old compound fracture of the thigh, which took a hell of a long time to heal and was obviously very painful,

but he did not complain once and always had a grin. Another patient was Tommy Hughes who had a badly cut head, with shaven hair and masses of bandages; Ginger Rutherford, a Geordie with a lot of cuts and bruises, and a young spitfire pilot, Stan Griffith, with a huge black-eye and frostbite after loosing a boot. We all spent 7-10 days there but McIlroy and I were there longer.

Apart from the camp doctor, CAPT Monteuis RAMC, who was captured at St Valery in 1940, there was an Australian medical student who had been a Hampden pilot, Geoff Cornish. He had been a POW for nearly 3 years and spoke German. There were 4 WO NCOs who between them did the cooking, cleaning, linen washing and attended the fires etc. They were magnificent and one, Peter Brewer, was also a masseur, which was invaluable. These all formed the staff of the Lazaret with German approval.

My arm was taken out of plaster at the end of January 1944 and I spent 1/2 hour 3 times a day "climbing up the wall" to overcome the bruising and avoid ankylosis. The leg had had a walking plaster put on and a heel made of wood with a piece of rubber tyre covering it. This plaster was removed in mid February and I will always be GRATEFUL TO PETE Brewer for his efforts with my rehabilitation.

I spent the next 2 months in the camp general with the other POWs who had arrived at Belaria at the same time. Then the camp doctor asked me to join him and help in the Lazaret as the camp was growing rapidly in numbers.

German Camp Staff and Routine

The German staff were members of the Luftwaffe. Initially in charge was Hauptman Wemer until the number of POW's grew and the Oberst (Colonel) arrived. He had been invalided from the Stalingrad front but I did not discover his name. Wemer then became Adjutant and had a Leutenant as Abwehr (Defence) Officer and he was in charge of Felwebel Glemnitz and several "ferrets". These were either Unteroffiziers or Gefreiters (Corporal or Soldiers) who wore blue dungarees with a belt and a small Mauser pistol. They were also "armed" with screwdrivers with a very long blade for poking and probing, looking for any contraband. In the camp, POWs were 'on parade' twice daily for roll call and the ferrets used to inspect the huts while we were parading.

Since it is the duty of POWs (especially officers) to escape when possible, much camp activity was geared to acquiring maps, making "ausweiss" (passes), civil clothing from uniforms, photographs and of course tunneling. This activity was under the control of 'X' wing Commander Bob Tuck, who organised a system that kept tabs on all ferret movements. If it looked like

one was getting too curious about activities related to escaping some body (usually a German speaker) would be detailed to engage him in conversation and so head him off.

Originally Belaria was full of POW from Commonwealth Air Forces but extra huts were built to house US Army Air Corps officers as more and more were shot down. This was when numbers in the camp shot up and Dr. Monteuis, who was known as 'Twee', after find finding out that I had been a medical student, asked me to join the Lazaret staff to help out, about April 1944.

Dr. Monteuis was a very unusual man. His father was French and his mother Spanish. He had very black hair and a black moustache which came down over his mouth and which he frequently chewed, when he was not smoking. He was pigeon-toed and constantly gave the Germans the idea he was a bit mad, walking round the compound pretending he had a dog on a lead. This was completely a pose.

He was fiercely dedicated to his patients, within the very severe limitations of camp life, and used to try and teach his helpers bits of anatomy and physiology during the evenings after work. It was extraordinary how 'busy' we were, just fixing up the POWs with their ailments, with which they reported very readily; after all, there was little else to do. His great philosophy was "patients get better in spite of our efforts and not always because of it" and "Nature had been at this game (of practicing medicine) for a long time and is very good at it."

It is appropriate here to consider differences between the prison camp conditions for Allied POWs held by the enemy. I must emphasize that conditions in the German camps I was associated with were worlds apart from those in Japanese camps. The latter had a total of 132,134 allied prisoners of whom 35,756 died i.e. 27%. Of these, 22,376 were Australians of whom 7,777 died. The Germans and Italians had almost twice as many, 235,473 with a death rate of 4% (242 Australians). From comparisons I have from a doctor who was in an Italian camp and from 2 or 3 prisoners who were in both at same time, the German conditions were better.

Belaria had apparently been a cadet training area for the Wehrmacht before it was turned into a prisoner of war camp. To do this, the Germans had separated off some huts to form their admin centre or vorlager and then surrounded the remaining huts with a double row of barbed wire, about 4 metres high, with a gap of a metre between the rows. At ground level, between the rows, coils of barbed wire were laid. Within the perimeter, a wooden rail was placed about half a metre from the ground and 3 metres from the wire to mark the limits of movement for prisoners. On one side of the camp was another compound that housed

Russian POWs. On another was a playing field area, also surrounded by barbed wire. The third side was eventually used to build extra huts as the camp was expanded to accommodate extra prisoners. In the time from January 1944 to January a year later, the camp increased from the original 50-60 to over 1100 men.

The German word for POWs is "kriegsgefangenen" which inevitably became shortened to "kriegie". When we arrived, we were the first kriegies apart from 20 or so who had been 'purged' from the North Compound. These were old lags who had escaped once or twice and the Germans sensed something was afoot at North Compound in the way of an escape and removed those they considered ringleaders, including WGCDR Bob Tuck and Geoff Cornish. In fact, Operation 200 (the Great Escape) occurred about 6 weeks later.

The Senior British Officer (SBO) was a Group Captain who abjured us to wash or shower daily (cold water but we could get an occasional hot water dunk in a wooden tub) and shave at least every other day. Shirts and under clothes were to be washed weekly if possible. Hot water was made available twice daily from the camp kitchen in jugs. Soap was either the German 'ersatz' variety or non-existent except in some Red Cross parcels.

The value of these requirements became obvious after one had been a prisoner for a while. It is a shock to the system, to say the least, to be "transported within hours, from a comfortable Officers Mess to a situation where comfort disappeared, food was restricted and you had no freedom except to walk round and round the same piece of dirt every day". To let go and not bother (and a few did) would have been disastrous for morale.

