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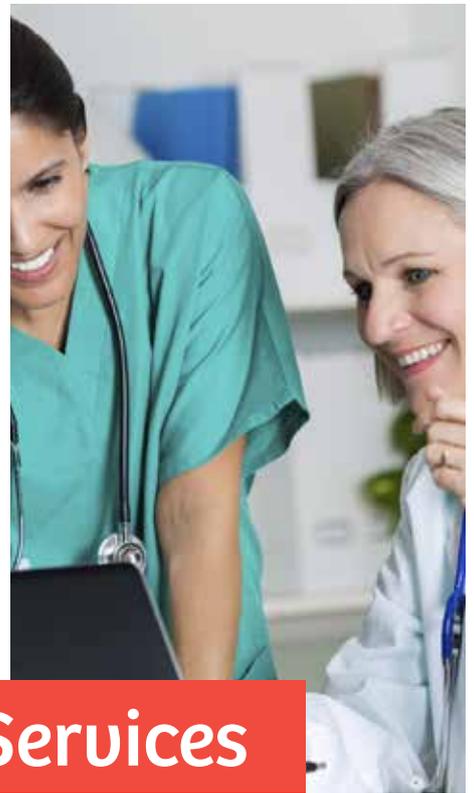
Journal of Military and Veterans' Health



- A Commentary: Rethinking Approaches to Resilience and Mental Health Training
- Risk of Suicide Among Veterans with Traumatic Brain Injury Experiencing Homelessness
- The Army Malaria Institute: Fifty Years of Esteemed "Vampire" Service

The Journal of the Australasian Military Medicine Association





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Front cover: 2GHB’s ambulances sit patiently waiting, on a cold Cultana night. Ex Hamel 2016
Photo Courtesy of Murray Hayes

Journal of Military and Veterans' Health

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STATEMENT OF OBJECTIVES

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

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

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

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Editorial

Seventy-five years on

On 19 February 1942, Darwin was bombed in the largest single attack by Japan on Australia. The first of more than 100 air raids on Australia, which included further attacks on Darwin, Broome, Townsville and Port Hedland over the next two years, this attack involved 242 Japanese aircraft, in two separate raids, targetting the town, the 65 ships in Darwin's harbour and the town's two airfields. Nine ships were sunk, including the *USS Peary* and *HMAS Mavie*, and an estimated 243 people died in the raids, although this figure is disputed, with claims of up to twice that number. A recent song by Garth Porter and Colin Buchanan, "When the first bombs fell", captures the key events of that day.¹

The hospital ship, *HMAHS Manunda*, was damaged despite prominent Red Cross markings, with 12 members of the ship's crew and hospital staff killed and 19 seriously injured. Despite the damage and casualties, *Manunda* acted as a casualty clearing station for injured personnel from other ships. Major Clara Shumack (Matron Shumack) was awarded the Royal Red Cross for her exceptional devotion to duty during the attack. *Manunda* sailed late on 20 February with casualties onboard for Fremantle.

HMAHS Manunda was originally built as a coastal passenger vessel in Dalmuir, Scotland. Finished in 1929, she sailed between Australian ports until she was converted into a hospital ship in Sydney in early 1940 and entered service as *HMAHS Manunda* on 22 July 1940. The general hospital based on board was commanded by Lt. Col. John Beith, and staffed with

members of the Australian Army Nursing Service. Between November 1940 and September 1941, she served in the Middle East and Mediterranean before being dispatched to Darwin. After Darwin and refit, she was based primarily in Milne Bay in Papua New Guinea, where she acted as a floating hospital for the Allied forces and made 27 voyages from Milne Bay to Brisbane and Sydney to transport wounded troops. During the war, she carried approximately 30,000 casualties to safety.

Our first issue of 2017 addresses a range of diverse areas. Mental health resilience, risk of suicide in homeless veterans and diagnosis of depression in female veterans is addressed in three excellent articles. There is also a focus on clinical governance and occupational health, with articles and letters to the editor looking at these areas. Finally, there are two interesting historical perspectives, one on logistics in the Falklands war and another on the Army Malaria Institute.

We continue to get a good range of articles, but other military and veterans' health articles are always very welcome and we would encourage all our readers to consider writing on their areas of military or veterans' health interest. Our themes are now available for both 2017 and 2018 to allow for authors to research and develop their articles – we certainly welcome articles in these areas but welcome any articles across the broader spectrum of military health. We would also encourage authors who are preparing to present at the AMMA Conference in October to consider writing up their presentations early for publication in the Journal.

Dr Andy Robertson, CSC, PSM
Commodore, RANR
Editor-in-Chief

Reference:

1. Kernaghan, L. Spirit of the ANZACs. ABC: 2015.

Personal Observations: Report on the 4th ADF Environmental and Occupational Health (EOH) Conference, Brisbane, March 2015

Commander Neil Westphalen

Dear Editor,

The JMVH article by Licina et al, reporting on the 4th Australian Defence Force (ADF) Environmental and Occupational Health (EOH) Conference in Brisbane in March 2015¹, merits the following observations.

The article initially refers to a range of future challenges in the Asia-Pacific region, such as climate change, environmental degradation, political instability and terrorist threats, as well as poverty, population displacement, infectious disease, potable water shortfalls and inadequate sanitation. It also refers to the increasing incidence of lifestyle-related conditions in the region, such as cardiovascular disease, cancer and diabetes.

However, none of these otherwise important public health issues directly pertain to what should be one of the primary roles of the ADF's health services: ensuring the occupational and environmental health-related employability and deployability of ADF personnel.

The article then asks how these challenges will affect what it refers to as the 'EOH profession', with respect to disaster relief and public health for local civilian populations, and force protection for deployed ADF personnel. It also describes how the United States is building regional partnerships via activities such as PACIFIC PARTNERSHIP, and how ADF EOH practitioners can contribute.

However commendable these aspirations, their scope remains limited to deployable ADF public health (as opposed to OEH) services, either as primary mission components in their own right, or as force protection enablers for ADF operations.

Next, the article refers to the development of a JHC concept paper for the Defence Work Health and Safety Committee (DWHSC), to outline options

to support the ADF's Occupational Medicine/Occupational Hygiene (OMOH) Project. It notes that some OMOH capability shortfalls were first exposed by Comcare seven years ago, during its investigation that resulted in its Hazardous Chemical Enforceable Undertaking in 2010², while others had been identified a further eight years ago, at the 2001 F-111 Deseal/Reseal Board of Inquiry³. The article also refers to the lengthy development period of other JHC initiatives, in particular Health Manuals 20 (*Preventive Medicine*) and 21 (*Pest Control*), the scopes of which are arguably also limited to deployable ADF public health services.

The article then lists a series of key points as outcomes from the following panel discussions:

Strategic perspectives from senior officials and policy perspectives on how Service EOH is supporting Defence requirements;

- EOH on exercise and deployment;
- EOH in garrison operations and academia, and
- Health surveillance informing health intelligence

I note that the key points raised per each of these panel discussions considered only some of the Fundamental Inputs to Capability (FICs) required to sustain an ADF EOH capability⁴.

Finally, despite highlighting the extended timeframes that some of the conference topics remain outstanding, the article refers to the 'reassuring' level of motivation to find common solutions, and the need to properly resource 'the EOH community'.

In short, the conference topics continued to perpetuate the view that the scope of military occupational and environmental health is limited to managing the public health hazards associated with

ADF deployments. This misperception stems from flawed assumptions (extending throughout military history), regarding the functions and roles of military health services. The latest Australian iteration of these assumptions arguably began with the performance audit report by the Australian National Audit Office (ANAO) in 1997⁵, which indicated that:

- ADF personnel only require clinical treatment services, and
- The sole justification for uniformed ADF health personnel stems from the requirement to provide clinical treatment services while deployed

Both of these assumptions fail to address any other functions and roles of military health services, such as (in this case) occupational and environmental health. The anecdotal high incidence of ADF workplace illness and injury (in particular musculoskeletal injuries and mental health issues), suggests the need to better manage *all* the occupational and environmental hazards associated with *all* ADF workplaces (deployed *and* non-deployed), with more emphasis on prevention rather than treatment.

In support of these assertions, the Australian Faculty of Occupational and Environmental Medicine (AFOEM) website indicates that occupational medicine takes a preventative approach to workplace health as follows⁶:

- Firstly, considering how workplaces affect employee health. It is suggested that the scope of this task in the ADF context is far broader than the topics raised at this Conference: even in the 'garrison' setting, the ADF arguably constitutes one of the largest, most hazardous and complex workplaces in Australia^{7,8}.

Despite this, unlike other Australian employers (including the Public Service), the ADF via JHC appears to remain unique in Australia, in that it provides health care for its employees without ascertaining whether or not any of the clinical presentations are work-related. Furthermore, at present JHC does not collect work-related illness/injury data, or record lost time or restricted duties, or identify the health care costs resulting therefrom.

This baseline information is not only essential for monitoring the effectiveness of the ADF's OEH services: it also facilitates accounting for the high cost of providing health care for a fit young working-age medically-selected population, as well as the high health care and compensation costs incurred by DVAS for current and ex-serving ADF personnel⁹.

- Secondly, considering how an employee's health can affect their ability to work. The relevance of this task in the ADF setting is based on the requirement to ensure that commanders, managers and supervisors are adequately informed of the health status of their personnel. It is conducted in accordance with the Temporarily Medically Unfit (TMU) process, the ADF Medical Employment Classification (MEC) system^{10,11} and the relevant single-Service references where these exist^{12,13}.

However, personal experience of managing sickbays ashore and afloat for 14 of my 29 years in the permanent Navy indicates that:

- 'Garrison' MOs are unable to assess medical suitability for employment/deployment unless they fully understand what their patients actually do in their workplace, and

Acquiring this understanding takes full-time neophyte Service and civilian health practitioners 12 months; part-timers take longer and it simply doesn't happen for itinerant sessional personnel who lack prior Service experience.

These assertions are supported by evidence indicating that medical certification of fitness for work can be challenging for civilian GPs for a number of reasons, including:

- The doctor-patient relationship;
- The GPs patient advocacy role;
- Consultation time pressures;
- Lack of occupational health expertise; and
- Lack of knowledge of the workplace^{14,15}

These reasons are compounded by further evidence indicating that at least some civilian GPs do not accept their responsibilities with respect to how they manage long-term work absence, work disability and unemployment^{16,17}.

Moving on, the AFOEM website also indicates that environmental medicine considers the human health impacts of industrial practices on the broader environment. I simply note recent media articles that highlight the importance of this issue for the ADF in its base settings, and their co-located civilian communities within Australia^{18,19,20,21}. These articles confirm that the scope of military environmental medicine is far broader than that indicated at this conference.

It therefore seems reasonable that, as a (military) health service that ostensibly provides health care for a (military) workforce in a variety of (military) workplace settings, the ADF's health services should be based on an OEH delivery model. Among other attributes, such a model would entail a combination of Service and civilian occupational and environmental physicians (OEPs) as well as GPs and other health professionals. These need to collaborate in both the 'garrison' and operational (not just 'deployed') settings, not only regarding health policy development, but also providing clinical primary and other health care for ADF employees.

The current state of the ADF's OEH services suggests that implementing such a model would take at least 10-15 years of sustained effort. It therefore seems unfortunate that the 4th ADF EOH Conference continued to limit the perceived scope of military occupational and environmental health, to managing the public health hazards found in many – but by no means all – ADF deployed settings.

Even so, I trust this letter will be considered a constructive contribution to the eventual development of a truly holistic health care model for the ADF.

Such a model would facilitate ADF operational capability by being premised on supporting a military workforce, who perform their duties in a wide range of, at times, extraordinarily demanding operational and non-operational workplaces.

This model would also require all ADF health staff to become military 'OEH professionals', each within their area of expertise, irrespective of whether or not they wear a uniform.

Yours Sincerely

N Westphalen
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- 6 Australasian Faculty of Occupational and Environmental Medicine. [online] <https://www.racp.edu.au/about/racps-structure/australasian-faculty-of-occupational-and-environmental-medicine> [2016, 22 Jul]
- 7 As of Sep 15, the ADF consisted of 57,982 permanent and 45,398 active and standby Reserve personnel. Of these only 2,241 were deployed. Non-deployed personnel work at 60 major bases and many other facilities throughout Australia. These numbers do not include Defence civilian public service or contractor personnel. See Australian Defence Force [online] https://en.wikipedia.org/wiki/Australian_Defence_Force [2016, 22 Jul]

- 8 The Defence recruiting website lists 214 different jobs across all three Services: see online at <http://www.defencejobs.gov.au/recruitment-centre/job-finder> [2016, 22 Jul]
- 9 As of 30 Jun 15, Australia had an estimated 339,000 veterans, including about 150,200 with peacetime-only service between 1972 and 1994. Of these 339,000 veterans, 208,181 (61.4%) were in receipt of health care services for Service-related conditions (white and gold cards) from DVA. The net cost of these health care services was \$5.525b. Non-health compensation and disability DVA costs came to another \$3.220b. See DVA Annual Reports 2014-15. [online]
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Military Personnel and Psychological Support: An Analysis Based on Social Representation Theory

V. Karamanoli, K. Papachristopoulos

Background: Seeking mental help in military contexts seems to be the last choice for those who have psychological problems among military personnel. Personal and interpersonal factors are associated with the perception of stigma concerning seeking mental help, especially in the military, and research on potential barriers regarding the search for psychological help can provide useful conclusions for military services.

Purpose: The present research aims, by utilising Social Representation Theory, sought to capture military trainees' different levels of concepts and constructs relating to the search for psychological support in the military.

Material and Methods: Participants, military trainees (N= 143) recorded their free associations concerning psychological help and the data provided were analysed according to the structural analysis model of social representation. Data analysis was conducted by utilising the content analysis method, and the corresponding criteria of frequency and rank of appearance.

Results: The central core that emerged by the social representation fell into the following categories: a) problems that military personnel face in the military environment, or outside it, and possibly leading to psychological problems and b) the efficacy of psychological support to members of the military services .

Conclusions: a) the structure of social representation differs based on the role and hierarchy of military personnel, b) the lack of military virtues appears to be a component of the social representation at different levels based on the military hierarchical thesis, c) Stigmatisation of the search for psychological support in the military is a component of the periphery. These results can provide concrete suggestions for psychological services in the military.

Keywords: military personnel, stigma, psychological help

Introduction

Military personnel undertake duties with high risks which might often cause exposure to traumatic stimuli¹ and are associated with mental health problems affecting a person's occupational functioning and the organization's performance.² Although military personnel are at high risk of mental health problems, research findings indicate that military personnel and veterans do not seek needed mental health care since stigmatizing beliefs about seeking help for mental health problems are commonplace among military personnel.^{3,4} Holding such beliefs may influence the decision to seek help, particularly when social position and relationships with colleagues may be adversely affected.⁵ Thus, it is critical for the research of military psychology to

identify factors that interfere with the use of mental health services for this population, and where possible, intervene to reduce barriers to care.