We were fortunate at Belaria to have a few men who had been prisoners for some time to give us advice on life style change. Furthermore, services sprang up quickly which enabled those who were determined and interested in keeping their lives going. Classes in German, French and even Russian started. Other topics were used to give instruction and a library was started with books sent over the years to POWs. A theatrical group developed and a band consisting of a pianist, a trumpeter, a drummer, and two guitarists, and, of course, activities related to escaping.

Occupations

Parts of the camp in between huts were used as 'allotments' to grow a few vegetables but the soil was very poor, although potatoes and tomatoes would grow. I can't remember where the seeds came from for this venture.

All these gave some purpose to life. The Germans allowed us to go on to the playing field when it suited them (It was denied for some time after the Great Escape). Soccer

Occupations in a Prison Camp in Germany	
Skilled	Unskilled¹
Doctor	Map making
Dentist	Forging
Interpreter	Tailoring
Cook	Photography
Carpenter	Librarian
Musician	Acting
Mining Engineer	Brewing
	Ferret watching
	Electrician
	Scenery painting
	Tin bashing
	Tunneling
	Soil dispersing

was popular and so was cricket. Union was played but the ground was very stony and injuries were common. In the winter, we hacked the frozen ground and made a small circular mound, 3-4 inches high and about 25 metres across on the playing field and flooded this with water to make an ice rink and play ice hockey, courtesy of skates sent by the Red Cross. Consequently, morale was fairly high and food was reasonable at least initially although this degenerated. Even so, a small proportion of POWs did not take part and "turned their faces to the wall". Most of these are self-explanatory and are referred to in the text. One hut was converted into a theatre, having been an assembly hall.

This was done by having the one carpenter in our midst making seats from Red Cross boxes in which the parcels were brought to the camp. Activity in this sea involved musicians, actors, painters, electricians and tailors (to make costumes) These gentlemen were also invaluable in altering uniforms to make them like civvy clothes for escape purposes. Most of the others mentioned were involved in the escape area. Tin bashers were those who used tins obtained from Red Cross parcels to make trays and dishes for cooking purposes. But the same expertise was turned to making long pipes when tunneling was going on. Using an old kit bag, a rough pump could be made and connected to the pipes so produced to provide air circulation underground for the tunnelers. This was a feature of the tunnel which let out 78 POWs in the North Camp in 1944.

Food

This consisted of a daily German ration (q.v.) handed out on a room by room basis. Hot water and a barley porridge was prepared in the kitchen where the Red Cross food parcels were stored and issued weekly under German supervision. These parcels were either British, Canadian, American, or New Zealand, plus an occasional Australian, or Argentine bulk issue. When we arrived, the ration was 1 parcel between 2 men per

Red Cross Rations		
Canadian 1 tin Spam (12oz) 1 tin Corned Beef (12oz) 1 tin Salmon (8oz) 1 tin Sardines (8oz) 1 tin Klim 1 pkt Coffee or Tea (4oz) 1 pkt Cheese 1 tin Biscuits (8oz) 1 Milk Chocolate (5oz) 1 pkt Salt & Pepper (1oz) 1 tin Butter (16oz) 1 pkt Sugar (8oz) 1 tin Jam/Marmalade (8oz) 1 bar Soap (2oz)	British 1 tin Luncheon Meat or Sausages (16oz) 1 tin Steak & Kidney or Curry & Rice (1 pound) 1 tin Salmon (8oz) 1 tin Herrings/Pilchards (8oz) 1 tin Biscuits (7oz) 1 bar Chocolate (4oz) 1 tin Bacon (8oz) 1 pkt Boiled Sweets (4oz) 1 tin Cheese (2oz) 1 bar Soap (2oz) 1 tin Margarine/Butter (8oz) Sugar (4oz) Dried Fruit (8oz) Tea (2oz)	1 tin Nestles Milk 1 tin Jam (8oz) or Syrup (4oz) 1 tin Rolled Oats/meal (5oz) 1 tin Vegetables (mixed/carrots) 1 tin Meat/Fish pasta (2oz) Salt, Mustard, Pepper or Marmite cubes Occasionally: tin Cocoa/Extra Biscuits (¼ pound) 1 tin Egg Powder (2oz) 1 tin Apple/Marmalade Puddings 1 tin Custard/Yorkshire Pudding Powder 1 tin Creamed Rice
New Zealand 1 tin Corned Mutton (16oz) 1 tin Beef (16oz) 1 tin Condensed Milk 1 tin Cafe-au-Lait 2 tins Tea (2oz each) & Sugar 1 tin Honey (6oz) 1 tin Butter (16oz) 1 tin Chocolate (4oz) 1 tin Jam (8oz) 1 tin Meat & Vegetables (16oz) 1 tin Cheese (8oz) 1 pkt Sultanas (8oz)	American 1 tin Spam/More (12oz) 1 tin Pork Luncheon Meat (12oz) 1 tin Corned Beef (12oz) 1 tin Salmon/Tunny (8oz) 1 tin Sardines/Brisling (6oz) 1 tin Coffee (3oz) 1 tin Powdered Milk-Klim 1 pkt Sugar (8oz) 1 tin Jam/Orange Juice or Peanut Butter (6oz) 2 bars Choc "D" ration (4oz) 1pkt Biscuits (7oz) or Cereal (8oz) 1 tin margarine (16oz) 1pkt Prunes (16oz) 60-100 Cigarettes 2 bars Soap (2oz each) 1 pkt Cheese (8oz) 1 pkt Pepper/Salt (1oz) 1 tin Rosemill Pate (6oz)	Australian Bulk This came 3 or 4 times per week while I was at Belaria. It was mostly dried fruit like sultanas, raisins, apple, pear, currants and sugar and was shared out on a weight basis for each man by the 'catering officer', a man detailed by the Senior British Officer (SBO) to do the job of controlling the issue of Red Cross Parcels. The Aussies bulk raisins used to get crusty on the outside of the fruit (long time travelling) and yeasty and this was very useful to make alcoholic brew which had quite a kick to it.

week and in the heyday became 1 per man per week, but this did not last for long and reduced until when we left Belaria in January 1945 ahead of the Russian advance from the East. It dropped to about 1 between 6. After we arrived at Luckenwalde, south of Berlin in Jan 1945, there were no parcels at all. As the bombing of Germany increased, the rail communications were increasingly weakened. Since the Red Cross parcels came from Geneva, we realised supplies would drop off so we tried to store food.

We could not store much because the Germans used to puncture all the tins at each end and the food would go bad if left too long. However, the tins of meat by Fray Bentos from Argentina were sealed with tin solder. This could be melted off by heating the empty tins and put over the puncture holes made by the Germans and so reseal the tins. Luckily for us, the puncturing took place just before the parcels were issued so the tins were only punctured for a few minutes before we got them and we sealed them quickly. There was of course no cold storage area (other than the camp kitchen) and the temperature at Belaria varied from a maximum in the summer of 40 degrees down to about -10 C in winter.

German Rations	
At Balaria: Jan 44 to Jan 45 (Weekly per man approx) 165 gm Margarine (6 oz) 165 gm Honey or Jam 60 gm Cheese 1800 gm bread (Dauerbrot) (1 loaf = 4 pounds) 1500 gm Potatoes 160-170 gm Sugar Vegetables (Swedes, Khol, Rabi, Cabbage, Peas in season) 100 gm (4oz) Bratlings Pulver or Semolina 50 gm Sausage (Blut wurst or bacon) 100-160 gm Meat (mince or beef or pork) per 2 weeks Barley 250gm per week usually cooked in the ration store and dished out on a daily basis.	At Luckenwalde: Feb-May 1945 (Daily per man approx) ½ cup Mint tea twice daily 2/3 litre Soup (Pea, Cabbage, Meat or Barley) 300 gm Dauerbrot 25 gm Margarine 750 gm Potatoes 25gm Sugar Salt c 15 gm meat (in stew) 30-40 gm per week sausage 50 gm per week Cheese or honey

In addition to the above, we in the Lazaret at Belaria got patient comfort parcels occasionally for food distribution to the patients and on a smaller scale. They were of British, US and Danish origin.

Illness & Injuries

As would be expected, common things were common. Cuts, bruises and sprains were everyday problems. Skin diseases were frequent as cuts tended to become septic but there were numerous cases of impetigo (probably a Strep B.). Syccosis barbi hit several and I recall 2 cases of erysipelas. URTIs were frequent, from rhinitis to tonsillitis to bronchitis; only one or two asthma attacks. And of course "D&V"; the squitters, colleywobbles, Montezuma's revenge.

Clothing

As would be expected, our clothes consisted of the items we were wearing when we were shot down and these would obviously not last forever. However, army pattern clothing became available, ration controlled, possibly obtained through Red Cross sources but undoubtedly some was material captured by the Germans in various places. We were able to have British army boots, shirts and wool underclothing and later some American greatcoats and gloves were available and kit. In addition, individual Red Cross parcels provided things like scarves, gloves, woolen hats and underclothing. There was no regularity about this and we had to make them last.

Medicaments & Treatment

Supplies came through the courtesy of the Germans and Red Cross via Geneva. Cotton bandages of various widths were available, and we used to wash the soiled ones to use again. Elastoplast was scarce but gauze dressings we available to be used dry or with petroleum jelly or ichthyol or even acriflavine we made up from tablets dissolved in water. Plaster of Paris was in powder form and used with cotton bandages to make splints and plasters. Metal splints like lattice were sometimes to be had and used again and again, either padded with cotton wool or bandages.

We could not rely on regularity of supply of any of these unless the Luftwaffe agreed to help us out. Generally they were quite helpful. The German doctor was Stabs. Arzt Hildebrand who was a rare specimen having a sense of humor. He would visit every 2 or 3 weeks and in emergencies if he could. Fortunately these occasions were rare. He would arrange for X-rays by having POWs sent under escort to the main camp hospital. Geoff Cornish and I have pooled our recollections and at Belaria plus North Compound, over an approximately 2-year period (up to 2000 men), the emergencies were:

3 cases of appendicitis requiring surgery

1 case of Hodgkin's Disease

3 psychiatric cases

3 POWs who were shot.

One of the psychiatric cases was under guard on the way to hospital and wandered off disorientated and was shot. It was not serious luckily, but the Luftwaffe was genuinely upset and arranged that any future cases would have a German speaking POW to accompany them. Later a case of deep melancholia was sent to a hospital east of Belaria with Cornish as part of the escort. Returning from the hospital, Geoff offered the guard some cigarettes if they would take him to a hotel for a beer... which they did!

LIST OF MEDICAL SUPPLIES (I am relying on memory)	
Bandages	Ung. Hydrag et Ammon
Elastoplast	Whitfield's Ointment
POP powder	Zinc Oxide Cream (1 tin!)
Syringes (inc. A minimone)	Ichthyol
Ampoules of Sterile Water & sodium chloride	Gentian Violet 1 %
Bottles (medicine)	Iodine
Kaoline Powder	Acrillavine Tablets
Tinct opii (scarce)	Menthol Crystals
Aspirins	Tinct Benz Co.
APC (Codeine)	Mist Ipecac.
Prontosil Powder (M&B693 -Sulphapyridine)	Mist. Pot. Cit
Prontosil Tablets	Calamine Lotion
Evipan sodium (Anaesthetic)	Petroleum Jelly
Ethyl Chloride Spray	Tab. Sulpaguanidine
Liquor Hammamelis	Lin. Meth. Sal.
	Some itamin tablets
	Possibly Xylocaine

The other shootings were:

A POW got drunk on "kriegie hooch" (made from raisins from Australian bulk issue; soaked in water; the raisins had a crust of sugar and yeast and this fermented). He ran out of his hut at night and collided with a Hundfuhrer, a guard with an Alsatian dog. In the ensuing melee the POW w back to his hut but was shot in the stomach and was taken to hospital. He survived.