Military services members tend to refrain from seeking psychological help as in this way they manage to avoid being characterized as ill and feeling embarrassed.⁶ Military personnel and veterans, even if they suffer from psychological problems, do not seek help⁷, since seeking mental help on several occasions seems to be the last choice for those who have psychological problems in the army.⁸ According to research only a percentage of 38-45% of the military personnel and marines who scored high on indication of mental difficulty exhibited willingness to seek mental help.⁹

Military personnel often have a self-perception of an elevated sense of power and by experiencing symptoms of mental discomfort and mental disorder they may frequently be associated with a sense of weakness and emotions of shame.¹⁰ Research has illustrated an important mediation concerning public stigma and the willingness to seek help. It is self-stigma that might mediate the relationship between perceived public stigma and attitudes toward seeking help as well as a willingness to seek help.¹¹ Public stigma affects the decision to seek help and may have as much or more to do with the internalisation of societal messages about what it means to be mentally ill¹² or to seek psychological services. According to Vogel the internalisation can lead to shame and loss of self-esteem¹³, and the attempt to avoid those feelings may have the most direct effect on individual attitudes toward and willingness to seek counselling.¹¹ Research has shown a significant relationship between shame and avoiding treatment.⁶ Participants who expressed a sense of shame from personal experiences with mental illness were less likely to be involved in treatment while family shame was also a significant predictor of treatment avoidance in the same study.¹⁴ Social representations of mental illness could influence and reduce the image of self, self-esteem and the perception of self-efficacy.^{15,6,16}

One of the major obstacles related to reluctance of seeking mental help is a perception of stigma, which is defined as “a barrier that discourages individuals and their families from seeking help”.¹⁷ A long-standing stigma associated with having mental health problems is particularly strong and makes addressing mental health issues more difficult for people in the military culture. We need to underline the fact that personnel wishing to pursue a military career face additional restraints for fear of being taxed with having a mental health problem that could impede career progress and with lacking confidentiality.¹⁸

Three key contexts that promote stigma can be delineated: *institutional, public, and self*. Institutional stigma has been defined as arising from the “policies of private and governmental institutions” that either intentionally or unintentionally “restrict opportunities [and] hinder the options of people with mental illness”.¹⁹ Public stigma reflects the knowledge, attitudes, and beliefs about mental health treatment and the prejudicial and discriminatory behaviours described above, coming from friends, family, co-workers and the public. Public stigma for seeking mental help is associated with the perception that the person who seeks help is undesirable²⁰, or that he/she is perceived as “crazy”. Together,

the institutional and public contexts make up the broader military context. Self-stigma is most commonly defined as the “internalisation of public stigma” and was often associated with a “loss of self-esteem and self-efficacy”.²¹ Recent research suggests that stigma at the individual level mediates the relationship between negative attitudes, beliefs, and behaviours of the public and attitudes toward and intentions to seek help and treatment^{22,23} and other research suggests that women are more likely to seek professional help than men.¹

This research aims to study the social representations for different categories of military personnel to whom psychological support applies (soldiers in the unit, trainees in the military school, military officers). The method is the structural approach of social representation as developed by Vergès.²⁴ Social representations which permit the apprehension and interpretation of social reality²⁵, are collectively constructed consensual forms of thinking, shared by the members of a social group.^{26,27} According to Abric²⁸ social representations are cognitive organizations. Rouquette & Rateau consider social representations as sub-systems of a wider ideological system which can define other narrower sub-systems like attitudes.²⁹

Social representation theory maintains that social psychological phenomena and processes can only be properly understood if they are seen as being embedded in historical, cultural and macro social conditions. A social representation can be conceptualised as a system of values, ideas and practices that function as the means to establish an order which will enable individuals to orient themselves in their material and social world and to enable them to communicate.³⁰ The concept of social representation can be seen as a tool for studying the “organisation of common knowledge”³¹ with words as indicators and two components are integrated into the representation: a cognitive and a social one.³² Social Representation research attempts to overcome the shortcomings of those currently widespread theories and approaches in social psychology which are based on methodological individualism and on an epistemology which functionally separates the subject from the object.³³ Thus, social representation researchers observe talk and action which is related to a social phenomenon or object and contrary to social cognitive approaches, it is presupposed that an object is social not by virtue of some immanent characteristics, but by virtue of the way people relate to it. Hence, according to Moscovici, subject and object are not regarded as functionally separate but a person or a group behaviour puts the object in the context of the subject’s activity.³⁰ In other words, for

an object to figure in a group's world, i.e. to be an object for a group, it must be socially represented. As a consequence, social representation theory is a social constructivist as well as a discursively oriented approach.³⁴

Given the above theoretical background, the present study is aimed to capture the thought of military trainees about seeking psychological support in the military. Precisely, the study aims to investigate the presence of representational differences concerning a) a soldiers' seeking of psychological support in the unit, b) military trainees' seeking psychological support in military school, c) military officers' seeking psychological support. The main research questions focus on the core element of social representations concerning psychological help in the army and potential differences on how military students conceptualise psychological help on different contexts (soldiers in the unit, trainees in the military school, military officers).

Hypotheses

H1. The structure of military trainees' social representation concerning the search for psychological support in the military could be different depending on the role, the level of the hierarchy, the responsibilities of military personnel and the duties of the military personnel.

H2. Lack of military virtues, which constitute the core of military identity, is expected to differ according to the military personnel that constitute the object of the representations.

H3. Although seeking psychological support should be associated with Stigmatisation, military personnel don't refer to it and therefore it is not expected to be included in the central core of the representations.

Methodology

Participants

Participants were 143 military male students from Greece (N=143) randomly selected, aged 18-21 years old. Thirty seven of the participants aged 18 years old were students of the 1st year (25.7%), 36 of them aged 19 years old studying at the 2nd year (25%), 33 of them aged 20 years old studying at the 3rd year (23%), and 38 of them were aged 20 years old studying at the 4th year (26.4%).

Initially, an official consent about research procedure was delivered as provided. The data regarding military trainees' representation of seeking psychological help in the military for three groups

(military trainees, soldiers in the unit and military officers) were collected using the method of free associations according to the structural model of the representation.²⁴ Participants were instructed in Greek to write down the first three words that come to mind when hearing the following phrases:

a) "*Psychological support in the unit*", b) "*Psychological support in a military school*", c) "*Psychological support for military officers*".

Data analysis was conducted based on the method of content analysis which allows the categorization and the quantification of participant's free association.^{35,36} A system of categories was developed following the criteria of exhaustive, exclusiveness, homogeneity, objectivity, fidelity, competence, productivity. Two researchers, separately and simultaneously, developed a categories' system in order to adhere to the criteria of objectivity. These two categorisation systems were compared with each other and a joint way was commonly decided.

A system of 10 categories was developed in Greek for all three following representations: i) *problems* (difficulty, pressure, financial problems, personal problems etc.), ii) *emotions* (homesickness, melancholy, loneliness, stress, monotony, fear etc.), iii) *positive evaluation and results* (help, useful, necessary) iv) *lack of military virtues* (weakness, lack of adjustment, impotence, etc.), v) *stigma and consequences* (stigmatising, taboo, marginalisation, devaluation etc.), vi) *mental illness* (crazy, madness, mentally ill etc.), vii) *psychological terminology* (psychology, doctor, medications etc.), viii) *devaluation of mental health service* (useless, flavourless, strange, symbolic etc.), ix) *military terminology* (unit, soldiers, commander, military, viewpoint etc.), x) *process of psychological help* (dialogue, communication, questions, support etc.), xi) *other* (unknown, perhaps, coexistence etc.). Afterwards the data and the categories were translated into English and a bilingual researcher translated them vice versa in order to confirm the accuracy of translation.

After content analysis was conducted, we proceeded to a structural approach of military trainees' social representations of "psychological help": a) to soldiers in the unit, b) to trainees in the military school, and c) to military officers" by applying Vergès's method.²⁴

This specific method relies on the juxtaposition of two criteria: a) the frequency of the specific category, and b) the rank of its appearance, indicating that a word belonging to a specific category is the 1st, 2nd, or the 3rd association proposed, so the important and

salient elements of the examined representations are identified. The mean frequency and the mean rank of appearance were calculated. All categories with a frequency higher than the mean frequency are regarded as major elements of the representation. All categories with a rank of appearance lower than the mean rank are regarded as strong elements. The categories were then cross-tabulated in a 2x2 matrix. In the top left cell the elements of both high frequency and strong rank of appearance are presented. Those elements compose the central core of the examined representations. The bottom right cell includes rare elements of high rank and identifies the peripheral elements of the representation. In the top right cell the elements of high frequency are presented and low rank in the bottom left cell present the elements of low frequency and high rank of appearance, which indicate the dynamic zone of the representation that is, the zone susceptible to change and evolution.

Results

Structure analysis of participants' free associations on the three themes proposed by the research led to three tables which indicated the core, the periphery

and the dynamic zone of the military trainees' representation about psychological support in the military.

In respect of the psychological support provided to soldiers in the unit *positive evaluation of mental health service and results, problems and lack of military virtues* compose the central core of the social representation (see table 1). More precisely, the category of *positive evaluation of mental health service* that was represented by words such as *help, very good help, support, correct, excellent, necessary* was found to be the most frequent (141) and the strongest (1.67) category of this representation. The category *problems* represented by words such as *oppression, difficulty, problems, tiredness, compulsion* is frequent (64) and strong (1.85). Also the category *lack of military virtues* represented by the words *impotence, unsuitability, shirker, lack of adjustment*, is frequent (41) and quite strong (1.90).

Stigmatisation and consequences are found to be in the periphery of the social representation "psychological support for soldiers in the unit" as well as the categories named "devaluation of mental health service", "military terminology", "emotions",

Table 1: Military trainees' representation of psychological support in the unit: stigma is considered as a narrow category (N=143)

		UNIT	
		RANK	
		< 1.91	≥ 1.91
F R E Q U E N C Y	>39	Positive evaluation of mental health service and results : 141 (1.67) Problems : 64 (1.85) Lack of Military virtues: 41 (1.90)	
	≤39		Devaluation of mental health service: 34 (1.92) Military terminology: 34 (1.92) Emotions: 20 (1.95) Process of psychological support: 23 (1.95) Mental illness: 14 (1.97) Stigma and consequences: 12 (1.97) Psychological terminology: 10 (1.98)
		Mean frequency for all 10 categories: 39 Mean rank for all 10 categories: 1.91	Other : 13 No responses : 23 Total : 429

“process of psychological support”, and “psychological terminology”. More precisely the category of *Stigmatisation and consequences* represented by the words *humiliating, taboo, stigmatised, discrimination* is not so frequent (12) and seems to be weak (1.97). As far as the category of psychological terminology is concerned, it is represented by the words *psychology, doctor, phone line, psychologist, psychiatry*, is more rare (10) and weak (1.98). Words like *useless, symbolic, waste of time, waste of money* are included in the category *devaluation of mental health service* 34 times with mean rank 1.92. Words like *unit, soldiers, hazing, military, order, commander, service of soldier, duty, lieutenant, outpost, viewpoint, captain*, are composing the category *military terminology* 34 times with 1.92 mean rank of appearance. Words like *disappointment, pain, melancholy, stress, shame, bitterness, loneliness*, represent the category *emotions* 20 times with 1.95 mean rank of appearance. Words like *dialogue, trust, questions* are representing the category *process of psychological help* 23 times with 1.95 mean rank of appearance. Finally, words like *mentally ill, mental illness, crazy, craziness* represent the category *mental illness* 14 times with 1.97 mean rank of appearance. A remarkable comment to be made is that social representation’s dynamic zone has no elements, a sign of the stability of the social representation.

Results concerning military trainees’ social representation about psychological support in military schools attest that the central core of the social representation is composed of items belonging to the categories *positive evaluation and results, difficulty, psychological terminology, devaluation of mental health service* (see table 2). The category of *positive evaluation and results* of psychological support in military school includes words such as *improvement, solution, mental recovery etc.* which are both most frequent (109) and most strong (1.75) and therefore constitute the central core of the representation, along with the category *difficulty* which has high frequency (48) and low rank of appearance (1.89) including words such as *problems, difficulties, deadlock, pressure, oppression etc.* Moreover, categories *psychological terminology* and *devaluation of mental health service* are constituent elements of the central core with relatively high frequency (43) and the same rank of appearance (1.90). This category is composed by words such as *doctor, psychologist, psychiatrist, sanatorium, psychoanalysis, line of psychological support* and words concerning their psychology lectures: names of teachers, professors, lessons, lectures, methodology.

The remaining categories appear in the periphery, namely *lack of military virtues, mental illness, emotions, stigma and consequences, process of psychological help* and *military terminology*, in a way that no dynamic zone is recorded in this social

Table 2: Military trainees’ representation of psychological support in the military school: stigma is considered as a narrow category (N=143)

		MILITARY	SCHOOL
		RANK	
		< 1.91	≥ 1.91
F R E Q U E N C Y	>40	Positive evaluation and results: 109 (1.75) Problems: 48 (1.89) Psychological terminology: 43 (1.90) Devaluation of mental health service:43 (1.90)	
	≤40		Lack of Military virtues: 32 (1.93) Mental illness: 28 (1.94) Emotions: 25 (1.94) Stigma and consequences: 22 (1.95) Process of psychological support: 21 (1.95) Military terminology: 15 (1.97)
		Mean frequency for all 10 categories: 40 Mean rank for all 10 categories: 1.91	Other : 25 No responses:18 Total : 429

representation. *More precisely, lack of military virtues* (frequency:32, rank of appearance 1.93) appear in the representation with words such as: *lack of durability, unsuitability, lack of confidence, lack of adjustment, weak, weakness, useless, giotas* (meaning without military qualifications), *collapse etc.* While *mental illness* (frequency: 28, rank of appearance 1.94) appear with words like *ill, illness, hospital, crazy, mad etc.* *Emotions* (frequency: 25, rank of appearance 1.94) are represented with words such as: *homesickness, pain, fear, stress, love, compassion, insecurity, sadness etc.* *Stigma and consequences* (frequency: 22, rank of appearance 1.95) are represented in the representation by words like *taboo, ridicule, marginalisation, discrimination, expulsion etc.* *Process of psychological help* (frequency: 21, rank of appearance 1.95) is presented in the representation by words like *discussion, communication, honesty, questions, interview, optional etc.* Finally, *military terminology* (frequency: 15, rank of appearance 1.97) is represented by words like *military, BSE* (meaning basic military education), *ASEI* (meaning high military schools), *414* (meaning military psychiatric clinic), *war, class of command, aces* (meaning students in the first class). It is interesting that no dynamic zone is observed in this representation and the stability of this representation could be interpreted with consideration of the stability of their opinion about themselves and their abilities.

Results indicate that the central core of trainees' social representation about psychological support for military officers is composed by the following

categories: a) *positive evaluation and results* (frequency: 152, rank of appearance 1.65) with words like *improvement, relief, support, positive, effective etc.*, b) *problems* (frequency: 70, rank of appearance 1.84) with words *helpless, duty, responsibilities, career, tiredness etc.* Dynamic zone is composed by categories a) *emotions* (frequency: 37, rank of appearance 1.91) (*i.e. pressure, stress, despair, indignation, compassion*) and b) *lack of military virtues* (*i.e. failure, weakness, unmilitary, impotence/* frequency: 27, rank of appearance 1.95). The periphery of the social representation is composed by the following categories: a) *devaluation of mental health services* (frequency: 35, rank of appearance 1.92) with words such as *unnecessary, ridiculous, funny, mockery etc.*, b) *mental illness* (frequency: 20, rank of appearance 1.95) with words like *complex, mad, crazy etc.*, c) *psychological terminology* (frequency: 13, rank of appearance 1.98) with words like *psychology, psychologist, psychiatrist, medicine etc.* d) *stigma and consequences* (frequency: 11, rank of appearance 1.97) with words like *taboo, discrimination, stigmatised, disgrace etc.*, e) *process of psychological support* (frequency: 8, rank of appearance 1.98) with words like *free psychologist, confidence etc.*, and f) *military terminology* (frequency: 6, rank of appearance 1.99) with words like *lieutenants, officers, free of duty etc.* (see table 3).

Discussion

Empirical knowledge of mental health-related beliefs that serve as barriers to mental health service use is critical to inform ongoing efforts to reduce

Table 3: Military trainees' representation of psychological support for military officers: stigma is considered as a narrow category (N=143)

		MILITARY	OFFICERS
		RANK	
		< 1.91	≥ 1.91
F R E Q U E N C Y	>36	Positive evaluation and results: 152 (1.65) Problems: 70 (1.84)	Emotions: 37 (1.91) Lack of Military virtues: 47 (1.95)
	≤36		Stigma and the consequences: 11 (1.97) Mental illness: 20 (1.95) Devaluation of mental health service: 35 (1.92) Psychological terminology: 13 (1.98) Process of psychological support: 8 (1.98) Military terminology: 6 (1.99)
		Mean frequency of all 10 categories: 36 Mean rank of all 10 categories: 1.91	Other : 14 No responses : 36 Total : 429

barriers to care within military personnel. According to the results of this research the central core of military trainees' social representation about the psychological support in military environment falls into the categories: a) problems that military personnel face inside or outside the military environment, and may cause psychological problems and b) efficacy of psychological support in the military.