In the third case, a kriegie was walking round the camp some time after 'The Great Escape' and touched the rail inside the fence of barbed wire. The trigger-happy guard fired at him and hit him in the hand causing a fracture of 3 metacarpals. This case was partly managed in the Lazaret and Hildebrand took him for X-rays to watch progress.

Two other cases at Belaria which were unusual were:

A needle stick injury to one of the hospital helpers, which became septic in spite of sulphonamides and osteitis set in requiring amputation of the terminal phalanx. The other was the case of a New Zealander, in his mid 20s, who developed phimosis which required circumcision. This was performed by Monteuis with Cornish giving Evipan. The result was a magnificent piece of surgery involving some 20 sutures. The patient was warned about not having an erection for fear of disastrous surgical consequences. He became so anxious that he organised a "Fire Drill" team consisting of the patient in the bed next to him having a large cardboard fan while on the other side was a patient with a huge chunk of cotton wool and a basin of cold water. On the command "Fire" one man fanned furiously, the other doused with cold sponges and the patient rang a hand bell energetically which was a signal for any member of the staff hearing the alarm to grab the ethyl chloride spray, rush to the ward and extinguish the impending blaze!

Cases in Lazaret: Inpatients & Outpatients

As previously stated common things were common:

Bruises and Sprains These received Liquor Hammamelis, a bandage and when appropriate, heat and massage.

Cuts & Wounds These were usually the result of carelessness or abrasions from falling. Treated with 1% acriflavine, they usually did well. The area the camp was in was a dusty farming area, and this could be a nuisance with larger wounds like burns. Sometimes we used Vaseline with a dressing.

Rhinitis was treated with inhalations of menthol..

Sore Throats and Tonsillitis received hot salt-water gargles. 2-hrly Bronchitis, received inhalations and mist Ipecac. The more severe and those who were pyrexial would be admitted to the Lazaret. If it was necessary to add Prontosil, their fluids were pushed with mist. Pot. Cit. If we had it, to reduce the risk of crystalluria, or kidney damage.

Urinary Infections received mist. Pot. Cit. and rest in bed and fluids ++

Headaches and minor aches got APC tablets.

Styes hot spoon bathing... a spoon with cotton wool held by cotton or a piece of small bandage dipped into hot water and held near the eye.

Diarrhoea often with vomiting was treated with a. Fluids only for 12-24 hours; if still present; b. Kaolin mixture sometimes with Tinct Opii.. If this worked, the question of how long to continue with medicine (being conscious of conserving resources) arose. Monteuis would ask, "Can you fart with confidence?" If "yes" generally stop medicine.

More severe cases (frequent bowel motions not seen to be responding to medicine & diet, perhaps pyrexial) were admitted and Twee would perform the 'fork test'... a stool specimen was obtained and if faeces passed through fork prongs, bed and sulphaguanidine was the treatment. Otherwise mobilise slowly with food from the invalid comfort parcels.

Skin Lesions. Tinea cruris & pedis was quite common and usually responded to Whitfield's ointment.

Urticaria ... calamine lotion

Impetigo was quite common and usually responded to Gentian Violet Solution.

Erysipelas...2 or 3 cases occurred and responded to hot dry packs and Prontosil.

The Long March

In the latter part of January 1944, the whole camp at Belaria was given 6 hours to move to an unknown destination. The Russians were then at Breslau (Wroclaw) some 35 km away and snow was 1/2 metre thick on the ground and still falling. The hospital staff were promised a horse and cart to carry medical supplies and our own belongings. In the event there was no horse so we pulled it ourselves. The rest of the POWs took the tables from their rooms, up-turned them, knocked off the legs, nailed them to the table top to make runners and tied a cord to the sledge so produced. Where the nails came from is a mystery but I bet the huts would not stand up in a storm when we left!

We left as a column of about 1000 men and the medical team brought up the rear. We were the doctor, plus 4 medical students (1 an American B17 pilot) and 3 or 4 helpers. At the time we left there were some 80 kriegies with colds, flu or diarrhoea or who were not well enough to march under the conditions. Because he spoke German, Geoff Cornish and one med. student were left in charge of them.

Our cart contained as much medical supplies as possible, plus invalid comfort parcels and our own food and personal items. It was at the end of the column so that any sick marchers could drop out of the column and be picked up as we passed. Our supply of aspirins and APC went down very rapidly.

Guards marched on each side of the column at about 20-25 metre intervals. The SBO walked up and down the column to keep an eye on things and the Oberst (Camp Commandant at Belaria) drove his car with the adjutant periodically up and down the column. We marched about 20km the first day, starting at about 4 am and passing the main Stalag Luft 3 camp (which seemed empty) on the way.

We were housed for the night in the barns of a farm run by Poles who gave the medical team a room to use for sick parade, which took about an hour. We were allowed to sleep in the room and they fed us thick soup. Next morning, we held an early sick parade (0700 hours) mainly of aching legs, blisters and frostbite. We only had one slice of bread for breakfast and had to march 15 km that day but we were able to hitch our cart to a horse drawn wagon going our way. We arrived at Gross Selten at 1530 at a large farm run by Germans and they allowed the medics to use an out house which had a boiler room where we were able to sleep. We shared this out-house with a Stabs Arzt (doctor) of a German SS panzer division & his staff. They gave us food which they cooked and we talked with them as best we could in bits of English, French and German but the only common language was "dog Latin"! Still, they also had some Schnapps! War is hell!