It is observed that within the central core of the social representation appear not only the problems that may lead someone to seek psychological help, but also the positive evaluation and the results of the mental health service in the military for all three populations surveyed. The acknowledgment of mental health's service value by putting the category of *positive evaluation of mental health service and the results* represented by words like *help, very good help, support, correct, excellent, necessary* is a very interesting result and seems congruent with the results of previous research which indicates that military personnel's burden of seeking psychological support is fear of self and public stigma.³ Nevertheless, recognition of mental health services' efficacy fully mediates the relationship between fear of stigma and attitude towards the seeking of mental help.³

The central core of military trainees' representation for psychological help in the military school includes notions related to devaluation of mental health services. This result, along with the presence in the central core of the notions related to recognition of mental health services's efficacy create an obvious contradiction. It seems that military trainees may conceptualize seeking psychological help as a sign of military disability during their ongoing development of "new" social identity as military personnel.

They are trained under high pressure to enhance their psychological hardiness but this process is not yet completed, thus creating a contradiction about military virtue of strength and the reality of several problems to be transcended. Hence, the representation of a useless service of psychological support may help them to strengthen their military identity. They may believe that psychological support is not connected to military virtues since it is a common belief among them that problems they are confronted with are part of their reality trying to be strong and militarised.

Congruent to the interpretation that the representation of military trainees is related to their military identity is the fact that the category *lack of military virtues* belongs to the central core for the soldiers seeking psychological support, who have less military education compared to military trainees

and they are not prepared to be military personnel, so they are not militarised enough. In addition, the fact that in the category *lack of military virtues* is found to be the dynamic zone of the social representation concerning officers' seeking psychological support, and could be interpreted as a sign of military incompetence for an officer.

An interesting result is that mental illness which in the past was the main reason for someone to seek psychological support, in the representation for military personnel who seek psychological support is presented in the periphery of all three military populations. It forces us to reconsider the main role that the military environment plays and potentially the importance that other elements have in such an environment (i.e. *lack of military virtues*).

Items indicating devaluation of mental health services are in the periphery for soldiers and officers. These results about differentiation of the structure of social representation depends on the role of military personnel to confirm the 1st hypothesis of the study. The main conclusions derived by this contradiction are that: a) the acceptance that adjustment to military environment is difficult and any member of the staff could utilise psychological help in order to handle this situation, b) military trainees could more easily accept that other military personnel should need psychological help but not themselves. This conclusion is drawn since category "*devaluation of mental health services*" is recorded in the central core of the representation about seeking psychological support in the military school. Images of self-perception of power, of capability to confront and cope with all the problems on their own, of high self-esteem and high self-confidence that build the image of the capable military official may mediate this representation.

Lack of military virtues is a) in the central core for soldiers who seek psychological support in the unit, b) in the dynamic zone for officers who seek psychological support, and c) in the periphery for military trainees. It is obvious that lack of military virtues differs according to the military personnel and which consist of the object of the representations, confirming our 2nd hypothesis.

Stigmatisation is presented in the periphery for all three categories, as expected, since stigma as a notion is not very popular in military personnel, confirming the third (3rd) hypothesis of this study. This common indication for all three representations makes us believe that this result should be investigated in future research by considering the content of military stigma concerning those

seeking psychological support and not only its representation. It would be interesting to investigate the causes of stigma, its frequency, its correlation with other personality or emotional variables, such as narcissism, obsession, anxiety, optimism etc.

The limitations of this study are that: a) participants were only military trainees, thus the results may not be generalized to all service members in Greece, so it would be useful for future research to be addressed to other military personnel also, b) the way the questions of the free association were structured couldn't produce results that clearly concern the image of the person who seeks psychological help in the military. Perhaps future research should illustrate issues of self-stigma representations which could involve issues of self-image, self-esteem and the perception of self-efficacy which are very important in military training. Also a variable that could influence

representation of participants seeking psychological support in the military environment could be the hypothesis of the social desirability about the military personnels capacities to grapple on their own with any difficulty, so it would be interesting to clarify this aspect in the future. In addition, future studies could look at a) the way that military personnel's social identity influences the representation of in-group or out-group identity and b) the intention of seeking psychological support at different levels of military personnel.

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The Army Malaria Institute: Fifty Years of Esteemed “Vampire” Service

J. Pearn

Abstract

The Golden Jubilee (2016) of the Army Malaria Institute is a significant event in the history not only of the Australian Defence Force, but that of the Australian nation. The Institute's research – entomological, pharmacological, epidemiological and clinical – has been crucial in the maintenance of optimal healthcare for every operational and humanitarian deployment of Australian servicemen and women since the Second World War. The work of the Institute depends on the diagnosis of both clinical and experimental malaria by blood smear analysis. This basic procedure, ubiquitous to all clinical and preventive health endeavours, has meant that every patient with a fever and every malaria research volunteer are subject to serial blood-taking. The nickname, “Vampire”, was given by apprehensive soldiers to those medics, nurses, pathology technicians and AMI researchers, taking blood. In the Vietnam War, CALLSIGN VAMPIRE and the VAMPIRE PAD (helipad) assumed great significance as a place of rescue, resuscitation and optimal medical treatment. Since the Vietnam War, “Vampires” entered the lexicon of Australian soldiers' neologisms. Such is recalled as a living and enduring witness of 50 years of esteemed service – that every serviceman and woman might be protected from malaria, still in the twenty-first century a major killer of humankind.

Keywords: Australian Army Malaria Institute; malaria research; Vietnam War; history of malaria; vampires

Introduction

A Golden Jubilee is a special time. It is a time for looking back; but, in so doing, it is an occasion for using the tool of history to plan for the future. Very few military institutions have, integral to their remit, a mission of research and the creation of new knowledge. The Australian Army Malaria Institute is one such. Its 50 years of service has the proudest record of ensuring optimal healthcare of our deployed servicemen and women. Its skills and advocacy will be greatly needed in the unknown future.

Malaria is, of course, primarily an infection of the reticuloendothelial tissues of the liver and the spleen and of the circulating blood. Blood is the portal of malarial infection; and its parasitised red cells are the cause of its dramatic clinical symptoms; and is also the medium of its diagnosis. The constant mutation of the parasite, leading to drug resistance, necessitates constant research. For 50 years, human volunteers, Aotus monkeys, mice and birds have been bled for the research that keeps this focused field of preventive medicine “ahead of the game”. For more than 100 years, Australian troops, stricken with malaria, have been bled in order that an accurate diagnosis be achieved, and a cure guaranteed.¹

Medics and pathology technicians taking blood for such tests have always been the subject of a grudging reputation among soldiers – perhaps of being too enthusiastic in their blood-taking work! Certainly, since 25 May 1966, when Lieutenant Colonel Bill Rodgers established the 2 Australian Field Ambulance within the perimeter of the 1 Australian Logistic Support Group at Vung Tau in South Vietnam, army medics have so often been referred to as “vampires” – usually by an apprehensive and slightly reluctant patient, as their blood is being taken for diagnosis.

As blood-taking is basic and fundamental to the diagnosis, management and research in the context of malaria, this paper summarises some historical details of this universal procedure; and of the Australian military folklore which has surrounded it.

Blood-taking in Perspective

Bloodletting has been one of the most common medical practices over the 2500 years of the written history of medicine. Bloodletting was enthusiastically practised by Egyptians and Greeks, by ancient Jewish doctors and the earliest Islamic physicians. In western medicine, the practice of bloodletting arose from Galen's promotion of Hippocrates' (460-377



Figure 1: An informal, early “Vampire” sign outside 1 Australia Field Hospital, Vung Tau, South Vietnam. Photograph, May 1970.



Figure 2: A patient's eye view, on landing at the Vampire Pad, CALLSIGN VAMPIRE, at 1 Australian Field Hospital, Vung Tau, South Vietnam. Photograph, May 1970.

B.C.) teaching that disease was due to an imbalance of the four humours of the body – blood, black bile, yellow bile and phlegm. Blood was the source of heat; and as fevers implied too much heat, blood-letting was the logical treatment. Galen's teachings predominated for 1500 years. It was recorded that:

“A massive amount of blood was drawn from President George Washington for his throat infection, accelerating his death in 1799.”²

Bloodletting was still recommended for sunstroke by Sir William Osler in his 1901 (Fourth) Edition of *The Principles and Practice of Medicine*; and still in 1923 for severe congestive cardiac failure.³

Blood-taking for Malarial Diagnosis

Erythrocytes were first described by Antonj van Leeuwenhoek (1632-1723) of Delft in 1674. In 1879, Paul Ehrlich (1854-1915), initially described as “an indifferent student” but later (1908) Nobel Laureate in Medicine and Physiology, obtained his doctorate with a thesis entitled *Contributions to the Theory and Practice of Histological Staining*. He stained tissue and blood with aniline dyes, thus demonstrating intracellular structure.

In the following year, on 6 November 1880, the French army surgeon, Alphonse Laveran (1845-1922) was stationed in Constantine in Algeria. He did not know of Ehrlich's invention of bloodstaining from the previous year, but examined the blood of a soldier with clinical malaria. Laveran wrote that:

“...on the edges of a pigmented spherical body, filiform elements move with great vivacity, displacing the neighbouring red blood cells”.⁴

Laveran had seen the exflagellating motion of a male malarial gametocyte. He reported his findings on this “New Parasite Found in the Blood of Several Patients Suffering from Marsh Fever”.

In 1886, Camillo Golgi (1844-1926), he of the apparatus, showed that clinical malarial paroxysms of fever were coincident with the sporulation of the parasite. Later, in 1889, Golgi also demonstrated that the malarial parasite of “quartan fever” was different in microscopic form from that which caused tertian fever.⁵ In 1890, of crucial importance, Dimitri Romanovsky invented a special stain to demonstrate the malarial parasite in red blood cells. He heat-fixed thin blood films and used a combination of methylene blue and eosin to stain differentially the nucleus and cytoplasm of the parasite.⁶ It was this stain that Ronald Ross was to use, seven years later, in his definitive discovery of the transmission of malaria by mosquitoes.

On 20 August 1897, in Secunderabad, Ronald Ross demonstrated malarial parasites in the gastric lining cells of a virgin anopheline mosquito, fed four days previously on a human patient with clinical malaria.⁷ In the following year, 1898, Paul Ehrlich defined different types of leucocytes – eosinophils, basophils and lymphocytes – which immediately led to the concept of the differential leucocyte count. Since that time, every patient with a fever has had blood taken for initial diagnosis; and serially to monitor the successive treatment and subsequent convalescence.

Three of the pioneers who made possible the discipline of malariology today, were all awarded the Nobel Prize for Medicine or Physiology: Ronald Ross in 1902; Alphonse Laveran in 1907; and Paul Ehrlich in 1908.

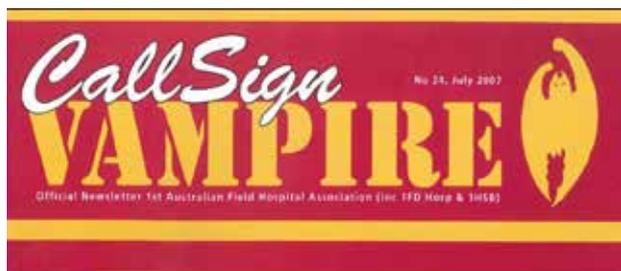


Figure 3: Caption of the official newsletter, "Call Sign VAMPIRE", the periodical of 1st Australian Field Hospital Association, from 2007.

Australian Military "Vampires"

The term "vampire" has become one of proud heritage, held by veterans who served initially in three Australian military medical units in the Vietnam War - 2 Field Ambulance, 8 Field Ambulance and the 1st Australian Field Hospital. 2 Field Ambulance was opened at Vung Tau in Phuoc Tuy Province in June 1966. From that date, until 1972, battlefield aeromedical evacuations ("DUSTOFFs") were conducted by UH-1 Iriquois helicopters of the US 57th Medical Detachment and by eight Iriquois helicopters of 9 Squadron of the Royal Australian Air Force. The callsign of the Australian receiving medical unit was CALLSIGN VAMPIRE.

Callsigns in the Vietnam War were designated by the US command, following recommendations from the Australian commanders. In June 1966, there was a Staff and Command direction that the callsigns of Phuoc Tuy Province be bird names. Callsigns ALBATROSS, HERON AND SEAGULL were already designated. Lieutenant Colonel Bill Rodgers consulted with the officers and sergeants of 2 Field Ambulance and the name "Vampire" for both the radio callsign and the helipad of the Field Ambulance was proposed. Later, as Major General Bill Rodgers, Bill told me that perhaps the Americans did not realise that the vampire was a flying mammal, not a bird; but all agreed that "it was close enough" for the required conformity.⁸ 8 Field Ambulance replaced 2 Field Ambulance in April 1967; in turn to be replaced by the 1 Australian Field Hospital on 1 April 1968.

A total of 1,918 Australian battle casualties and 10,000 non-battle sick and injured soldiers were evacuated to VAMPIRE PAD by "DUSTOFF" between 1966 and 1972. There were also landed, to repose in reverent dignity, the bodies of more than 500 Australian and New Zealand servicemen killed in action.



Figure 4: The Vietnam War Memorial, Anzac Avenue, Canberra. Etched on the side of this memorial are radio transcripts including "Vampire Pad", and "when we reached Vampire Pad we knew we had made it". Photograph, November 2011.

In 1997, RAAMC veterans of the Vietnam campaign formed the First Australian Field Hospital Association. It was decided to adopt the vampire symbol as the logo of the Association.⁹ Mrs Robyn Russell (formerly WRAAC Robyn Tolk), wife of WO₁ George Russell OAM, designed the logo – finally a simple black vampire silhouette with its "fist" raised triumphantly to simulate both the concept of "first" and the excellence of the work of the Military Hospital and its "vampires".¹⁰

Conclusion

Malaria has been a major determinant of the outcomes of military campaigns throughout history. In his major book, *An Unending War*, Dr Ian Howie-Willis has vividly portrayed the centrality of malaria control in the campaigns fought by all Australian servicemen.¹¹ In the twenty-first century, malaria continues to be a major threat to military operations.

Military strategists and medical planners recall the annual malarial rates of 2,900 casualties per 1,000 troops in the Buna, Gona and Milne Bay Campaigns of 1942.¹² Soldiers cannot shoot straight, let alone fight, with clinical malaria. After an attack, often a month's convalescence is required before full health is restored. Prophylaxis brings its own concerns, both clinical and psychological, as well as political, as witnessed by recent (2015-16) aggrieved soldiers who took mefloquine to preserve fighting strength.

The preservation of health of future servicemen and women can be ensured only by continual research across the coordinated domains of entomology, pharmacology, experimental pathology and clinical medicine. Such involves the sampling of blood; and a continuance of the proud traditions of both the "vampires" and the research volunteers who make such advances possible.

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Application of Clinical Governance in a Role 2E Hospital: The 2nd General Health Battalion Experience

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Abstract

Improvements in clinical governance in Australian Army health services in recent years have reflected and drawn upon developments in the civilian sector. This paper describes how 2 GHB adapted and incorporated key civilian health system measures to drive improvements in the quality and safety of clinical care. Health restructure initiatives included optimisation of corporate and clinical governance by introducing a Director of Clinical Services to assist the Commanding Officer, a similar structure for technical and command authority to that found in modern civilian hospitals. A Clinical Governance Framework was introduced to provide a platform for identifying and addressing areas for improvement, acknowledging that the delivery of health care endeavours to meet the expectations inherent in the Australian standards while taking place in a unique and often austere environment with no readily comparable Australian civilian benchmark. The framework included a dedicated process to evaluate and improve clinical services based on the National Standards promulgated by the Australian Commission for Safety and Quality in Health Care with a view to achieve external certification of a deployable R2E capability. Clinical governance measures were intensified in 2015 as part of preparations for the deployment of a R2E to Operation OKRA, Australia's support to Iraq in combating Da'esh. These measures included intensive, realistic clinical training and collective certification exercises (HOSPEX) evaluated by expert independent assessors. During Operation OKRA the Clinical Governance Framework was tailored to meet the challenges of health care in a specific operational setting.