We stayed there a second day and, being very tired, enjoyed this. The Germans organised 2 sick carts for the next stage of our journey which was to Birkenstadt some 14 km further and we arrived again at about 1600 with the light fading at a farm worked by a Russian family, who gave us (the medical team) their own sleeping quarters for a sick-room and a bed room. Since the temperature outside was -10 deg C we appreciated this as well as the borsch they fed us that night and the hot coffee and bread we had next morning. We stayed there a second day and had a very heavy sick parade that day. Blisters and 'flu' were rife and the SBO managed to persuade the German commandant to take a few of the sicker POWs to the local army hospital at Muskau. The temperature rose and the snow melted off the road for our next move. Now the kriegies had to carry everything but we found moving our carts easier, especially as the weary guards liked to put their heavy packs on our carts and we made them help with pulling of course. All this time the 400 or so US Army Air Corps who had shared Belaria with us had been our companions but now the Germans separated us and moved them off in a different direction. We gave them 3 cheers as they pulled out and they went off singing songs like Dixie and McNamara's Band. The Germans just could not understand it; after all they had tried for months to sow dissension subtly. The Oberst just shrugged his shoulders, got into his car and drove off.

The guards shepherded by Feldwebel Glemnitz trudged on and many of them were worse than we. We traveled about 15 km that day and later in the morning, the SBO as part of his routine came back to the tail and of the column. The Oberst turned up again (with Hauptman Wemer) and he was furious. Wemer, who was not noted for his humor, was chuckling. The Germans had done a head-count as we left that morning and now the Oberst found he had "lost" 10 POWs but 16 guards had gone 'wek'.

We had started off later that day and it was almost dark when we arrived at our destination but we were allocated a farm outhouse again, fortunately with lights. Sick parade included many with 'rheumatism' for which we only had aspirin and lin. meth sal. But it seemed to work. Blisters were common. We slept in 3 feet of hay that night and German bread and cheese was issued. Next day we walked 7km to Spremberg railway junction, by now out of pre-war Poland and in Germany. We were assembled in 2 large sheds where we found kriegies from East Camp. We were given barley soup and a bread ration. A train arrived with the inevitable cattle trucks and we were taken to Luckenwalde, south-east of Berlin. There, Twee and I took a few really sick men to what turned out to be a British Revier or medical post manned by Irishmen while the rest of the medical team went to Luckenwalde camp.

The whole trip from Belaria had taken 8 days and we had marched over 80km and the rest by rail.

Luckenwalde

We arrived here mid February and the next 3 months to the end of the European conflict were the most uncomfortable and frustrating. Our numbers had been swollen by the addition of POWs from East Camp at Spremberg. We had also been joined there by a New Zealand doctor from East Camp and 2 medical students, one English and one Rhodesian. This was a help as we hardly ever saw any German medical staff and got virtually no supplies from them. We were housed in tall buildings without any subdivision into rooms but with an ablutions and toilet area at one end. Beds were in 3 tier bunks and the medical staff manipulated these in one corner of the building so as to make a square with one half of one side missing to allow access. One side was 8 two-tier beds earmarked as hospital beds for patients. All personal effects, food store and medical supplies had to be contained in this area, though storage became less of a problem as food ran out and so did medical supplies.

The Luftwaffe from Belaria were replaced by Wehrmacht members in this camp, which was virtually international. As well as the Air Forces contingent were US GI's, plus Dutch, Belgian and Polish civilians, all separated by barbed wire on an international basis.

We received no Red Cross parcels in spite of repeated assurances from the Germans that we would. Since the German ration was very meager we were supposed to be receiving the same ration a German garrison troops; this was partly depressing, since it meant hunger, but partly encouraging as it was due to lack of transport by rail and road owing to bombing and indicated clearly that the Germans' ability to resist much longer was severely diminished. News about the progress of the war was erratic, though a radio was held in the camp that

was able to receive the BBC but it had to be constantly dismantled and moved to avoid the Germans finding it. Nevertheless, by the end of March, morale was low and lack of food was a major factor.

In a sense, this was an advantage from a medical point of view. As our medical resources ran out there was less that we could do, other than reassurance to support those with upper respiratory tract infections and diarrhoea etc, but the kriegies were pre-occupied with blotting out their hunger and other ailments lost some of their impact, I suspect.

Later, in April, a German Panzer division was making a final stand in the area and moved around the camp as it retreated from the Russians. The commander sent word that any prisoners found within their lines would be shot on sight. This discouraged any escapes. He also sent a team to supervise surrender of any weapons in the hands of prisoners. These were dumped in a deep water-filled pit just outside our section of the camp and a surprising number turned up. One night, a JU 88 flew low over the camp firing at the advancing Russians and since it was 1 am this caused quite a panic.

In mid-April, the Germans suddenly told us to pack up and marched us to the rail yard. Before we got there, while we were in a deep cutting luckily, we were halted. A force of USAAC Martin Marauder bombers bombed the rail yards, out of the blue ending any prospective trip. We were marched back to camp, but not before some very resourceful POWs had managed to get to a damaged rail engine and removed its battery and carried it back to camp with them. This was very useful as a source of power for the radio and improved reception so that we had regular news bulletins. This had a major effect in improving our morale and a thoroughly depressing one for the Germans. They dared not interfere at this stage as their radio did not give anything like the real picture of the war and the smart ones could see it was nearly over because they listened to our news readers who passed news about camp.

Then early one morning in May, we woke to find there was not a German guard anywhere. About 3 or 4 hours later, a huge Russian tank rolled into the camp. The kriegies cheered them hilariously, climbing up the wire fences to wave. The Russians simply drove the tanks along some of the fences, flattening them. For about an hour after that, the medical staff were as busy as anything dealing with cuts and abrasions from injured POWs.

Homecoming

Now our troubles really started. The Russians did not have any food. But they instituted a Town Major who gave us written authority to commandeer food supplies; we had 2 Russian speakers among our lot who were loaned small trucks with drivers to go and collect vegetables and eggs from surrounding farms. But to get to the farms they had to cross bridges over canals guarded by Russians who had been told not to let anybody over bridges on pain of death. Since they couldn't read, they refused passage to our fearless food gatherers. Eventually this was overcome and we were able to have some nourishment while the Russians compiled a huge inventory of prisoners, which they insisted on having before we were moved on. One of my friends was talking to a GI during this period and the GI said they were lousy. "Funny", said Gordon, "I've never seen a louse". Whereon the Yank searched through his shirt and found one! Finally, the Russians loaded us on trucks drove us down autobahns, slipping off road through burning forest to avoid destroyed bridges, the drivers stopping to slake their thirst by sucking petrol up from the tanks till we got to the American sector. The Yanks gave us showers, deloused us with DDT powder sprays, fed us with pork chops, potatoes, peas, angel cake, pineapple and cream sauce all on one plate and gave us a bed. Next day they flew us to Brussels where the Canadians gave us a shower, DDTd us again, gave us food and a bed (after we had 'done' Brussels) and handed us over to the Royal Air Force the next day. They put us in Lancasters and flew us to England.

Back to square one.

1. WAR IS HELL
2. IT IS IMPORTANT TO BE ON THE WINNING SIDE.
3. IT IS EVEN MORE IMPORTANT TO BE ON THE MEDICAL TEAM.
4. DISCIPLINE NOT ONLY KEEPS UP MORALE; IT COMMANDS A MEASURE OF RESPECT AND WARDS OFF THE DANGER OF BRUTALITY BY THE ENEMY.
5. A SENSE OF HUMOUR IS VITAL.
6. HUNGER DESTROYS MORALE QUICKER THAN ANYTHING.
7. ADAPTABILITY IS SINE QUA NON.
8. THERE ARE NO FAT PEOPLE IN PRISON CAMP.
9. HOMOSEXUALITY IS NOT ESSENTIAL.
10. NOR ARE ANTIBIOTICS.

References

1. The unskilled faction includes jobs which prisoners had, in general, not performed before.

Cases in Pre-hospital and Retrieval Medicine*

Daniel Ellis and Matthew Hooper

**1st edition 2010, 286 pages, paperback with illustrations, ISBN 978-0-7295-3848-8, Churchill Livingstone, Elsevier, Australia. RRP AUD70.00.*

Pre-hospital and retrieval medicine is an essential component of the Emergency Medical System, critically so in Australia where geographical isolation often restricts patient access to specialised medical care. Retrieval medicine provides not only transport but also timely, high quality emergency care to the patient and a seamless interface between pre-hospital and hospital care.

Aeromedical retrievals are a relatively new field of medical endeavour and have evolved rapidly over the last 50 years. Much of the development in this field can be attributed to combat related initiatives. The use of civilian helicopters for emergency medical response and transport began in Europe in the late 1960s and the USA in 1969. Australia has been at the forefront of health based aviation since the development of the Royal Flying Doctor Service (or RFDS) in Cloncurry in 1928.²

Health personnel will encounter aspects of pre-hospital and retrieval medicine throughout the spectrum of patient care. For some this will be operational as either medical crew or tasking coordinators, while for most it will be as a referral agency or part of accepting hospital teams. Awareness of the differences between hospital or community based care and pre-hospital and retrieval medicine are essential to achieve the best outcomes for patients. This new text makes a significant contribution in developing this understanding, using an easy to read case based format.

Cases in Pre-Hospital and Retrieval Medicine is presented as a 286 page B5, soft cover publication. The body of the text consists of 50 cases and is divided into three main sections. These are – “A: Pre-hospital theme”, “B: Retrieval theme” and “C: Service development and special circumstances”.

In addition to this there is a table of contents, two forewords, preface, acknowledgements, author information, list of reviewers, introduction, appendices, key to cases, glossary and an index.

The introduction is worth reading as it outlines the standard format that the authors have used for each

case. This includes a brief description of the incident followed by relevant information divided into four sub headings – aircraft, local or ground resources, retrieval options / destinations and other key information such as weather. This is followed by questions and discussion, key learning points from the case and suggestions for related additional reading. Each question (between 1 and 4 per case) is followed by a 1000-2000 word discussion with associated photographs or tables. While cases can be read individually, they do build upon each other, and as the authors suggest should be read sequentially to gain maximal benefit from the text. Those after information about specific aspects of pre-hospital and retrieval medicine can use the key to cases at the back of the book to identify relevant material.

The book is easy to read and clearly set out. Particular strengths are the ‘Key Points’ boxes at the end of each section and the quality of the illustrations. The photographs are not simply decorative but also provide information that helps the reader to understand and ‘read’ a scene, adding a vicarious involvement in each case. The appendices are a valuable resource, addressing procedure and equipment issues and are representative of the approach to management advice, which is practical and clearly stated.

The cases selected offer insights into a broad range of issues in pre-hospital and retrieval medicine. This includes clinical care, team membership and system management issues. Trauma and mass casualty management are well represented as expected, with significant critical illness, paediatrics and mental health cases included also. The breadth of scope of this text is evident in the inclusion of military, dive related, bariatric, international and commercial aviation based cases. There are obviously significant difficulties in limiting the number of cases to 50. A notable omission for an Australian audience is the lack of toxinology cases (toxicology is included) while involvement in search and rescue activities is not mentioned. Additionally while obstetric transfers receive a brief mention there are no neonatal cases.

This is a specialised area of service delivery, even in retrieval medicine, and while many of the principles are common, inclusion may help both neonatal and other retrieval teams (adult, paediatric, mixed) understand more fully the differences involved.

Brief details of the two authors are provided at the start of the book. Dan Ellis is a Consultant in Emergency and Intensive Care Medicine at Lister Hospital, Stevenage, UK and Lead Consultant for the Essex and Herts Air Ambulance. Matthew Hooper, a dual certified Emergency Physician and Intensivist, is the Director of MedSTAR Emergency Medical Retrieval Service, South Australia and a Squadron Leader in the Royal Australian Air Force Specialist Reserve. Both authors have worked for the Children's Acute Transport Service and Helicopter Emergency Medical Service (or HEMS) in London as well as aeromedical retrieval services in Queensland and South Australia.

The text itself, as stated by the authors, 'is primarily designed for the 'hands-on' pre-hospital and retrieval doctor. It is also likely to be of interest and value to all those involved in the coordination, referral and reception of patients transported by pre-hospital and retrieval systems. The text is likely to be well received by its target audience and become an especially valuable resource to those starting out in this field. The criticisms mentioned previously are minor and do not in any way detract from the quality of the product. Instead it is likely that there will be an expanded second edition with not just a "top 50" but possibly a "top 100" case list. This is an excellent text and one that is highly recommended.