All authors declare no conflict of interest.

Introduction

The delivery of health care in the deployed military environment has many challenges. These include the complex and labile requirements of the supported force, the austere, potentially hostile environment and the limited availability of health personnel, equipment and resupply that would be regarded as 'the norm' in civilian settings. In Australian health care, especially in the last decade, there have been emphatic changes in regulations, structures and processes to deliver health care of a standard that meets community expectations and which embraces safety and quality at its very core. These developments in 'clinical governance' have included improvements in the registration and credentialing of health practitioners, requirements for continuing professional development, and adoption of national standards to drive improvements in specific aspects of the quality and safety of health care¹.

Australia's military lead in the provision of deployable surgical capability (NATO Role 2E or R2E) is the 2nd General Health Battalion (2GHB). As a deployable hospital, 2GHB has unique challenges in maintaining the preparedness of its clinical workforce, equipment and procedures. It addresses these challenges through a number of measures including partnerships with civilian hospitals (for clinical experience and benchmarking of processes) and the involvement of Army Reserve health specialists in supporting alignment with civilian practice developments and standards.

In 2010 the CO of 2GHB recognised the important impact that a strong clinical governance framework could contribute to the delivery of safe, high quality health care, particularly within the limitations of the deployed environment. Since then 2GHB has drawn upon civilian experience in clinical governance to develop and implement a series of initiatives to

support and strengthen clinical governance in a deployed military setting. Key measures included:

- development of a CO Directive on Clinical Governance;
- introduction of a Clinical Governance Framework (CGF) supported by the creation of a Directorate of Clinical Services to provide leadership and oversight of the quality improvement processes;
- incorporation of the ten national ACQSHC standards mandated for civilian hospitals²; and
- adoption of the UK Hospital Exercise (HOSPEX) as a means of 'certifying' the ability of 2GHB to meet and provide a suitable standard of health care³.

The impact of these initiatives was validated when 2GHB was tasked in 2015 to support Operation OKRA, a deployment to the Middle East Area of Operations (MEAO). This paper describes the experiences of 2GHB in terms of the Army Combat Health Restructure, development of a CGF, force preparation and clinical governance on deployment in Iraq.



Image 1: 2 GHB deployed in the field in 2014

Army Combat Health Restructure

Prior to 2010, 2GHB had functioned under the sole direction of its CO. The CO had responsibility for all aspects of the unit's field hospital service delivery, including clinical output, administration, defence and survivability in the field. Civilian hospitals have addressed the problem of leadership overload by creating a management diarchy – a Chief Executive Officer focussing on general management, and a Chief Medical Officer for clinical matters. The Chief Medical Officer is responsible for all clinical matters including the technical supervision of healthcare staff.

In 2010 as part of the Army Combat Health Restructure, the decision was taken to mirror civilian practice by separating the command leadership and management function from that of clinical leadership. Accordingly, the position of Director of Clinical Services (DCS) was created at the Colonel level to attract and exert the appropriate level of clinical and military experience. As the most eligible candidates for the role were Reservists (specialist clinicians in civilian employment), it was decided to supplement this appointment with the Regular Army Senior Nursing Officer appointed as the Deputy Director Clinical Service (DDCS) at the Lieutenant Colonel level. The DDCS was given responsibility for workforce training, particularly focussed on unit nurses and medics, while the Senior Medical Officer (SMO) retained oversight of the development of the unit's Regular Army General Duties Medical Officers.

This arrangement had two distinct advantages in addition to separating the responsibility for general management from clinical service delivery. The partnership (combination) of medical and nursing leadership led to mutual understanding of patient needs across the continuum of patient care, vital to managing any hospital workforce. Secondly, with one incumbent a Reservist and the other a Regular officer, continuity of work output and coordination when the unit is not deployed was enhanced. In the field on exercise, the working relationship strengthened, and the capacity for continual technical supervision of healthcare safety and quality assured.

Access to health Reservists brought significant civilian expertise and corporate knowledge. This substantial "value-adding" created access to clinical and general management tools that 2GHB might otherwise have had to develop. Examples included a Clinical Risk Register already attuned to international standards (ISO 31000), and knowledge of casemix data for evidence-based training simulations.

Along with this key change in corporate and clinical governance management came the rationalisation of sub-units specialising in the clinical and clinical support functions necessary for an autonomous field hospital. A *departmental* focus and culture was achieved, with military groupings broadly replicating civilian hospitals. It is now common to hear unit members speak of being "OTs or Theatre Techs" (Operating Theatre Technicians) rather than Nurse Assistants posted to the Surgical Company.

The DCS/DDCS combination took responsibility for several support functions and processes to enhance patient care. These included clinical skills training for individuals and teams, monitoring

current and upstream medical developments, and the maintenance of credentialing for posted and contracted clinical staff. Across the unit, communication structures were improved to ensure the best possible consultation and co-operation occurred to supplement the corporate governance (or command) function inherent in all complex organisations. Corporate communications such as Standing Operating Procedures (SOP) were reviewed to ensure clinical needs were accommodated, with SOPs specific to the clinical function modernised and benchmarked with civilian practice.

Development of a Clinical Governance Framework and certification of a deployable R2E capability

The adoption of a formal framework for clinical governance has been essential to improving safety and quality in health care provision at 2GHB. A clinical governance committee chaired by the DCS and inclusive of the CO, heads of clinical Departments and professional leads (e.g. SMO, SNO, Training, Infection Control and Patient Safety Officer) met regularly to focus initially on improvements in clinical education and training, clinical audit, clinical effectiveness, transparent clinical practice review, risk management and research. This forum paralleled the unit's existing command conferences chaired by the CO, with significant dual membership enhancing cross-communication. Informing and collaborating with higher formation processes strengthened the CGF and formally incorporated Continuous Quality Improvement (CQI) processes, committing 2GHB to benchmark its standards and processes against Australian civilian healthcare

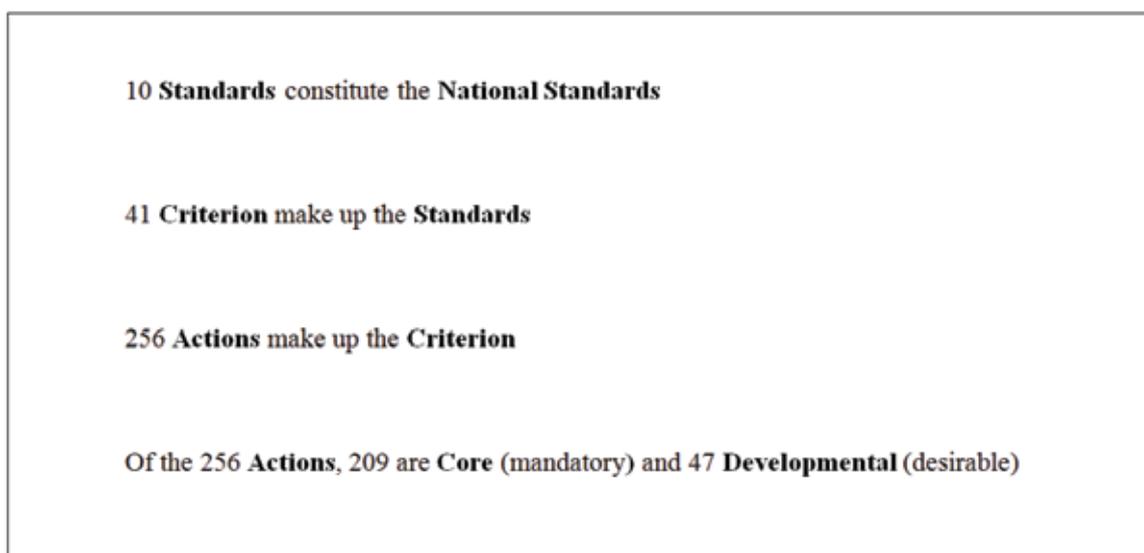
providers using the same CQI tools and measures.

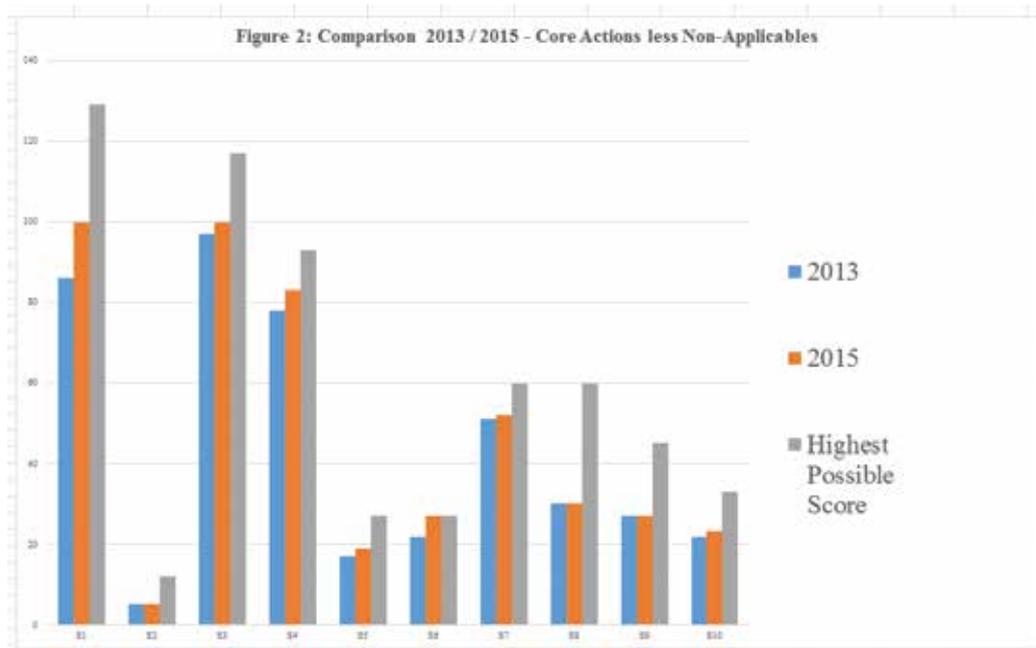
From 1 January 2013, all Australian civilian hospitals and clinical day care facilities were required to adopt new safety and quality standards. Developments over the preceding years led to the National Reform Agenda for the provision of healthcare in Australia. That Agenda includes the derivation of universal National Quality and Safety in Health Service (NQS) Standards. These Standards are determined by the Australian Commission for Quality and Safety in Healthcare (ACSQHC), represent agreed best practice and are now mandated under legislation for all healthcare providers operating under the jurisdiction of the states and territories.

The Standards comprise:

1. Governance for Safety and Quality in Health Service Organisations
2. Partnering with Consumers
3. Preventing and Controlling Healthcare Associated Infections
4. Medication Safety
5. Patient Identification and Procedure Matching
6. Clinical Handover
7. Blood and Blood Products
8. Preventing and Managing Pressure Injuries
9. Recognising and Responding to Clinical Deterioration in Acute Health Care

Figure 1: Components of the National Standards





10. Preventing Falls and Harm from Falls

Each of the Standards consists of several Criteria, and Actions to support each of the Criterion as shown in Figure 1. Standards are subject to revision, validation and update, the next iteration scheduled for 2017. The Standards will form the basis for service provision and comparative benchmarking for the foreseeable future.

Legislation does not mandate NQSHS standards compliance by Commonwealth (e.g. Defence) health providers. However, 2GHB chose to adopt the National Standards approach to support CQI within the Unit because it clearly aligned 2GHB to national (community) expectations for patient safety and quality and it formed a framework for any future accreditation/certification of health services (1).

In 2013, a dedicated CQI project commenced with the engagement of a specialist CQI coordinator to ensure high level input and project continuity. The project team was formed with the designation of a Standard Leader and a backup member for each of the ten National Standards to ‘insure’ against changes to personnel through posting or deployment. Training and briefings were conducted to incorporate the necessary process and content knowledge.

The project began with a self-assessment and gap analysis against all 209 Core Actions (as described in Figure 1). Some of the remaining 47 Developmental Actions were included. The self-assessment yielded a rich quantum of evidence about what was already in place, and what was not. The gap analysis

commenced in 2013, led by the Standard Leaders with the support of the project coordinator. Each Standard team came together periodically for peer review, analysis and collective consensus on the “organisational health” of 2 GHB. This step resulted in the identification of key areas including patient identification and documentation, infection control and clinical handover. This led to a formal Action Plan for implementing improvements (e.g. SOP). Some actions were readily amenable to improvement, others required significant investment. The outcome of the Action Plan and the measure of improvement in the self assessment between 2013 and 2015 is described for each Standard (S) in Figure 2. A score for each Core Action was assigned as *Significant work required: 1, Progress made: 2, Met :3*, with the highest possible score (HPS) being a 3 in every Core (mandatory) Action.

The final step in the CQI project plan is the accreditation process. While not yet mandated for the ADF, accreditation by independent authorities such as the Australian Council on Healthcare Standards provides external oversight and reassurance that 2GHB will meet the expectations of the community in the delivery of safe, high quality clinical care.

Force preparation

The preparation for deployment to support operations or exercises fully occupies 2GHB. If the unit is not deployed on exercise or operations, it is preparing to do so. Preparation and training occurs at an individual, team, sub-unit and unit level on a continuous cycle.

Credentialing of all health practitioners at 2GHB is the first step in ensuring a suitably trained health workforce. 2GHB introduced credentialing procedures consistent with civilian best practice and has contributed to further developments on this topic within the wider ADF. It also utilises the credentialing process to identify individual training requirements to ensure suitably trained and capable staff are supported in their role.

Within barracks individual clinical skills are maintained through a series of placements with civilian hospitals and ambulance services. These placements support the retention and development of skills through exposure to a wide range of clinical settings, working alongside and under the supervision of specialist clinicians (often Reservists). It also exposes clinicians to current practice, providing necessary continuing professional development. In return, many are able to impart their own clinical experience to the benefit of the civilian agency.

Substantial clinical preparation (of individuals and teams) adds to the requirement for generic military skills and fitness required of Army. High fidelity clinical training, with a policy of minimal notional, is central to this preparation, with cases drawn from trauma registry data of injury from recent and current operations. Training is conducted in the context of known and likely deployments and as realistically as possible.



Image 2: Medics in a simulated casualty handling scenario

The Army Training continuum provides for individual, team and sub-unit preparation that culminates in larger full scale exercises to bring together all the elements of the R2E to practice

against the full gamut of possible clinical scenarios. The Primary Survey Exercise series provides a two phase approach of consolidation of clinical training (Phase 1) and collective training for the entire R2E against scenarios which test the process from point of injury to definitive care (Phase 2). These exercises allow the complex interactions of the hospital and its sub-functions to be exercised altogether. It is through this collective exercising and testing that 2GHB identifies improvements and seeks its 2RE capability certification.

Certification exercises are the final step in ensuring that the deployed R2E is ready. Since 2013, 2GHB has expanded the previous hospital certification process to conform to the UK HOSPEX model (3). The strength of HOSPEX is in the use of independent current subject matter experts to formally assess the performance of the R2E against predetermined performance indicators strongly correlated to the mission requirements and in a range of testing clinical scenarios.



Image 3: Practising and assessing the continuum of care are vital to CGI, focusing on “no blame” and full disclosure

Clinical Governance during deployment on Operation OKRA

The conventional land force training component of Operation OKRA, the Australian Government's assistance to the Government of Iraq in combating Islamic State/Da'esh, commenced in May 2015. The main focus of the 400-strong Australian and New Zealand land force contribution was to provide training for Iraqi Army infantry brigades rotating through the Taji Military Complex. Coalition health assists in Iraq in 2015 were scarce, and weather (particularly dust) precluded aeromedical retrieval on many days. The combined ADF/NZDF Task Group consequently deployed with an 'ANZAC' Role

2E hospital, the only surgical capability within the Taji Military Complex.