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References

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Therapeutic Guidelines: Psychotropic*

Psychotropic Expert Group.

*Version 6. xxv+325pp, paperback, ISBN 978-0-9804764-2-2. Melbourne, Therapeutic Guidelines Limited, AUD39.00, 2008.

Apart from major textbooks, there have been few handbooks published specifically on psychotropic guidelines. This sixth version of *Therapeutic Guidelines: Psychotropic*, part of a collection of 14 in the series of the popular and respected Therapeutic Guidelines series in Australia, is a major step forward in filling this gap. *Therapeutic Guidelines: Psychotropic* has a table of Contents, a list of Tables and Boxes, a list of the members of the Psychotropic Expert Group, a list of the members of the Sleep Disorders Expert Group, Acknowledgments, Endorsements, About Therapeutic Guidelines Limited and their Board of Directors, a Preface, 13 Chapters, four Appendices, a comprehensive Index and a Request for comment on guidelines proforma. It also includes 15 Tables and 14 Boxes.

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

As an Australian based publication, it is inevitable that the writing group would be predominantly Australian. It is interesting however that all 15 members of the Psychotropic Expert Group and all six of the Sleep Disorders Expert Group are Australian based. None-the-less, many of these experts would be well known in the psychotropic and sleep disorders fields. Apart from the field of psychiatry, there are experts from the fields of psychology, nursing and behavioural sciences,

and general practice. Psychotropic drug guidelines for New Zealand are given elsewhere.¹

Therapeutic Guidelines: Psychotropic is well researched, concise and consistent in its presentation. Chapters include "Getting to know your drugs", "Pertinent practical points", "Anxiety and associated disorders", "Sleep disorders", "Mood disorders", "Schizophrenia and related psychoses", "Behavioural emergencies", "Delirium", "Dementia", "Substance use disorders", "Personality disorders", "Eating disorders", and "Disorders usually first diagnosed in childhood and adolescence". There are also four Appendices, namely "Pregnancy and breastfeeding", "Patient resources and support organisations", "Sources of information and assistance" and "Clinical Institute Withdrawal of Alcohol Scale, revised (CIWA-Ar)". By far, the largest chapter is Chapter 1 "Getting to know your drugs" (pages 1-48). The drugs are discussed by sub-headings, namely "Mechanism of action", "???", "Pharmacological properties", and "Adverse effects". The drugs covered include Antidepressants, Drugs used in bipolar disorder, Anxiolytics and hypnotics, Antipsychotic drugs, Anticholinergic antiparkinsonian drugs, Drugs used to treat attention deficit hyperactivity disorder, Drugs used in substance use disorders, Drugs used in dementia, and Other drugs used in psychiatric illness. There is no set pattern to the structure of the chapters and sections in the guidelines, although most sections cover management in detail.

Version 6 is a major update of *Therapeutic Guidelines: Psychotropic*. There is an increased emphasis on how physical co-morbidities that commonly occur with psychiatric illnesses are managed and also what role non-pharmacological means may play in treatment. There is also an enhanced emphasis on the need for comprehensive treatment plans for disorders of childhood and adolescence. Several aspects that have seen a major revision include treatment of psychiatric illness in older persons and chronic disease, mood disorders, substance use disorders (p. 191-212), and behavioural emergencies. There is a useful table included on "Antidepressant-free intervals recommended when changing from one antidepressant to another" (Table 9, p. 112). From the Australasian perspective, it is hard to fault the guidelines, although a more obvious multidisciplinary approach could have been adopted. One possible omission for those

interested in travel medicine would be a discussion on issues connected with air travel clearance and medical retrieval. Another possible omission is that there is no special compilation of acute or chronic poisoning involving psychiatric consequences beyond the substance abuse disorders, which might be found in a larger textbook. None-the-less, it is a very useful rapid therapeutic guidelines reference.

Therapeutic Guidelines: Psychotropic is not a substitute for training and experience in psychotropic or sleep disorders medicine. It is also not meant to be a comprehensive textbook, especially as there have been several good textbooks published recently, for example, *Kaplan & Sadock's Comprehensive Textbook of Psychiatry*.² The handbook does however provide an exceptionally useful and fairly comprehensive clinical reference on most aspects of psychotropic medicine for the informed health professional, particularly those

who are working or will be working professionally in psychiatry, psychology, sleep disorders, hospital practice and general practice. The book will also appeal to general physicians and other health professionals who have an interest in psychotropic medicine, as well as students and academics involved in psychotropic training courses. *Therapeutic Guidelines: Psychotropic* has little competition in the guidelines field and is an important guidelines reference handbook in Australia.

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Essential Public Health: Theory and Practice*

Edited by Stephen Gillan, Jan Yates and Padmanabhan Badrinath

*1st edn. xiii +335 pp, paperback with illustrations and CD, ISBN 978-0-521-68983-0. Cambridge, Cambridge University Press, RRP AUD97.00, 2007.

Public health has done more than any other discipline to address global health issues and improve the standard of living and life expectancy, especially during the past 100 years. Today, we are fine tuning public health in many developed countries and most health professional courses now include a substantial component of public health training. At the postgraduate level, there are more than 20 postgraduate public health programs in Australasia alone, including those offered through the Centre for Military and Veterans' Health.¹ It is important therefore that a concise textbook is available that addresses the contemporary issues in public health. A new textbook, *Essential Public Health: Theory and Practice* is an important addition to the suite of textbooks available in public health. Not to be confused with *Essential Public Health Medicine*, last published in 1993,² or the more recently published *Essentials of Public Health*,³ *Essential Public Health* is ideally placed to be added to booklists of undergraduate and introductory postgraduate public health courses. It has a table of Contents, List of contributors, a Foreword by Professor John Danesh from the University of Cambridge, a second Foreword by Tony Jewell - Wales' Chief Health Officer, Acknowledgements, an Introduction, two main Parts, 17 Chapters, an epilogue, a Glossary and a comprehensive Index.