Operational and governance procedures implemented at the ANZAC Role 2E hospital closely mirrored those developed by 2GHB. The OC (a health General Service Officer) and the DCS each possessed extensive and appropriate experience for their roles. The OC took responsibility for personnel leadership and management, liaison, infrastructure and resupply. The DCS was the technical representative of the Surgeon-General ADF in ensuring the optimal clinical functioning of the hospital within the capability provided by the OC. Based on the 2GHB CGF, a Clinical Governance Directive was tailored to a range of locally-relevant applications, including provision for reporting, audit and patient feedback, haemovigilance and infection control reporting. In virtually every area of hospital practice, by its own assessment and that of the Task Force senior health officer (J07), the ANZAC Role 2E hospital met or exceeded Australian civilian hospital standards.

Specific tasks undertaken in the establishment phase of the hospital were classified according to the 10 ACSQHC Standards:

- Standard 1: Establishing a committee structure that gave clinicians ownership of the CQI process, including weekly morbidity / mortality and equipment resupply conferences and monthly haemovigilance and infection control committee meetings. These subcommittees reported to the weekly clinical governance meeting, which reported to both the command and technical control chains to the Commander Joint Operations and SGADF.
- Standard 2: A Patient Safety Officer was appointed, and patient feedback process instituted.
- Standard 3: An outbreak of severe gastroenteritis provided the opportunity for a primary care-based epidemiological investigation and infection control audit, with several important infection control measures implemented that resulted in the prompt termination of the epidemic.
- Standard 4: A list of nurse / medic initiated medications was approved; a 20% random documentation audit was commenced, with results fed back through the CG committee to individual practitioners.
- Standard 5: A new SOP was written for 'patient admission' that included patient identification policy.
- Standard 6: Formal ward rounds commenced;

Identify, Situation, Background, Assessment and Recommendation (ISBAR) training provided and this process was enforced in morning / evening nursing reports.

- Standard 7: A massive transfusion protocol and emergency (without crossmatch) transfusion protocol was established. An audit of likely blood use and wastage rates was submitted to the US Armed Forces Blood Program, with one consequence being the establishment of an Emergency Donor Panel for the provision of whole blood.
- Standard 8: A pressure injury reduction strategy was incorporated into the new admission SOP.
- Standard 9: The deteriorating patient / code blue SOPs were revised to match local environment, personnel constraints, and the physical layout of the hospital. Ward charts were changed to a 'between the flags' format with a request made to modify the official ADF form.
- Standard 10: Modifications to certain parts of the hospital were made to reduce the falls risk. A falls assessment tool was introduced as part of the admission SOP.

The CG committee spent much of the first three months addressing issues with deployed equipment. The authority to accept clinical risk of certain levels was defined in the SGADF-approved CG Directive, with almost all able to be tolerated or mitigated by the DCS at the local level without the need to refer to remote governance authorities. Clear definition of the authority of the DCS to accept or not accept risk was invaluable in rapid generation of the R2E capability.

Two issues for improvement were almost immediately identified:

- Standard 1: The lack of utility of Army Health Instructions in the deployed Joint or International environment. This required development of local policies to support clinical practice in a workforce that included RAN, RAAF and Coalition practitioners.
- Standard 4: The use of 2GHB forms (e.g. vital signs charts) that were introduced as improvements to officially endorsed ADF forms was problematic in the Joint operational environment. Changes recommended in barracks must be promptly incorporated into ADF documents.

The "command philosophy" of the DCS was to treat identification of any deficiencies as opportunities

for improvement and as markers of success of the clinical governance system, thus consistent with a CQI approach. This may be at odds with the notion of an immediately deployable, universally competent and capable organisation. However, it highlights the critical importance of a technical as well as operational reporting chain and justifies the faith and the investment in clinical governance that commenced at 2GHB in 2010.

Conclusion

The success of the first operational deployment of an Australian R2E hospital in ten years was enhanced through the process of clinical governance that had been underway at 2GHB. In the last five years 2GHB has embraced clinical governance, implementing a framework of structural and procedural reform,

audit and review that allowed all members to be involved in decision making to support clinical safety and quality and which culminated in the R2E deployment to Operation OKRA. However, the 'continuous' nature of CQI means that further effort and improvements will always be required.

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A Commentary: Rethinking approaches to Resilience and Mental Health Training

M. Crane, D. Boga

Abstract

While exposure to demands are normally considered to drain resources and threaten wellbeing, some people experience growth and development from adversity that fosters adaptations in human functioning. Recent research has revealed a positive role for adversity in building the ability to adapt well to future adversity. However, how and why adversity functions to facilitate resilience in some people is an empirical question. We propose that systematic self-reflection is an important strategy for facilitating resilience as a consequence of stressor exposure. The systematic self-reflection model of resilience building, presented in this paper, is a new approach to military resilience training intended to complement existing training methods that focus on the enhancement of adaptive coping used in the Australian Defence Force.

Keywords: resilience training, coping, training transfer, self-reflection

Introduction

Despite the contribution that resilience training can make when implemented in the workplace¹, there are limitations with approaches often used in militaries across the world as well as in other organisations keen to promote resilience in their employees. Increasing one's coping repertoire, while also reducing problematic coping styles (e.g., avoidance and thought suppression) is often a core part of training^{2,3}. For example, the Directorate of Strategic and Operational Mental Health within the Commonwealth Department of Defence has capitalised on key insights from the transactional model of stress and coping⁴ and Cognitive-Behavioural Therapy to create the BattleSMART training package. In this way, the BattleSMART program is faithful to two robust and well researched approaches to mental health and adaptive coping. Yet, training regarding *when* to use particular coping strategies allowing for the selection of situation-appropriate coping is often neglected in approaches to resilience training. A good-fit between coping and the nature of the stressors is referred to as coping flexibility and is understood to be critical to handling a diversity of stressful encounters and to resilient functioning⁵. Moreover, for training recipients there are often significant barriers to the successful modification of maladaptive coping. It is often distressing, or at least uncomfortable, for an individual to change their use of avoidance coping to a more adaptive style of coping because stressors are

perceived to be threatening. This reluctance limits the transfer of training to actual stressor situations.

A new approach: Systematic self-reflection

The proposed approach addresses the above limitations and is intended to complement resilience training that emphasises the teaching of adaptive coping strategies. Encouraging specific systematic self-reflection practices, as part of resilience training, can enhance the individual's insight into their coping and its effectiveness in different contexts increasing the use of situation-appropriate coping. Moreover, systematic self-reflection practices encourage the training participant to view stressors as an opportunity for building resilience and personal growth.

Systematic self-reflection is a practice considered to be essential to developing behavioural practices and has been identified as an important training tool⁶. Loughran (1996)⁶ defined reflection as 'the deliberate and purposeful act of thinking, which centres on ways of responding to problem situations' (p. 14). Thus, reflection is a process of self-inquiry and enables an individual to make decisions about what are effective and desirable behaviours in a given demanding situation. Ellis, Carette, Anseel et al. (2014)⁷ have shown the important role of systematic self-reflection in helping people to learn from their successes and failures. Although exposure to demands are normally considered to drain resources

and threaten wellbeing, some people experience growth and development from stressful experiences that foster adaptations in human functioning⁸. Recent research has revealed a positive role for adversity in developing the ability to adapt well to future adversity⁸. We propose that systematic self-reflection on the application of coping is an important strategy for facilitating resilience as a consequence of stressor exposure. The systematic self-reflection model of resilience building (Figure 1) proposes that resilience can be developed as a consequence of stressor exposure because stressors provide a context that allows the application and refinement of coping strategies. Our model is complementary to, but unique from, approaches to resilience that emphasise the role of important social (e.g., social support) or psychological resources (e.g., optimism)⁹. Systematic self-reflection on coping is a process that is intended to complement the use of adaptive social and psychological resources by reinforcing their application and reducing the use of maladaptive strategies. Therefore, social and psychological resources are an important foundation to systematic self-reflection.

For systematic self-reflection to be useful in the context of developing resilience it needs to involve specific cognitive practices. Figure 1 illustrates five

reflective practices that are considered important for the development of resilience as a consequence of stressor exposure. First, *recollection of critical incidents* involves a brief description of the incident and behavioural, physical, cognitive and emotional response to events. This practice is intended to help the individual notice the presence of maladaptive coping, or the application of adaptive behaviours (e.g., support seeking) and thinking styles (e.g., optimism) defined by previous models of resilience⁹. Second, *coping values and goals* requires the individual to consider how they would ideally respond under pressure and what personal goals and values this represents. Third, *evaluation of effectiveness* is an examination of whether the initial coping strategies were useful in attaining the valued coping. Fourth, *analysis of why/why not effective* requires the individual to consider why his/her response was more or less effective in allowing the achievement of valued coping. Finally, *approach to future stressors* involves the development of a strategy for managing similar future stressors based on the assessment of past strategies. These five practices are intended to enhance: (1) coping flexibility, (2) situation-appropriate coping, and (3) perceptions of stressors as opportunities for resilience building. In turn, these practices will lead to the development of greater resilience.

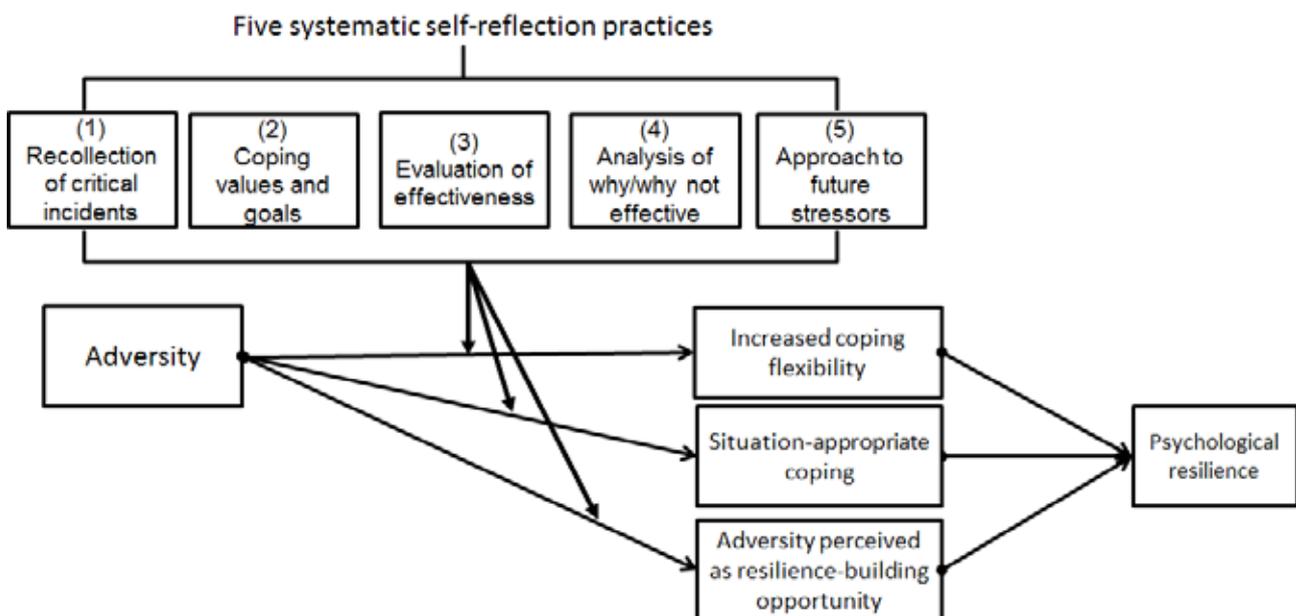


Figure 1

There is a necessity for reflection to be followed by further testing of coping styles in response to stressors and further adjustment where necessary. This feedback process is illustrated in Figure 2. According to Schön (1983)¹⁰ *reflection-in-action* acknowledges the importance that thinking is accompanied by doing, which allows application and then the modification of practices so that discovery and learning can occur. BattleSMART does go some way to addressing this by asking participants to *test* the appropriateness of coping strategies and *adjust* their strategies accordingly. This is referred to as *test and adjust* in the BattleSMART model². However, it is this critical piece that needs to be emphasised, elaborated, and practiced in situ.

The systematic self-reflection process may initially seem reminiscent of critical incident debriefing which has received mixed support¹¹. However, while debriefing usually occurs after exposure to potentially traumatic events, systematic self-reflection is encouraged after the onset of all stressors. In fact, less significant adversities are likely to be a good opportunity to begin refining one's approach to coping because the nature of the stressor is less aversive providing an opportunity to engage in elaborative self-reflection. Moreover, debriefing practices focus on the management of distress and preventing the later onset of mental illness¹¹. The focus of the systematic self-reflection is on the use of adversity as a growth opportunity and the formalised analysis of coping effectiveness.

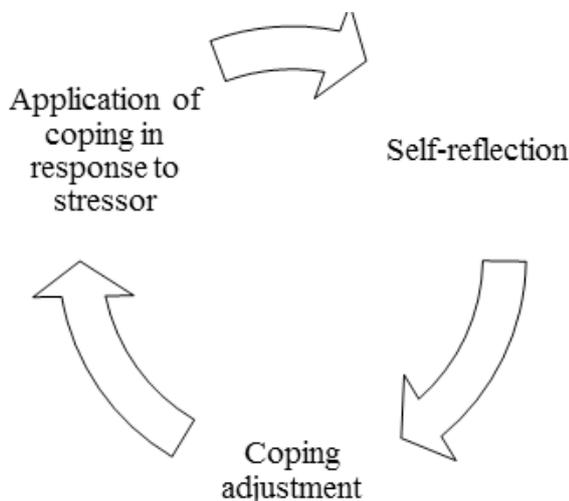


Figure 2

Systematic self-reflection and adversity as an opportunity for resilience-building

Engaging in self-reflection of this type is also proposed to influence the motivational system in a way that encourages stressor engagement. The term motivation is generally used to describe the forces that provide an incentive for people to initiate and persist at some form of behaviour leading to desired outcomes¹². It is often difficult to motivate people to engage with events, thoughts or emotions that are considered to be inherently stressful or distressing. Self-determination theory¹² describes different motivations for engaging in particular behaviours and delineates the existence of weaker from stronger psychological motivators. Weaker motivators are considered to be externally controlled and these reflect behaviours contingent on reward or punishment (external regulation) or those required to feel as sense of self-worth (introjected regulation). Stronger motivators are those that align the activity or desired behaviour with identified values, achievement or important goals, or because the activities are inherently enjoyable. Motivation derived from these aspects is referred to as *autonomous* motivation¹². The systematic self-reflection process is intended to increase one's autonomous motivation to engage with stressors by helping individuals to view stressors as an opportunity for resilience-building and personal growth in-line with personal values and goals. In the context of the military, this allows resilience training to be readily aligned with meeting one's desired performance goals, rather than the prevention of mental illness (which is perhaps not perceived as immediately important to personnel who are fit and well).

A strategy that can be implemented by leaders

The other critical aspect of systematic self-reflection is that it can be implemented by leaders, rather than exclusively by mental health practitioners. Leaders can be trained to facilitate systematic self-reflection after critical events and this is important for two reasons. First, the program will be more sustainable given that training administration is distributed across different personnel. Second, the development of resilience is integrated into daily work and training practices (e.g., post-activity reviews) facilitating training transfer and the integration of mental and physical aspects of performance.

Conclusion

The purpose of this commentary was to present a process for building resilience as a consequence of exposure to stressors that can complement existing resilience training, both in the military and other organisations. At present, the strategy is conceptual and the authors encourage a formalised evaluation prior to broader application. However, we believe that self-reflection has the potential to increase the efficacy of resilience training by giving the individual tools to self-assess and improve their own coping and view stressor events as an opportunity for growth.

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Risk of Suicide Among Veterans with Traumatic Brain Injury Experiencing Homelessness

B. Palladino, A. E. Montgomery, M. Sommers, J. D. Fargo

Introduction

Suicide is the tenth leading cause of death in the United States; during 2013 more than 41,000 individuals died as a result of self-inflicted injury, a rate of 13 suicide deaths per 100,000 individuals¹. The rate of suicide among the 22 million veterans in 2013 was almost three times the rate in the general population². Several investigations have demonstrated an association between suicide and traumatic brain injury (TBI)³. TBI—a type of acquired brain injury that occurs as a result of a blow, jolt, or bump to the head or a penetrating injury that disrupts brain function⁴—has been diagnosed among more than 333,000 service members since 2000⁵. Repeated traumatic brain injury (rTBI) can result in damage to the cerebral axons and lead to symptoms such as impaired judgment and impulse control, memory loss, confusion, aggression, and depression⁶.

A study assessing TBI among veterans engaged with homeless services programs provided by United States Department of Veterans Affairs (VA) found that 47% had a probable TBI which is almost 4 times the rate of TBI among the general population⁷. While research has addressed the relationship between TBI and suicide, as well as TBI and homelessness among veterans generally, no research has examined suicide risk in veterans with TBI who are also experiencing homelessness. Given the fact that veterans comprise 11% of the adult homeless population in the United States⁸, and have high rates of suicidal ideation and suicide attempts⁹, as well as TBI, this is not a trivial gap in current understanding. This study aimed to understand the associations between suicide risk and physical, psychological, social and military characteristics among veterans with TBI who are experiencing homelessness.

Materials & Methods

Sample

The study sample included 103 veterans who presented for homeless outreach services between December 2010 and September 2011 at either a VA medical center or a drop-in center for veterans experiencing homelessness and who screened positive for TBI on two instruments, described below. An additional 19 veterans were determined ineligible for the study because they did not screen positive for TBI on both instruments; 84.4% of all participants were retained in the sample.

Measures

Demographic information. Basic demographic information included race, education, marital status, military branch and rank, and experience of deployment and combat.

TBI-4 Questionnaire. This 4-question brief screen assessed history of TBI among veterans accessing VA homeless services. A positive response to any of the following items indicated TBI: (1) Have you ever been hospitalized or treated in an emergency room following a head or neck injury? (2) Have you ever been knocked out or unconscious following an accident or injury? (3) Have you ever injured your head or neck in a car accident or from some other moving vehicle accident? 4) Have you ever injured your head or neck in a fight or fall?

Ohio State University TBI Identification Method (OSU TBI-ID). The OSU TBI-ID is a structured interview designed to elicit self-report of a TBI occurring over a person's lifetime with a focus on (1) injuries caused by a blow to the head or high-velocity forces; (2) altered consciousness; (3) treatment received;

and (4) sequelae. Information is obtained on the number of injuries, severity of injuries, initial and persistent sequelae and age at time of injury. The present study assessed the following variables from this instrument: mean number of TBIs, veterans' TBI experience—whether the veteran experienced loss of consciousness (LOC), being dazed/confused without LOC and amnesia without LOC—and TBI-related symptoms such as headache, dizziness, ringing in ears, fatigue and sleep problems, blurred vision, temper and irritability, inability to manage stress, issues with memory and problem-solving and seizures. Scores from this instrument have a reliability between 0.84–0.93.

MINI International Neuropsychiatric Interview (MINI). The MINI is a psychiatric interview that assesses a number of psychiatric disorders including mania/hypomania, major depressive episode, panic disorder, agoraphobia, anxiety disorder, post-traumatic stress disorder (PTSD), alcohol/substance abuse and dependence and psychotic disorders. The MINI has a reliability of 0.76–0.93, a sensitivity between 0.46–0.94 and a specificity between 0.72–0.97, depending on the subscale.

The MINI also assesses suicide risk with a subset of 15 questions from which a total risk score can be computed: 1–8 indicates low risk, 9–16 moderate risk, and 17 or greater high risk. Suicide-related items include: feelings of hopelessness, thoughts of being better off dead, thoughts of hurting oneself, thoughts/plans about suicide or history of a suicide attempt. We dichotomised risk for suicide as no/low/moderate versus high risk. There were no substantial differences in demographic and mental health characteristics between those with no, low or moderate risk for suicide.

Procedure

To participate in the study, veterans had to be at least 18 years of age and seeking homeless services through the local VA medical center. A psychology technician employed by VA administered each of the measures described above; veterans who were not found to screen positive for TBI, on both the TBI-4 and the OSU TBI-ID, were excluded. This study was approved by the Institutional Review Boards of the

University of Pennsylvania and the Corporal Michael J. Crescenz VA Medical Center.

Data Analysis

To compare the associations between suicide risk and physical, psychological, social and military factors, we conducted a binary logistic regression analysis with suicide risk as the outcome and a set of 29 predictor variables. We retained, in the models, predictor variables for which $p < 0.20$ in univariable logistic regression models. Although age, marital status, race, LOC and total number of TBIs were not significant in the univariable models, they were retained as control variables due to their theoretical importance.

Results

Demographic characteristics are presented in Table 1. All participants were male, between 29 and 79 years old ($M = 53.73$, $SD = 7.07$) and approximately half had been married at some point in their lifetime (52.4%, $n = 55$). Most participants identified as non-white (82.5%, $n = 85$). Depression was reported in 17.5% ($n = 18$) of the sample, anxiety in 9.7% ($n = 10$), bipolar disorder in 2.9% ($n = 3$), psychotic disorder in 7.8% ($n = 8$), and PTSD in 21.4% ($n = 22$). Alcohol abuse was reported in 32.0% ($n = 33$) of the sample and substance abuse, other than alcohol, was reported in 50.5% ($n = 52$). Approximately one-third ($n = 39$) had been deployed at least once and 14.6% ($n = 15$) had combat experience. Approximately two-thirds (63.1%, $n = 65$) of the sample had 3 or more TBIs, with 82.5% ($n = 85$) reporting accompanying LOC. Veterans who reported high risk of suicide also reported significantly more frequently that they experienced the following TBI-related symptoms: blurred vision, seizures and difficulty with memory/problem-solving and managing stress.

Results of the multivariate model are presented in Table 2. Factors associated with high risk for suicide included being previously married ($OR = 8.87$, $p = 0.044$), PTSD ($OR = 8.33$, $p = 0.04$), difficulty with memory/problem-solving ($OR = 8.42$, $p = 0.047$) and seizures ($OR = 17.26$, $p = 0.03$).

Short Communication

Table 1. Characteristics of Study Sample

	No/Low/Moderate Risk (n = 92)		High Risk (n = 11)		Total (N = 103)	
	Mean	SD	Mean	SD	Mean	SD
Number of TBIs	3.1	1.6	3.4	1.5	3.2	1.6
Age*	54.3	6.8	48.9	8.0	53.7	7.1
	n	%	n	%	n	%
Race*						
White	16	17.4	2	18.2	18	17.5
Non-white	76	82.6	9	81.8	85	82.5
Educational Level						
No high school diploma	7	7.6	3	27.3	10	9.7
High school diploma/GED	46	50.0	3	27.3	49	47.6
Some college	24	26.1	2	18.2	26	25.2
Associates/Bachelor degree	15	16.3	3	27.3	18	17.5
Marital Status						
Never married	45	48.9	3	27.3	48	46.6
Ever married	47	51.1	8	72.7	55	53.4
Branch of Military*						
Army	53	57.6	6	54.5	59	57.3
Non-Army	39	42.4	5	45.5	44	42.7
Rank						
E1–E2	26	28.3	2	18.2	28	27.2
E3–E4	50	54.3	8	72.7	58	56.3
E5–E6	16	17.4	1	9.1	17	16.5
Combat Experience	13	14.1	2	18.2	15	14.6
Deployment	35	38.0	4	36.4	39	37.9
TBI Experience						
Loss of consciousness (LOC)	76	82.6	9	81.8	85	82.5
Dazed/confused without LOC	67	72.8	8	72.7	75	72.8
Amnesia without LOC	26	28.3	4	36.4	30	29.1
TBI-Related Symptoms						
Headache	69	75.0	8	72.7	77	74.8
Dizziness	56	60.9	9	81.8	65	63.1
Ringing in ears	39	42.4	8	72.7	47	45.6
Fatigue/sleep problems	40	43.5	8	72.7	48	46.6
Blurred vision*	42	45.7	9	81.8	51	49.5
Temper/irritability	29	31.5	5	45.5	34	33.0
Managing stress*	25	27.2	7	63.6	32	31.1
Memory/problem-solving*	34	37.0	9	81.8	43	41.7
Seizures*	4	4.3	4	36.4	8	7.8
Mental/Behavioral Health Conditions						
Major Depressive Disorder	15	15.3	3	27.3	18	17.5
Psychotic Disorder	6	6.5	2	18.2	8	7.8
Anxiety Disorder	8	8.7	2	18.2	10	9.7
Bipolar I or II	3	3.3	0	0.0	3	2.9
PTSD*	15	16.3	7	63.6	22	21.4
Alcohol Abuse/Dependence	29	31.5	4	36.4	33	32.0
Substance Abuse/Dependence	44	47.8	8	72.7	52	50.5

Notes. * $p < 0.05$

Table 2. Physical, Psychological, Social, and Military Factors Predicting Suicide Risk Among Veterans with TBI Experiencing Homelessness

	OR	95% Confidence Intervals
Intercept	5.28	
Age	0.89	0.76–1.04
Loss of consciousness	0.14	0.01–2.07
Total number of TBIs	1.02	0.52–2.01
Previously married*	8.87	1.06–73.85
Race	0.51	0.03–8.65
PTSD*	8.02	1.10–58.53
Memory/problem-solving*	8.42	1.02–69.28
Seizures*	17.26	1.30–228.81

Notes. * $p < 0.05$. OR = odds ratio

Discussion

The present study is the first to assess the relationship between factors related to suicide risk among a sample of veterans experiencing both homelessness and TBI. The findings presented are particularly important given the high rates of TBI, suicide and homelessness among the veteran population. This study indicated that, although veterans reporting low-to-moderate risk of suicide are demographically similar to those experiencing high risk—and have suffered approximately the same number of TBIs—their reporting of post-TBI symptoms are significantly different. Veterans expressing high risk of suicide more frequently experienced blurred vision, difficulty managing stress, struggles with memory and problem-solving and seizures following a TBI; the presence of these symptoms may be an indication of a more severe TBI or rTBI which has been associated with increased risk of suicide. In addition, these veterans also more frequently reported symptoms consistent with PTSD which overlap to a large degree with symptoms of TBI.

This study found that veterans with PTSD had 8 times the odds of being at high risk for suicide, compared with those who did not have PTSD. Several other studies have identified a similar relationship between PTSD and suicide among veterans. Veterans experiencing homelessness who have PTSD may be at greater risk for suicide than non-homeless veterans for a number of reasons: they may have limited access to appropriate mental health resources given a lack of sustainable income or health insurance;

they are faced daily with stressful situations that can trigger or exacerbate PTSD symptoms, such as lack of food and shelter or unsafe conditions; or they may be struggling with alcohol and substance abuse which may worsen PTSD symptoms¹⁰.

The interpretation of study findings must be tempered by a number of study limitations. First, the sample was quite small, fairly homogeneous, and likely represented the setting from which it was drawn, limiting the ability to generalise to the larger population of veterans experiencing homelessness. Second, due to limitations of data collection instruments used for this study, the present analyses could not control for a number of variables including severity of the TBI and PTSD, whether these were the result of injuries incurred during combat and if symptoms reported by veterans were due to TBI, PTSD or some other condition. Third, the identification of marriage status as a predictor of suicide risk should be tempered by the fact that approximately half the sample was married, potentially biasing the results. Future studies should consider using administrative data, at the population level, supplemented with additional primary data related to the circumstances surrounding veterans' TBIs and experience of combat.

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High G Flight: Physiological Effects and Countermeasures

P. Leggat

High G flight is a significant challenge facing crew in high performance military aircraft, spacecraft, and in some other settings, such as acrobatic and tourism-based fighter jet aircraft in the civilian sector. It may also be experienced in high G simulators and commercial fighter jet tourist experiences. G is defined as “a dimensionless ratio which expresses the applied acceleration that an object undergoes as a multiple of the normal acceleration due to Earth’s gravity” (p19).¹ This first edition of *High G Flight: Physiological Effects and Countermeasures* is a textbook encapsulating a definitive review of aerospace medical research in the high G environment, which is supported by an impressive 60 pages of references.

The 1st edition of *High G Flight: Physiological Effects and Countermeasures* is presented as a 16 x 24 x 2 cm hardcover textbook, which is widely available online for purchase. The book contains a table of Contents, List of Figures, a Foreword by Lieutenant General (Dr) Thomas W Travis, a Preface, Acknowledgements, a List of Abbreviations, four main parts, 12 Chapters, References and a comprehensive Index. There is no glossary, which would be useful for non-medical readers, nor a list of equations, of which there are many in this textbook.

The primary target audience of *High G Flight: Physiological Effects and Countermeasures* is not clearly defined in the textbook, but it could be targeted at the author’s colleagues working in aerospace medicine, aerospace physiologists, and researchers in this field. It would also be a useful reference for those undertaking postgraduate studies in high G flight or undertaking advanced studies in aerospace medicine. As it may be of interest to a wider group, such as flight crew, these readers without broader aerospace medical training may be challenged by some of the medical terminology, such that a glossary may be useful to consider in future editions, as previously mentioned. The textbook will also be of passing interest to the growing band of travel medicine practitioners and aerospace physicians, who are providing advice to tourists exposed to high G flight, including various jet fighter experience programs, such as “edge of space” adventures², and

simulator training and sub-orbital flights into space planned by a number of commercial operators.

High G Flight: Physiological Effects and Countermeasures is divided up into four (4) parts, which provide a logical flow of discussion. Commencing with the origin and causes of G-related flight conditions in part “1. Mechanisms of G”, the textbook then covers physiological effects of those conditions and tolerance and adaptation mechanisms in pilots in part “2. Physiology of G” and part “3. Tolerance and Adaption” and concludes with a discussion of existing countermeasures against G effects in part “4. Countermeasures”. Chapters include “1. The Physics of Gravity”; “2. High G Flight”; “3. The Cardiovascular System at +1 Gz”; “4. The Cardiovascular System at High Gz”; “5. Respiratory Effects of G”; “6. Musculoskeletal Effects of G”; “7. Miscellaneous Clinical Effects of G”; “8. Tolerance to High G”; “9. Cardiovascular Adaption to Acceleration”; “10. The Anti-G Straining Manoeuvre”; “11. The G Suit”; and “12. Positive Pressure Breathing for G Protection”. The textbook is well supported with 32 figures, which effectively help to convey complex concepts. There are also numerous equations, which some may find challenging. There have been other book reviews, which have also been complimentary about the present work.^{3,4} One of these reviews mentions a number of instances of misprints and missing information,⁴ some of which were seen, but are difficult to confirm and do not disrupt the flow. These errors will need to be rectified in future editions.

Single author textbooks are becoming more uncommon, but they have the advantage of being highly consistent in style. The author, David G. Newman, MB, MB Monash, DipAvMed RCP(UK), MBA Deakin, PhD Newcastle, FRAeS, FAsMA, FACAsM, FAICD, FAIM, has impeccable credentials in both aerospace medicine and high G flight experience. As well as being a consultant in aviation medicine, David Newman is currently Associate Professor and Head of the Aviation Medicine Unit in the School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia. He has also served with the Royal Australian Airforce (RAAF) for 13

years, including two years as Chief Instructor at the RAAF Institute of Aviation Medicine, and is also trained as a pilot with flying experience in a number of military jet aircraft. Professor Newman has also been recognised with a number of highly respected international awards, most recently the John Paul Stapp Award from the Aerospace Medical Association (USA) in 2014.

High G Flight: Physiological Effects and Countermeasures is a compact, succinct and easy to read publication, despite the physics and physiological concepts that need to be digested. It appears to be one of the first textbooks of its type published by an aerospace physician. It is an essential resource for those working in aerospace medicine with crew experiencing high G forces and complements standard textbooks of aerospace medicine. It provides access to information, which

has traditionally been the domain of military aviation medicine courses. This 1st edition of *High G Flight: Physiological Effects and Countermeasures* will be a much sought after textbook for both professional and academic libraries supporting the civilian and military components of aerospace medicine.