Essential Public Health is presented as an 18.5 x 24.5 x 1.5 cm paperback publication, which could easily fit in the briefcase or student's backpack. The textbook has a simple but attractive coloured cover. The back cover gives brief details of the book and of the editors. The stated primary aim of the textbook is "to capture both the art and science in the field". The stated target audience is "all those training in health care, social care and related disciplines such as environmental health". However, the book will appeal to all academic staff who co-ordinate and teach public health and related programmes, as well as students who are undertaking undergraduate courses in public health or introductory postgraduate public health courses. The textbook comes with a CD.

The two main Parts of *Essential Public Health* include "Part 1 The public health toolkit" and "Part 2 The challenges of public health in practice". The chapters in Part 1, written by the textbook's editors, include: 1. Demography; 2. Epidemiology; 3. Evidence-based health care; 4. Improving population health; 5. Screening; 6. Health needs assessment; 7. The health status of the population; 8. Health care evaluation; 9. Decision-making in health care; and 10. Health protection and communicable disease control. The chapters in Part 2, all written by external contributors, include 11. The health of children and young people; 12. Adult public health; 13. Public health and aging; 14. Tackling health inequalities; 15. Health policy; 16. Quality measurement and improvement in health care; and 17. International development and public health. The conclusion, entitled "Public Health - the future - be part of it", is written by David Pencheon. Each chapter has references, although no "further readings".

The two Parts of *Essential Public Health* are quite distinct. One recent review even suggested that *Essential Public Health* is really two books in one.⁴ Part 1 systematically describes important "tools" and principles of public health, which are core to the discipline. There is good use of tables and illustrations in this Part. Primarily, the CD complements this Part of the textbook, which has a number of self-directed learning questions associated with it. Health promotion, although not a named chapter, is a major component of Chapter 4 Improving population health. Part 2 has well selected contributions from practitioners in the field, which are deemed "essential"; however there will be many topics missing. These chapters help to put the principles from Part 1 into practice. Much is made in the various chapters of "lobbying and working with key stakeholders...to resolve problems" (p495),⁵ as pointed out in another recent review. However, there is no dedicated discussion concerning public health advocacy, community empowerment or how partnerships, consultations and negotiations with key stakeholders are developed, including the general public.

Each of the editors is from the United Kingdom (UK). Stephen Gillam is Director of Undergraduate Public Health Teaching at the Institute of Public Health, University of Cambridge. Jan Yates is a Public Health Specialist with experience of public health practice in Primary Care Trusts, as well as within acute hospital and mental health settings. Padmanabhan Badrinath is a Consultant in Public Health Medicine in the Suffolk Primary Care Trust. Of the 12 contributors, only one resides outside of the UK. It may be useful in future editions to have more contributors from other countries to further internationalise what is already a very useful textbook.

Essential Public Health is a useful introductory textbook in the field of public health and an ideal undergraduate teaching resource. It is a compact two-in-one textbook, which covers both the principles and the practice of public health. This first Edition of *Essential Public Health: Theory and Practice* is creditable effort and is sure to gain entry into the relatively competitive market of public health textbooks, especially with the University of Cambridge Press behind it.

Reviewed by: Peter A Leggat, MD, PhD, DrPH, FAFPHM, FACTM, FACRRM, Professor and Head, School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville, Queensland, 4811, Australia

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1. University of Queensland, Centre for Military and Veterans' Health. Homepage. URL. <http://www.uq.edu.au/cmvh/> (accessed 07 February 2009)
2. Donaldson, RJ, Donaldson LJ. *Essential Public Health Medicine*. London: Kluwer, 1993 (Reviewed BMJ 1994; 309: 280).
3. Turnock BJ. *Essentials of Public Health*. 1st edn. Boston: Jones and Bartlett Publishers, 2007
4. Lewis S. Book Review: *Essential Public Health: Theory and Practice*. J

1. Purpose and scope

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

Editorial Office

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Submission of manuscripts

Electronic submission of manuscripts is mandatory.

Manuscript requirements

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

2. Categories of manuscripts

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

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

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

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

Instructions to Authors

Original research

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

Short communications

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

Review articles

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

Reprinted articles

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

Case studies

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

Abstracts from the literature

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

Letters to the Editor

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

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

Editorials

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

Biographies

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

History

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

Obituaries

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

Instructions to Authors

Book reviews

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

Commentary

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

A view from the front

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

3. Editorial policy

Original material

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

Disclaimer

The articles and opinions expressed in this journal are those of the authors, and should not be taken as reflecting official government policy. While the Editorial Board makes every effort to ensure that no inaccurate or misleading data, opinions or statements are published in the journal, all data, results and opinions appearing in articles and advertisements are the responsibility of the contributor/s and/or the advertiser concerned. Accordingly the Editorial Board and their respective employees, officers and agents accept no liability whatsoever for the consequences of any such inaccurate or misleading data, results,

opinions or statements. While every effort is made to ensure that all data are accurately presented, new methods and techniques should only be considered in conjunction with published literature from manufacturers.

Ethics approvals

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

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

Confidentiality

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

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

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

Informed consent

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

Authors Process form

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

Instructions to Authors

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

Copyright assignment

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

Conflict of interest and funding

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

Authorship and acknowledgments

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

Sole submission

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

Peer review

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

Offprints

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

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Clinical trial registration

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

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

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

Registries that meet these criteria include:

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

Instructions to Authors

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

Language

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

Review process

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

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Software and format

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

4. Organisation of manuscripts

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

informative headings and sub-headings related to the content.

Title page

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

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

Abstract

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

Conflict of Interest

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

Introduction

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

Materials and methods

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

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

Results

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

Discussion

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

Acknowledgements

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

References

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

Tables (including legends to tables)

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

Illustrations

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

5. Preparation of manuscripts

Style

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

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

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

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

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

Tables

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