Declaration of Interests

The reviewer won this present work as a book prize at the Australasian Society of Aerospace Medicine Conference held in Adelaide, Australia, 2015.

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Logistics in The Falklands War

Captain Arthur M. Smith

The recent Australian *Defence White Paper 2016* defined the unique security challenges facing the nation. Strategic planning within the document includes recognition of the regional and global nature of the nation's security interests, and the very different sets of challenges that are created for the defence force by state, and also non-state actors such as terrorists. The White Paper suggests that the defence budget should grow to 2 percent of gross national product, a significant part of which would be applied to the development of maritime capability.

Emblematic of this commitment is the recent commissioning of the two 27,800 ton amphibious assault ships (LHDs) of the Canberra class – *Canberra* and *Adelaide* – now progressing toward initial operating capability. At full operational capability, the ships will enable the embarkation of a full Amphibious Ready Group based upon the Second Battalion of the Australian Army and their supporting arms, reflecting a transition for the unit from a strictly ground force to an amphibious force. The two LHDs will join the existing capabilities borne by the 16,000 ton dock landing ship *Choules*, which will soon be upgraded from a command-and-control, as well as a weapons, perspective. The three ships together will hopefully constitute a flexible and deployable amphibious force.

Amphibious forces in the future, however, face the possibility of arriving in a future combat theatre and finding themselves facing an arsenal of advanced, disruptive technologies that could turn previously perceived technological advances and plans for force generation “on their heads”, where Australian armed forces no longer have uncontested theatre access or unfettered operational freedom to manoeuvre. The next century will see foes striving to target concentrations of troops and material ashore, while concurrently attacking forces at sea and in the air. The lessons learned from previous conflicts have never been more important; with increasing numbers of out-of- area operations required in remote trouble spots, and at short notice. Given this reality, the adaptive logistical requirements necessary for sustaining any expeditionary interventions require sober assessment and pragmatic planning.

Where are the precedents to help find such guidance? There have been no amphibious assaults to speak of since Inchon in the Korean War, and Suez in 1956. The British expeditionary assault upon the

Falklands in 1982, however, provided many lessons, given the inadequate training, little intelligence, no contingency plans, a politically driven rush, and an 8000 mile logistical tether from the homeland. It is not surprising, then, that logistics during the UK “Operation Corporate” were confusing and challenging. It is one of the best examples of “lessons learned” for addressing both anti-access and area denial in a modern conventional conflict.

There is a saying attributed to various past military commanders of the mid-20th century, that “amateurs or juniors discuss tactics, while their seniors and other professionals discuss logistics”. There is also a, perhaps apocryphal quote attributed to the former Chancellor of Germany, Otto von Bismarck, stating, “Fools state that they learn by experience. The wise man learns from the mistakes of others”. As such, the story of the British assault upon the Falklands, as recorded in the book, “Logistics in the Falklands War”¹ - by Major General Kenneth Privratsky, US Army (Retired) should be mandatory reading for all those who will partake in instituting preparations, as well as implementation, of future ADF amphibious operations. Surprisingly, in this tome written by an American General Officer/ professional logistician, with credible guidance from, among others, Major General Julian Thompson, the Commander of the 3 Commando Brigade at the Falklands War, the book details the saga of British efforts to supply the modern logistical equivalents of “Beans, Bullets, Black Oil and Bandages” to the invasion force.

The British ultimately won the war, chiefly because of their ability, in an improvised military campaign (for which they had no prior planning), to project and sustain a Task Force consisting of a Carrier Task Group and an Amphibious Task Group, across a distance of 8,000 miles. A vital role was played by the small British territory of Ascension Island in the South Atlantic, just over half way distance (3800 miles) to the Falklands. The 26 ships (later rising to 44) of the Royal Navy that took an active part in the campaign were supported by 22 ships of the Royal Fleet Auxiliary, including 6 specialist Landing Ships (Logistic), by two ships of the Royal Maritime Auxiliary Service, and by 54 requisitioned civilian “ships taken up from trade”, known as STUFT vessels, from 33 different civilian companies. Many of the civilian STUFT ships used had to be fitted with extra equipment, including helicopter landing decks,

specialist communications apparatus, and water treatment plants for the long voyage. In addition, the cruise liner *SS Uganda* was requisitioned and converted to serve as a hospital ship.

In the rush to sail, many of the ships of the Task Force were not “tactically loaded” or “combat loaded”. Most ships of the Task Force used a short halt at Ascension Island to redistribute personnel, stores and equipment before continuing to the Falklands. But, there were many reported cases of staff or equipment being assigned to more than one ship either at the start of the voyage, or at Ascension, and then losing contact with their parent unit or being unable to secure other transport.

The circumstances of the amphibious assault at San Carlos on the western side of the Falklands forced the British Navy and land forces to remain relatively fixed in place during the amphibious assault and beachhead buildup. This is when the Argentine air force unleashed its attack on British naval forces supporting the landing force. Within an hour of the first waves of Argentine aircraft attacking, it became evident that it was the ships, and not the men ashore, that were the targets. Because of the aggressive air attacks, the waters around the landing area and beachhead were referred to as “Bomb Alley”. Flying just above the wave tops, the Argentine based attack aircraft made repeated attacks on the British Task Force with bombs and Exocet anti-ship missiles. The Argentine air attacks initially sank one British destroyer, 2 frigates, and caused the sinking of one critically and logistically important container ship, Cunard’s *Atlantic Conveyor*. The attack upon *Conveyor* ultimately had a vastly negative effect upon British strategic mobility, by eliminating the main source of heavy lift helicopters which it was transporting for the landing force, all of which were lost at sea. Additionally, two more Destroyers, three frigates and three logistic landing ships were damaged.

Enemy action had an effect on the buildup in a way that simply was not anticipated. The entire brigade’s operations had been planned on the assumption of keeping its logistics afloat. Nevertheless, the air assault forced the UK to create huge dumps on land at Ajax Bay. The Argentine Air Force also attacked the beach head and dropped 12 bombs on the brigade maintenance area, killing 6 men and wounding 27, as well as starting a major fire in 45 Commando’s heavy weapons ammunition dump. The various stores ships were withdrawn, with only those unloading allowed in the area. The air attacks reduced the rate of off-loading supplies at San Carlos, which in turn slowed the start of the land campaign, thereby delaying logistics, resulting in the loss of manoeuvre

opportunity in terms of time and speed. Political as well as military considerations also limited the use of two large ocean liners which had been used as troop transporters, *SS Canberra* and *RMS Queen Elizabeth 2*, neither of which could be risked as a target for any length of time. Likewise, they were designed for pier-side loading and discharge, and would prove slower to unload in the South Atlantic than the Royal Fleet Auxiliary Logistic Landing Ships.

The original logistics plan called for a small base to be established ashore but for most brigade supplies to be kept afloat off the beachhead, including two LSLs carrying resupply, and the cruise ship/ troop transport *SS Canberra* for immediate although not Geneva Convention protected medical support. Sea transport along the coast was further limited, however, by the limited numbers of landing craft, together with powered rafts known as Mexeflotes, and other smaller craft, as well as by British reluctance to risk larger vessels close inshore.

Following the first landings at San Carlos, it became obvious that the plan to hold most supplies offshore and afloat was impractical in the face of Argentine air attacks. Ajax Bay was chosen for the logistics base ashore, as it was the largest of the very limited beach landing areas, and with the only buildings, foremost being a disused mutton refrigeration plant. The fleet auxiliary and STUFT ships had to be brought in under cover of darkness to unload, mostly sailing away before each morning’s air attacks. Most of the STUFT ships did not have the capability to unload by helicopter at night, despite the fact that unloading using landing craft and Mexeflote rafts was a long and difficult process.

The only suitable location for a field dressing station was at Ajax Bay, known as the “Red and Green Life Machine”, housed within the disused refrigeration plant next to a large ammunition dump. In consequence, the British decided not to mark the dressing station with a Red Cross for protection under the Geneva Convention since it was so close to the ammunition dump, and at one point it functioned with two unexploded bombs lodged in its roof. In four weeks, 725 patients were treated, including among them 40% Argentine casualties. By the time that the Argentines had surrendered, the “Red and Green Life Machine”, while under the supervision of then Surgeon Commander Rick Jolly, performed over 300 major surgical procedures upon both British and Argentine casualties, even though some arrived in such bad condition that they required as much as 5 units of blood to stabilise them prior to surgery. Within the facility, two British army and two Navy surgical teams worked side by side. The lighting was deemed inadequate, and there was no sterile water,

no autoclave, no diathermy machine, and a limited supply of linen. Gloves were worn but not often changed from one operation to the next.

In preparation for the Falklands assault, the British lacked a capable hospital ship. The only vessel in the Royal Navy earmarked as a potential hospital ship was the Queen's Royal Yacht *Britannia*, but, because she required special furnace oil upon which to operate, and only had a 200 bed capacity, planners deemed her unsuitable to support the task force. There were no friendly places to provide medical support in the vicinity of the Falklands closer than Montevideo Uruguay, (four and a half sailing days or 1000 miles) to the north-west. The projected inability to care for potential casualties therefore led to the requisitioning of the cruise ship *Uganda*. At the time, *Uganda* was in the Mediterranean at Alexandria, on an educational cruise carrying a thousand school children. After her owners received requisition instructions, *Uganda* proceeded to Gibraltar for modifications to accommodate a major surgical facility, an intensive care unit, a specialised burn ward (14% of all injuries incurred were burns), x-ray facility, as well as clinics and laboratories to treat patients, in addition to the installation of a helicopter deck to receive casualties. *Uganda* also lacked the capacity to produce fresh water for drinking or washing. Reverse osmosis fresh water generators were installed. Completion of *Uganda* at Gibraltar, complete with Red Cross markings to adhere to the Geneva Convention, occurred at a pace comparable to *Canberra* - in a mere 65 hours! While modifications were nearing completion, a 135 person medical team boarded *Uganda* to help store 90 tons of medical supplies for the new 500 bed floating hospital.

Uganda would provide the highest level of care in theatre. Following agreement among the warring parties, and with assistance of the International Committee of the Red Cross, she would be located in a restricted neutral navigational area designated a "Red Cross Box" at sea about twenty miles north of Pebble Island, along with two of Argentina's hospital ships, *Bahia Paraiso* and *Almirante Irizar*. Both countries had agreed that any casualties evacuated there should not participate further in the war.

The only communications available aboard *Uganda* was via maritime satellite. Three British fast dispatch vessels, former ocean survey ships *Hydra*, *Hecla* and *Hecate*, would transport 60- 100 British and Argentine casualties each, those patients requiring additional

or long term care, from *Uganda* to Montevideo, Uruguay. From there, the British casualties were transported by VC-10 medical evacuation planes, which would airlift the British casualties to the United Kingdom via Ascension Island.

Exposure to the cold weather was a problem for all troops in the Falklands and the boggy and rugged terrain also caused multiple cases of Trench foot and endemic mild diarrhoea from drinking the water. Battle casualty treatment and resuscitation at the unit level and evacuation functioned well, resulting in a very high survival rate for casualties treated. Of over 1,000 casualties evacuated back to the designated hospital ship *SS Uganda*, including over 300 Argentineans, all but three men survived. Worthy of note, however, was that the vast majority of British casualties occurred not on land, but at sea due to exploding fuel and the difficulty of reaching injured sailors in burning passageways and compartments. Ultimately, the war cost 255 British servicemen killed, 777 wounded with 10 percent of those permanently disabled, 6 ships lost, many other ships damaged, and 20 aircraft destroyed. For Argentina, it suffered an estimated 750 killed, 1100 wounded, and vast amounts of equipment lost.

As noted by British General Julian Thompson, on the scene in the Falklands, "Surely one of the strangest things in military history is the almost complete silence upon the problems of supply". Forces in the future, however, will again be expected to deploy quickly and operate over great distances in austere areas. When that happens, logisticians will need to provide support without reliance on fixed infrastructure, deep draft ports or airfields. The British experience at the Falklands highlights the difficulty of providing logistics over long distances into austere environments, particularly in situations of significant threat and especially for amphibious operations.

British Field Marshal Archibald Wavell stated, in 1944: "It takes little skill or imagination to see *where* you would like your army to be, and *when*; it takes much knowledge and hard work to know where you can place your forces and whether you can maintain them there. A real knowledge of supply and movement factors must be the basis of every leader's plan; only then can he know how and when to take risks with those factors; and battles and wars are won only by taking risks."

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Occupational and environmental health in the ADF

Commander Neil Westphalen

Introduction

ADF personnel are arguably exposed to the most diverse range of occupational and environmental hazards of any Australian workforce. Controlling these hazards is complicated not only by the number, size and complexity of ADF workplaces but also by its workforce demographics.

ADF workplace hazards significantly impact the physical and mental health of current and ex-serving personnel. High rates of preventable workplace illness and injury (in particular musculoskeletal injuries and mental health issues) indicate the need to improve the management of the occupational and environmental health hazards associated with all deployed and non-deployed ADF workplaces, with better emphasis on prevention rather than treatment.

It therefore seems reasonable that the ADF's health services should be premised on an occupational and environmental health paradigm. While the details of such a paradigm are beyond the scope of this article, it seems evident that, among other attributes, the resultant health care delivery model would include military and civilian occupational and

environmental physicians. These would not only perform occupational and environmental health policy and related roles but also provide workforce rehabilitation and other clinical primary health care services, alongside general practitioners in both garrison and operational settings.

However, the current health capability gaps between the current ADF health service delivery model, and one reflecting an occupational and environmental health paradigm suggest the need to reassess the fundamental inputs to capability for Joint Health Command and the Defence Work Health and Safety Branch. The reassessment should facilitate inputs to capability that reflect an occupational and environmental health paradigm, leading to a genuinely holistic and sustainable workforce-based ADF health service delivery model.

ADF workplaces

The ADF arguably has the most diverse range of workplaces in Australia. The allocation of its permanent and reserve personnel to the Services is shown at Table 1. When not deployed, they work in over 60 major bases and other facilities throughout Australia.

Table 1: ADF personnel allocation, 2014-151

Service	Permanent	Active Reserve	Allocation to (or otherwise providing direct or indirect support)
Navy	13,921	4750	47 commissioned and three non-commissioned ships
Army	29,010	14,166	wide range of combat and other deployable land units
Air Force	13,991	4316	259 aircraft
Totals	56,992	23,232	80,224

While many occupational and environmental health hazards are not unique to the ADF, compared to other Australian workforces its personnel are arguably exposed to the most diverse range. Examples include:

- Biological hazards, such as vector-, food- and water-borne infectious diseases;
- Physical hazards, such as climate extremes (both heat and cold), noise and vibration, and ionising and non-ionising radiation;
- Chemical hazards, such as heavy metals, asbestos, fuel and diesel exhaust, in the form of dusts, mists, fumes and/or vapours;
- Psychosocial hazards, such as shiftwork, fatigue, social/family isolation, and (regrettably) various forms of unacceptable behaviour such as bullying/harassment; and
- Ergonomic hazards, such as manual handling.

A unique characteristic of the ADF workforce pertains to its potential exposure to hazards that are deliberately intended to cause harm. These include physical hazards from weapons such as small arms, grenades, mortar and artillery rounds, sea-, land- and air-launched missiles, sea and land mines, and torpedoes, all of which can cause death or injury secondary to penetrating wounds, blunt trauma, blast injuries and/or burns. Nuclear and other radiological weapons pose additional physical hazards, as do biological hazards from weaponised bacterial viruses and toxins, and chemical hazards from weaponised blistering, choking and nerve agents.²

All these ADF workplace hazards require or are amenable to being managed using an occupational and environmental health paradigm.³

The ADF workforce

The ADF has one of the largest workforces in Australia. In 2014-15, it had 56,922 permanent and 23,232 active reserve personnel (totalling 80,154), of whom 2241 were deployed.⁴ These numbers do not include more than 20,000 inactive reserve personnel.⁵ By comparison, the Australian Public Service in June 2013 comprised 152,230 permanent and 15,027 non-ongoing (contract) employees.⁶ The three largest private employers in Australia in

2015 were Wesfarmers (205,000), Woolworths (202,000) and Rio Tinto (55,000).⁷

With 214 entry-level jobs alone across all three Services, the ADF also probably has one of the most complex workforces in Australia.⁸ ADF entrants are also required to meet demanding entry medical standards, while career ADF members have to maintain rigorous retention medical standards.

The ADF workforce also has a number of demographic characteristics specific to its occupational and environmental health requirements. For example, all serving ADF members are over 17 years of age and virtually all are under 65, whereas only 53 per cent of Australia's civilian population falls within these age parameters.⁹ Furthermore, unlike a number of other national military forces, the ADF's health services do not provide care for family members or veterans. The ADF population requiring health services is therefore exclusively a working-age population.

Along similar lines, around 30 per cent of permanent ADF members are under 25, which is more than double the percentage of the Australian population aged 15-25.¹⁰ The relative youth of the ADF workforce has implications regarding their medical presentations, in particular those related to risk-taking behaviours (including alcohol and other drug use), workplace- and sports-related musculoskeletal injuries, and mental health issues.

Also, around 85 per cent of both permanent and reserve ADF members are male, compared to about 55 per cent of the Australian civilian workforce.¹¹ This also has implications regarding illnesses and injuries secondary to various risk-taking behaviours among male and female ADF personnel, as well as the requirement to provide workplace and other health care services for a small but very important proportion of pregnant women.

ADF personnel also have relatively short periods of service (36 per cent of permanent ADF members had served less than five years in 2011),¹² implying high personnel turnover rates. Studies have confirmed that higher numbers of less-experienced employees tend to increase workplace illness and injury rates.¹³

ADF personnel also typically have high geographic mobility. Using Navy as an example,

two-thirds of its 14,000 or so permanent personnel are posted to shore establishments and other ADF organisations; the remaining one-third are posted to ships, one-third of which are at sea at any one time.¹⁴ All its permanent personnel participate in a three-year posting cycle, which equates to some 4700 planned personnel movements alone every year. Besides creating a challenging continuity of health care setting, such mobility has important workplace health implications, particularly regarding the nature and extent of mental health issues among Navy personnel, and by extension the other Services.

The ADF population is therefore medically selected, of young working age, geographically mobile, has high turnover rates, and is (still) predominantly male. Rather than reflecting a typical civilian general practitioner dependency per the broader Australian community, the ADF is first and foremost a workforce population.

ADF veterans

In 2015, Australia had about 339,000 veterans, including 150,200 with peacetime-only service.¹⁵ Of the total, 61.4 per cent were receiving health care services from the Department of Veterans' Affairs (DVA) for service-related conditions. In 2014-15, the cost of these services was \$5.525 billion.¹⁶ If the cost was borne (and funded) by Defence rather than DVA, it would constitute 15.9 per cent of a recalculated Defence budget, compared to around 9.5 per cent of GDP in health costs for the entire Australian population.¹⁷

A striking characteristic of ADF service therefore pertains to the high treatment cost of service-related medical conditions (even for personnel with peacetime-only service), despite high recruiting and retention health standards.

Furthermore, 'Gulf War syndrome', depleted uranium exposure, mild traumatic brain injury, post-traumatic stress disorder, traumatic amputations and military suicide have dominated the attention of political and military leaders, veterans' groups and the media over the last 25 years in Australia and elsewhere.¹⁸ Many of these injuries have become the 'signature wounds' of multiple conflicts in which Australia and its allies have participated in recent decades.¹⁹

However, these conditions have also diverted attention from lower profile yet often preventable

diseases and non-battle injuries. For example, of the 62,087 US military medical evacuations from the Middle East area of operations in the ten years from October 2001, 81 per cent were not for 'signature wounds' but for diseases and non-battle injuries, about half of which were 'musculoskeletal injuries, mental disorders and ill-defined conditions'.²⁰

Occupational and environmental physicians in Australia

In 2014, the Australian health care system had 98,807 medical practitioners in more than 80 specialties, including 32,050 general practitioners and 55,792 other specialists.²¹ The Royal Australasian College of Physicians represented 19,210 Australian specialist and trainee specialist doctors from 33 specialties in various divisions, chapters and faculties.²² Pertinently, the College's Australasian Faculty of Occupational and Environmental Medicine represented 492 physicians and trainees who:

[P]rovide specialist knowledge to ensure a healthy, productive workforce and connect a workplace with the diverse range of health services necessary to optimise the health and wellbeing of employees. [Occupational and environmental physicians] work with governments, regulators, employers, workers and other health professionals to ensure positive health outcomes for workers and employers.²³

Its website defines the terms 'occupational' and 'environmental' medicine as:

'Occupational medicine' takes a preventative approach to health and safety in the workplace by looking at how a work environment can affect a person's health, and how a person's health can affect their work.

'Environmental medicine' is primarily concerned with the human health impacts of industrial practices on the broader environment outside of the industrial site.

The Faculty has maintained an interest in the health care of current and ex-serving ADF members since its inception in 1982. This is demonstrated by the high proportion of its members with extensive military and other experience of working with the ADF and/or DVA. Indeed, two of its last five presidents have previous ADF service.

Occupational and environmental physicians are also specialists in setting the pace and

direction of workplace-based rehabilitation, and negotiating with employers and other stakeholders to achieve optimal return-to-work outcomes.²⁴ Their skills and expertise are therefore highly relevant not only for current and ex-serving ADF members but also ADF supervisors, commanders and personnel managers, as well as DVA.

The current state of occupational and environmental health in the ADF

Although the Defence Work Health and Safety Branch and the Services have reasonably robust occupational and environmental safety organisations, their occupational and environmental health capabilities are quite limited. For example, as of August 2016, the ADF had only one uniformed occupational and environmental physician, the Defence Work Health and Safety Branch had one such civilian physician, and Joint Health Command had one vacant civilian position. Among other limitations, this precludes the ADF from effectively putting the 'health' into 'work health and safety'.

Moreover, the ADF appears unique in that, unlike other employers, its health services provide employee health care without ascertaining whether or not their clinical presentations are work-related. For example, Joint Health Command clinical records routinely document patient details such as their Service and rank but not their rate (Navy), corps (Army) or mustering (Air Force), which indicate the jobs they perform.

Furthermore, Joint Health Command does not collect or report work-related illness/injury data, or record lost time or restricted duties, or identify the ensuing health care costs (albeit some of this information is provided via a separate non-health reporting process managed by the Defence Work Health and Safety Branch). Yet this baseline health information is essential, not only for monitoring the effectiveness of the ADF's occupational and environmental health services but also accounting for the health care costs incurred by Joint Health Command, as well as the compensation and veteran health care costs incurred by DVA.

Moreover, Joint Health Command does not include occupational and environmental physicians as part of its multidisciplinary rehabilitation teams, despite anecdotal evidence

that 30-40 per cent of clinical presentations to a typical ADF medical practitioner are for generally preventable musculoskeletal injuries. About half of these are workplace-related (typically related to manual handling or slips/trips/falls); the other half tend to be sports-related.

Also anecdotally, another 30-40 per cent of clinical presentations are for generally preventable mental health injuries. About half of these members lack psychological robustness for whom the ADF has been a poor career choice; the other half tend to be members who are psychologically robust but are not coping with excessively demanding or otherwise dysfunctional ADF workplaces or personnel management practices. This means that only the remaining 20-40 per cent of ADF clinical presentations are for conditions typically seen in an equivalent Australian civilian population.

These assertions are supported by data from the ADF's Health Surveillance System (EpiTrack), which showed that in 2007-08 and 2008-09, the five most common medical conditions in the ADF were injuries and musculoskeletal disorders, respiratory tract conditions, skin conditions, ill-defined conditions, and ear, nose and throat disorders, while the five most common ADF conditions resulting in sick leave were injuries and musculoskeletal disorders, respiratory tract conditions, mental health disorders, stress reactions, ill-defined conditions, and intestinal infectious disease.²⁵

By comparison, the five most common Australian civilian clinical presentations in 2013 were hypertension, (childhood) immunisations, upper respiratory tract infections, (non-work-related) depression, and diabetes.²⁶ Consistent with the relationship between battle- and disease/non-battle injury casualty rates throughout military history, it is evident that the overwhelming majority of ADF clinical presentations are not combat-related.²⁷

It is also the case that the non-deployed/garrison health services provided by Joint Health Command do not reflect an occupational and environmental health paradigm. Joint Health Command provides these health services in accordance with the extant Service Level Agreement between the Vice-Chief of the Defence Force and the single-Service Chiefs. Although the Defence Minister can vary the treatment services provided by Joint Health

Command (in order to maintain fitness for duty while reflecting the facilities available), the agreements to date otherwise only mandate compliance with the *Health Insurance Act 1973* and the *National Health Act 1953*, which ensures that ADF personnel receive the same level of non-deployed health care as Australian civilians.²⁸

However, although the current Service Level Agreements refer to occupational and environmental health services, none have so far required garrison health services to facilitate local unit compliance with the *Work Health and Safety Act 2011*. This limitation, combined with a lack of military occupational and environmental physicians, restricts garrison rehabilitation and other clinical services to that provided by general practitioners and other non-specialist practitioners.

The lack of occupational and environmental health support provided by Joint Health Command is not counterbalanced by that provided by the Defence Work Health and Safety Branch. The latter's focus on higher-profile workplace exposures such as asbestos, fuel, diesel exhaust fumes, surface finishes and fire-fighting foam does not address the lower profile yet far higher volume (and cost) of preventable workplace-related musculoskeletal and mental health injuries being treated by garrison health staff.

The need for a revised health delivery model

High workplace illness and injury rates suggest the need to better manage the occupational hazards associated with all ADF workplaces (whether deployed or non-deployed), in particular emphasising prevention rather than treatment. The earlier definition of occupational medicine indicates that this entails occupational and environmental physicians and other health practitioners who can specifically consider, in the first instance, 'how workplaces affect employee health'.

To this end, Derek Licina and colleagues have referred positively to a Joint Health Command concept paper, prepared for the Defence Work Health and Safety Committee, which outlined options to support Defence's 'Occupational Medicine/Occupational Hygiene Project'.²⁹ However, Licina *et al* also describe how some related capability shortfalls remain outstanding, despite these having been raised

in 2009 by Comcare during its investigation into hazardous substances in ADF and Defence workplaces, while others were identified at the 2001 Board of Inquiry into chemical exposure by workers involved in the maintenance of F-111 fuel tanks.³⁰

There is also the need for occupational and environmental physicians, and other health practitioners, to consider 'how employee health affects their ability to work'. For the ADF, this means ensuring that commanders, managers and supervisors are adequately informed of the health status of their personnel, in particular whether their medical condition(s) limits or prevents them from working and, vice-versa—that is, whether their work makes their medical condition(s) worse.

The inappropriate employment of medically-unsuitable personnel poses a potential threat both to the individual and their unit's mission.³¹ Evacuating personnel with known pre-existing conditions also wastes assets and poses operational hazards to other personnel. All clinical ADF health staff therefore must consider medical suitability for employment and deployment at all patient presentations. All actions arising should comply with the 'Temporarily Medically Unfit' process, the ADF Medical Employment Classification system and the relevant single-Service references.³² Anecdotal evidence suggests this takes up to 30-40 per cent of an average military general practitioner's total workload.

However, garrison medical officers cannot assess medical suitability without fully understanding the jobs their patients perform in the ADF workplace. Acquiring this understanding typically takes 12 months; part-timers take longer, and sessional general practitioners are unable to acquire it without prior service experience.

This assertion is supported by studies indicating that medical fitness-for-work certification can be challenging for civilian general practitioners because of a combination of confidentiality issues inherent to the doctor-patient relationship; the general practitioner's patient advocacy role; consultation time pressures; a lack of occupational health expertise; and a lack of knowledge of the workplace.³³

Other studies indicate that some civilian general practitioners do not accept their

responsibilities as to how they should manage long-term work absence, work disability and unemployment.³⁴ Furthermore, balancing the needs of commanders against those of their patients can pose ethical dilemmas for health staff. Civilian health practitioners may also be required to default to the latter position by their professional registration authorities.³⁵

In summary, although assessing health suitability for employment and deployment is clearly an occupational and environmental health function, it is not recognised as such with respect to the fundamental inputs to capability for either Joint Health Command's garrison health services, or for the Defence Work Health and Safety Branch.

Although the ADF's deployable environmental health services are reasonably robust, media articles indicate significant preventive management shortfalls for ADF environmental hazards in the base setting.³⁶ The Australasian Faculty of Occupational and Environmental Medicine's website indicates that in collaboration with other occupational and environmental health professionals, garrison occupational and environmental physicians can proactively help limit the health impacts of ADF industrial practices on nearby civilian communities and the broader environment.

Conclusion

ADF personnel are arguably exposed to the most diverse range of occupational and environmental hazards of any Australian workforce. Controlling these hazards is complicated by the number, size and complexity of the ADF's workplaces, and its workforce demographics.

Workplace hazards significantly affect the physical and mental health of ADF personnel. High rates of preventable workplace illness and injury suggest the need to better manage the occupational and environmental hazards associated with all deployed and non-deployed ADF workplaces, with increased emphasis on prevention rather than treatment.

It therefore seems reasonable that the ADF's health services should reflect a paradigm premised on the Australasian Faculty of Occupational and Environmental Medicine's definitions of occupational and environmental medicine. Among its other attributes, the resulting health care delivery model would

include military and civilian occupational and environmental physicians, who not only can perform occupational and environmental health policy and other roles but also provide workforce rehabilitation and other clinical primary health care services alongside general practitioners, in both the garrison and operational settings.

However, the current state of the ADF's occupational and environmental health services, and the small number of civilian specialist practitioners within the Australasian Faculty of Occupational and Environmental Medicine, suggests that a mature health delivery model would take 10-15 years' sustained effort with respect to occupational and environmental physicians alone.³⁷

This suggests an urgent need to reassess the fundamental inputs to capability for Joint Health Command and the Defence Work Health and Safety Branch. The reassessment should facilitate inputs to capability that reflect an occupational and environmental health paradigm, leading to a genuinely holistic and sustainable workforce-based ADF health service delivery model by 2030.

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Disclaimer

The views expressed in this article are the author's,

and do not necessarily reflect those of the RAN, the Australasian Faculty of Occupational and Environmental Medicine, or any of the other organisations mentioned.

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Volume	No	Issue Date	Submission Deadline	Advertising Deadline
April 2017 – Disaster Relief and Humanitarian Assistance				
25	2	April 2017	1 January 2017	1 March 2017
July 2017 – Mental and Social Well-being				
25	3	July 2017	1 April 2017	1 June 2017
October 2017 – Surgical Innovations in Military Medicine and Conference Abstracts				
25	4	October 2017	As per AMMA Conference Submission Process	1 September 2017

The Editor would be delighted to receive articles for consideration on these themes. However, please note that although these are the suggested themes, we encourage authors to continue to submit articles on a range of topics on military medicine and veterans' health including operational articles.

Categories for the above include: Original Research/Original Articles, Short Communication, Review Articles, Reprinted Articles, Case Studies, Abstracts from the Literature, Biographies, History, Book Reviews, Commentary and View from the Front.

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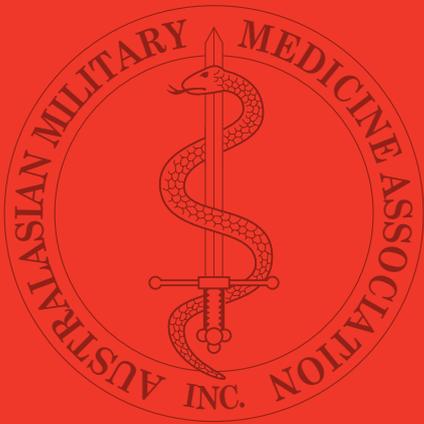


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